PUBLISHERS OF LAW BOOKS
PRINTERS AND BOOKBINDERS
The Carswell Company
LIMITED
145-149 ADELAIDE STREET WEST
TORONTO CANADA

Digitized by the Internet Archive
in 2014

https://archive.org/details/contractrecordv25p02

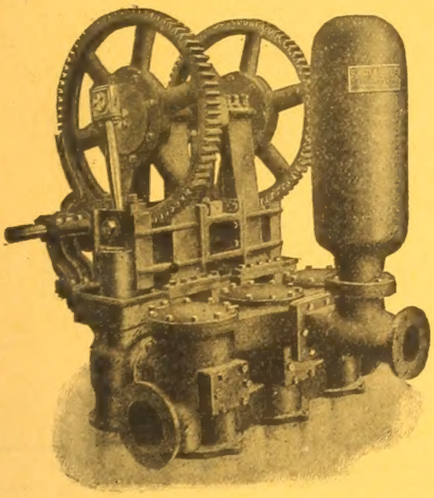
Vol. 25 Toronto, May 3, 1911 No. 18

ESTABLISHED 1886

Contract Record

2783-8

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information



We
Manufacture
Steam and
Power
Pumps
Condensers
Travelling
Cranes
etc.

WRITE FOR CATALOGUE

The Smart-Turner Machine Company Limited
HAMILTON, ONTARIO

"MADE IN CANADA"

Bent Glass

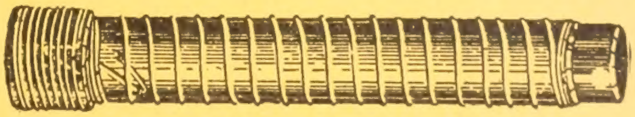
Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works : Don Speedway
Bending Works : 209-213 Victoria Street, TORONTO

There's a Good HAND HAMMER DRILL Illustrated on PAGE 27

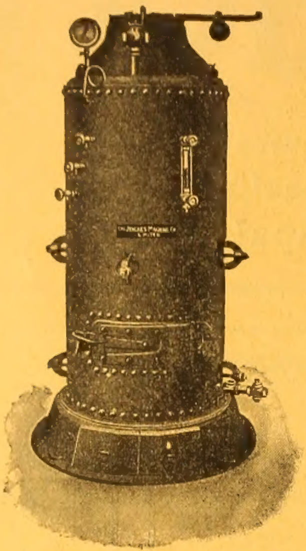
CANADIAN RAND CO., LIMITED
Commercial Union Building, MONTREAL, QUE.



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS
for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

BOILERS

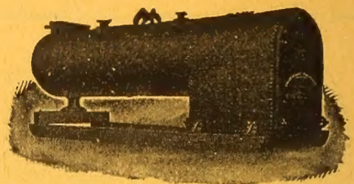


Horizontal Tubular, Vertical Tubular and Locomotive types for medium or high pressures, also Marine and special Boilers.

Many sizes in stock, others under construction.

We can make prompt shipments at any time.

Our catalogue on request.



The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, Montreal, St. Catharines, Cobalt, Rossland and Vancouver

---

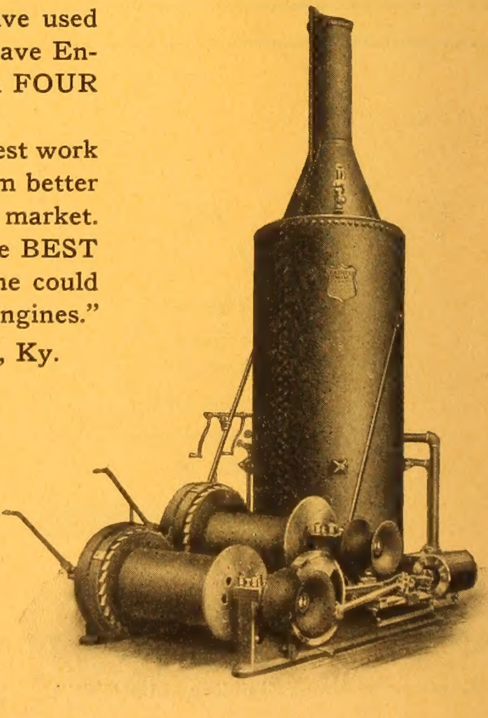
NOTE THE TONE OF THIS LETTER

"For the two 'AMERICAN' Engines which we have used for six years, we have paid very little for repairs. We have Engines of other makes on which the repair bills have been FOUR TIMES what we spent on the 'AMERICANS.'

We use these two engines for Pile Driving (the hardest work an engine is called upon to do), because we consider them better adapted to this kind of work than any other engine on the market.

The several 'AMERICAN' Derricks we have are the BEST WE HAVE EVER USED, and do not see how any one could make a mistake in buying 'AMERICAN' Derricks or Engines."

LANGHORNE & ALLEN, Oneonta, Ky.



THERE IS UNMISTAKABLE ENTHUSIASM AND SINCERITY IN THIS LETTER FROM CONTRACTORS WHO RANK HIGH IN THEIR PROFESSION

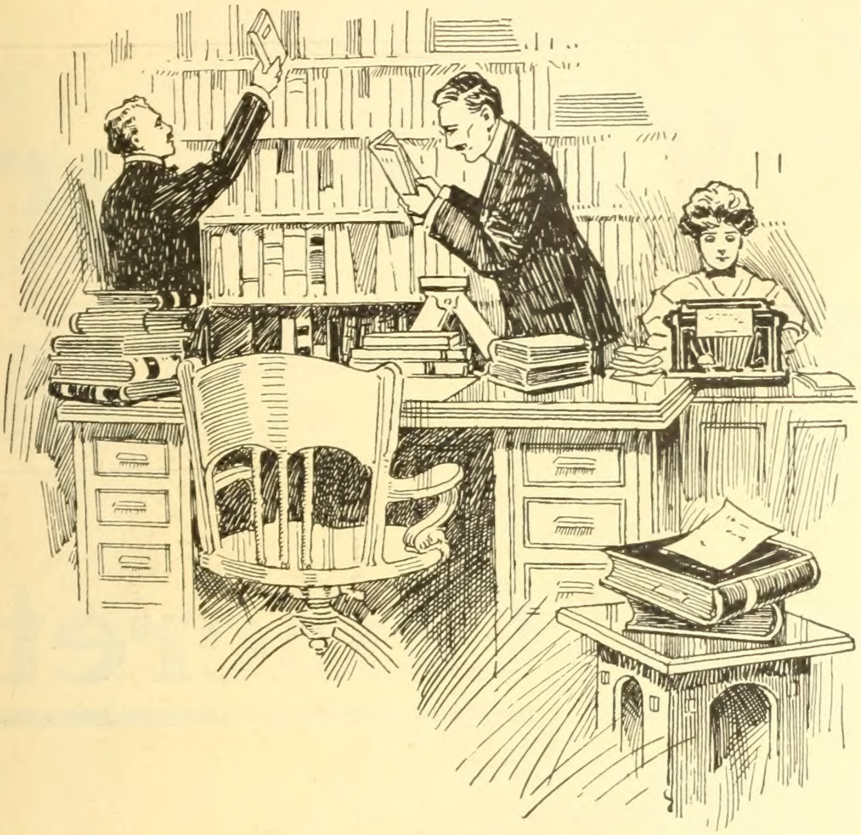
May we send you prices and information on "American" Machinery?

AMERICAN HOIST AND DERRICK CO.

ST. PAUL, U.S.A.

AUTHORIZED AGENTS—

Gorman, Clancey & Grindley, Edmonton and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot, Ltd., Vancouver, B.C.
J. L. Neilson & Co., 602, Main Street, Winnipeg, Man.
Dunn Brothers, Winnipeg, Man.
J. A. McTaggart, Winnipeg, Man.

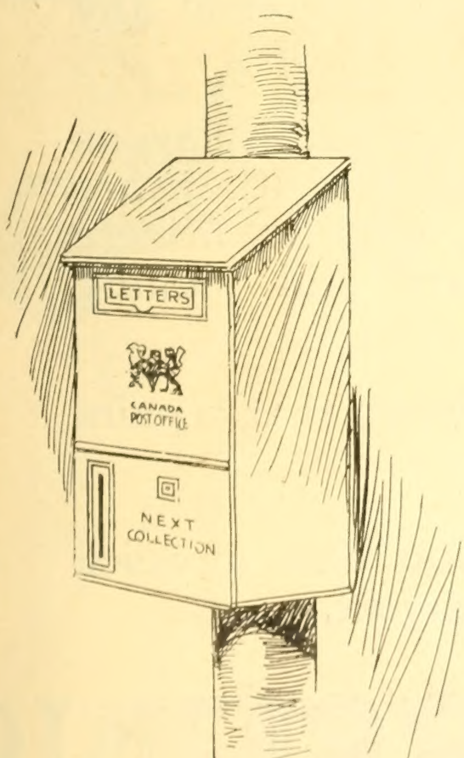


It is perhaps not generally known

that we have an Information Department consisting of trained and practical men, whose time is employed solely in answering enquiries from people interested in cement.

Now it will be readily understood

that out of the mass of enquiries that come to us, there are a number that include questions as to what might be termed Allied Industries. These we now answer to the best of our ability, but we could answer them still more satisfactorily, if manufacturers of materials used in conjunction with cement would co-operate to the extent of sending copies of their catalogues and other literature to be placed on file in our office for reference.



We should like to obtain

the names and addresses, together with catalogues, and any other obtainable information of manufacturers of and dealers in:

1. **Concrete Machinery**
2. **Building Blocks**
3. **Cement Bricks**
4. **Tile Molds**
5. **Fence Posts**
6. **Re-inforcing Material**
7. **Water-proofing Compounds**

It is not alone for our own convenience that we make this suggestion ; firms who manufacture or deal in such articles will find it to their own advantage to have this information in the hands of our Information Department, thereby enabling us to hand on to them from time to time enquiries for such materials as they severally make.

In sending catalogues, literature or information, please address same to "Sales Department."

The——

Canada Cement Company

Limited,

Banque National Building - - - MONTREAL

Good Value for Your Money

This is what you get when you buy

The Smith Concrete Mixer

THEY will mix quicker and better than any other machine.

We build them ourselves and are particular as to what they are made of and how they are made. As a result we have Smith Mixers supplied 8 years ago which are still making concrete.

Experience and records have shown that repairs on a "Smith" are lightest of any.

All this means "Economy" for you and a quick return on your investment.

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

Buy The

SMITH MIXER

over 5,000 sold

The Machine That is

Always on the Job

and

Never Known to Fail

Send for Catalogues on Mixers built in any style for any power.

Concrete Barrows, Carts, Cars, Elevators, Etc.

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Crown Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work Page

Canadian Wire Goods Mfg. Co. 68
Dennis Wire & Iron Works 87
Meadows Co., Geo. B. 31

Air Compressors

Escher Wyss & Co 72

Air Valves, Automatic

Marsh, J. P. 84

Asphalt Plant

East Iron Machine Co. 77

Buckets

American Hoist & Derrick Co. 2
Sackett Screen & Shute Co 69

Belting

Federal Engineering & Supplies, Ltd 72

Blowers

Sturtevant Co., B. F. 29

Boilers

Case Threshing Machine Co. 81
Inglis, John 61
Jenckes Machine Co 2
Leonard & Sons, E 73
Marsh & Henthorn 66
Mussens Limited 4
Waterous Engine Works Co. 83

Brick Machinery and Supplies

Berg Mfg. Co. .....
Wert C. S. .....
Whitehead, John .....

Brick

American Enamelled Brick Co. 64
Don Valley Brick Works 7
Hamilton Pressed Brick Co 77
Milton Pressed Brick Co .....
Port Credit Pressed Brick Co. 82
Toronto Pressed Brick Co. .....

Brickmaker's Supplies

Sackett Screen & Shute Co 69

Bridges (Steel)

Attica Bridge Co. 21
Canadian Bridge Co 89
Cleveland Bridge Co. 89
Dickson Bridge Works 89
Dominion Bridge Co 89
Hunter Bridge and Boiler Works 74
Phoenix Bridge and Iron Works 85
Pennsylvania Steel Co. 84

Cement

Alsen Portland Cement Co 70
Britnell & Co 70
Bremner, Alex 87
Canada Cement Co 3
McNally & Co., W. 85
Morrison & Co., T. A. 88
Rogers, Alfred Limited 9

Concrete Pipe

Dominion Concrete Co. 22
Lock Joint Pipe Co. .....

Cement Waterproofing

Ceresit Waterproofing Co. 31

Cranes, Travelling & Locomotive

American Hoist & Derrick Co. 2
Armstrong, H. J. 69
Brown Hoisting Machinery Co. 83

Conduits Page

Conduits Co., Limited 87

Concrete Mixers and Machinery

Canada Foundry Co 17
Cropp Concrete Machinery Co. 84
Famous Block Machine Co. .....
Gould Shapley & Muir 16
Hopkins & Co., F. H 92
Jenckes Machine Co 2
London Concrete Machinery Co. 31
Milwaukee Mixer Co. 16
Mussens Limited 4
Morrison & Co., T. A 88
Vining Bros. .....
Wettlaufer Bros. 10

Contractors' Plant

American Hoist & Derrick Co. 2
Acme Eqpt. & Engineering Co. 75
Beatty & Sons, M. 6
Hepburn, John T. 12
H. & E. Lifting Jack Co 71
Hopkins & Co., F. H 92
International Marine Signal Co 8
Meaford Wheelbarrow Co. .....
Marsh & Henthorn 66
Montreal Locomotive Works 81
Mussens Limited 4
Oshkosh Logging Tool Co. 26
Ritchie Contractors Supply Co. 91
Tiffin Wagon Co. 72

Crushers (Stone and Rock)

Berg Machinery Co .....
Allis-Chalmers-Bullock 63
Case Threshing Machine Co. 81
Hopkins & Co., F. H. 92
Jenckes Machine Co 2
Mussens Limited 4
Morrison & Co., T. A. 88

Corrugated Iron

Galt Art Metal Co .....
Metallic Roofing Co 65
Metal Shingle and Siding Co 23
Ormsby, A. B., Limited 11
Roofers Supply Co 83

Contractors

Alburty Co. 83
Bennett, Robt. .....
Holmes, Fred. 69
McIlwraith, Jas. A 88
Nadel & Adler 88
Wells & Gray 26

Coal Handling Apparatus

American Hoist & Derrick Co. 2
Down Draft Furnace Co. 75

Derricks and Derrick Fittings

American Hoist & Derrick Co. 2

Drills

Beatty & Sons M 6
Canadian Rand Co. 27

Drilling Contractors

Harvey, J. 89

Dredges

Beatty & Sons, M 6

Dry Kilns Page

Sturtevant Co., B. F. 29

Electrical Apparatus, Motors

Allis-Chalmers-Bnllock, Ltd 63
Canada Ford Co. .....

Engines

Case Threshing Machine Co. 81
Canadian Boving Co. .....
Inglis, John 61
Jenckes Machine Co 2
Leonard & Sons, E 73
Mussens Limited 4
Sturtevant Co., B. F. 29
Waterous Engine Works Co 83

Engineers (Civil) and Mechanical

Barber & Young 88
Chipman & Power 88
Bowman & Connor 88
Farmer, John T. 88
Fuce, Edw. O. 88
Galt Engineering Co., John 88
Glaubitz, H. J. 88
Hancock, H. Syd. 88
Hunt & Co., Robt. W. 88
Inglis, John 61
Kennedy, Jas. C. 88
Lea & Ferguson 88
Mace, T. Harry 88
Mitchell, C. H. 88
McRae, John B 88
Moore & Scollan 88
Taylor, James 88

Exhaust Heads

Sturtevant Co., B. F. 29

Filters

American Water Softener Co. 73

Friction Clutches

Berg Machinery Co .....

Field Instruments

Gurley, W. & L. E. 63

Fire Brick

Gibb, Alexander 79

Fire Apparatus

Morrison & Co, T. A. 88
Seagrave, W. E. 80

Fireproof Doors and Windows

Douglas Bros 18
Mussens Limited 4
Ormsby, A. B. 11

Gauges, Steam, etc.

Marsh, Jas. P. 80

Granite and Marble

Laurentian Granite Co 89
Missisquoi Marble Co 79
Smith Marble & Construction Co. 68

Glass Page

Chance Brothers & Co. 78
Consolidated Plate Glass Co. .....
Luxfer Prism Co. .....
Thompson & Co., B. & S. H. 78
Toronto Plate Glass Importing Co. 1

Heating Apparatus

Jenckes Machine Co. 2
Leonard & Sons, E. 73

Hoisting Machinery

American Hoist & Derrick Co. 2
Allis-Chalmers-Bullock 63
American Hoist & Derrick Co. 2
Beatty & Sons, M. 6
Canada Ford Co. .....
Inglis, John 61
Jenckes Machine Co. 2
Hopkins & Co., F. H. 92
London Gas Power Co. 91
Marsh & Henthorn 66
Mussens Limited 4
Sturtevant Co., B. F. 29

High Pressure Pipe Lines

Escher Wyss & Co 72

Hydrants

Canada Iron Corporation 87
Gartshore-Thomson Pipe Co. 86
Kerr Engine Co. .....

Interior Finish and Doors

nglin, S. 70
Batts Limited .....
Canada Office & School Furnitur. Co
DeLaplante, Ltd. 79
Bryan Mfg. Co. 65
Eaton & Sons, J. R. 79
Georgian Bay Shook Mills 66
Rhodes Curry & Co. .....
Sanitary Floor Co. 66
Tillson Co. 29
Wilson Bros. .....

Lime

Christie, Henderson & Co. 80
Jamieson Lime Co 67
Standard White Lime Co 75

Metal Lath

Galt Art Metal .....
Metallic Roofing Co. 65
Noble C. W. 78

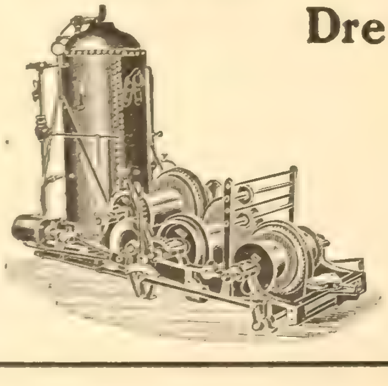
Meters

Hopkins & Co., F. H. 92
Neptune Meter Co. 65

Paving and Paving Materials

Dominion Carbolineum Works .....
Metropolitan Paving Brick Co. 24
Ontario Asphalt Block Co. 66
Shawmut Paving Brick Co. 69
Silica Barytic Stone Co. of Ontario 89

(Continued on page 10)



M. Beatty & Sons, Limited **Welland, Ontario, Canada**

Dredges - Ditchers - Derricks

Steam Shovels

Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

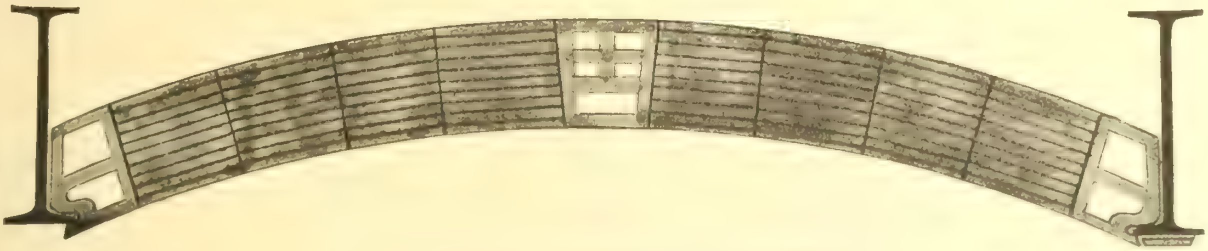
Don Valley Bricks

and Porous Terra Cotta Fireproofing

suited for every purpose of fireproof construction.

Column Covering
Arches

Furring
Blocks



T. C. Fire Proofing of Quality

DON VALLEY

- Pressed Brick
- Vitrified Brick
- Enamelled Brick
- Wire-Cut Brick
- Porous Terra Cotta Brick

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO
Montreal Agent: David McGill, 206 Merchants Bank Chambers

SIMPLE PERFECT

CLEAN WATER

For MANUFACTURERS or MUNICIPALITIES

Can be obtained by using the

"TORRENT" or "PULSOMETER"

FILTER

Complete information furnished on request

International Marine Signal Company Limited

OTTAWA, CANADA

GRAVITY PRESSURE

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Page
[illegible] Mfg. Co.	21
[illegible] & Co.	8[illegible]
[illegible], H. W.	80

Pipe

American Spiral Pipe Works	7[illegible]
Canadian [illegible] Pipe Co.	8[illegible]
Dominion Wood Pipe Co.	1[illegible]
Dominion [illegible] Co.	22
Gartshore-Thomson Pipe Co.	86
Lock Joint Pipe Co.	
[illegible] & Co.	11
National Iron Works	87
Pacific Coast Pipe Co.	1
Pedlar People	[illegible]

Plumbers' Supplies

Standard Ideal Co.	[illegible]

Power Engines

Inglis Co., John	61

Paints and Varnishes

[illegible] Varnish Co.	32
International Varnish Co.	74
Paterson Mfg. Co.	60

Pile Driving Machinery

American Hoist & Derrick Co.	2
[illegible] Construction Co.	82

Pumps and Pumping Machinery

Allis-Chalmers-Bullock	63
American Well Works	
Beatty & Sons, M.	6
Escher Wyss & Co.	72
Goulds Pump Co.	
Hopkins & Co., F. H.	92
Inglis Co., John	61
Leonard & Sons, E.	73
Martin Pump and Machine Co.	69
Mussens Limited	4
Ontario Wind Engine & Pump Co.	82
Smart-Turner Machine Co.	1
Waterous Engine Works Co	83

Roofing Contractors

	Page
Schwoerer & Sons, A.	

Roofing Materials

Asbestos Mfg. Co.	25
Bird & Son, F. W.	
Galt Art Metal Co.	
Metallic Roofing Co.	61
Metal Shingle & Siding Co.	23
Noble, Clarence W	74
Paterson Mfg. Co.	86
Philip Carey Co	87
Roofers Supply Co	87
Standard Paint Co.	30

Railway Supplies

Gartshore, John J.	89
Hopkins & Co., F. H.	92
Mussens Limited	4

Reinforcements, Concrete and Steel

Ambursen Hydraulic Construct'n Co.	89
Canada Wire Goods Mfg. Co.	68
Concrete Form Engine Co.	65
Steel & Radiation	19
Trussed Concrete Steel Co.	74
Turner, C. A. P.	

Road Machinery

Case Threshing Machine Co.	91
Hamilton Machinery Co.	15
Morrison & Co., T. A	88
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co	17
Hopkins & Co., F. H.	92
Mussens Limited	4

Stone

	Page
Britnell & Co.	80
Brodie, Jas.	
Christie, Henderson & Co.	80
Consolidated Stone Co.	
Contractors' Supply Co	80
Corinthian Stone Co	76
Crushed Stone, Limited	73
Doolittle & Wilcox	66
Hagersville Contracting Co.	71
Laurentian Granite Co.	88
McMillan & Son, R.	71
Morrison & Co., T. A.	88
Myers, Oakley	73
Roman Stone Co	
Sackville Freestone Co.	8
Sand & Supplies	70
Thames Quarry Co.	82

Steam Apparatus

Sturtevant Co., B. F.	29

Submarine Diver

Rouleau, Joseph N.	89

Structural Iron and Steel

Buffalo Steel Co.	71
Dominion Bridge Co.	84
Steel Co. of Canada	23
MacKinnon Holmes & Co.	85
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	89
Salter, W. H.	85
Steel & Radiation	19

Sewer Pipe

Britnell & Co	80
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
Gartshore Thomson Pipe Co	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	
National Iron Works	87
Ontario Sewer Pipe Co.	21
Standard Drain Pipe Co.	21

Stationary and Power Engines

Case Threshing Machine Co	81

Slate

Roofers Supply Co.	87

Steel Shingles and Ceilings

Galt Art Metal Co.	

Smoke Stacks

Leonard & Son, E.	73

Tents

Woods Limited	81

Safes and Vaults

Taylor, J & J	

Stone Saws

	Page
Anderson, Geo.	18

Tiles

Smith Marble & Construction Co.	68

Tanks and Stand Pipes

Berg Machinery Co.	
Inglis, John	61
Jenckes Machine Co.	2
Leonard & Sons, E.	73
Marsh & Henthorn	66
Ontario Wind Engine & Pump Co.	82

Trade Journals

Castellanos, A. W.	82

Valves

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co.	86
Kerr Engine Co.	
Marsh & Co., Jas.	80
Standard Fitting & Valve Co.	80

Ventilating and Heating Apparatus

Gardiner & Gaskill	68
Sturtevant Co., B. F.	29

Water Softeners and Filters

Berg Machinery Co.	
American Wafer Softener	73

Wire Rope

Greening Wire Co., B.	
Smith, Thos. & Wm.	13

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	68
Crescent Wire Iron Works	81
Sackett Screen & Shute Co	69

Water Wheels

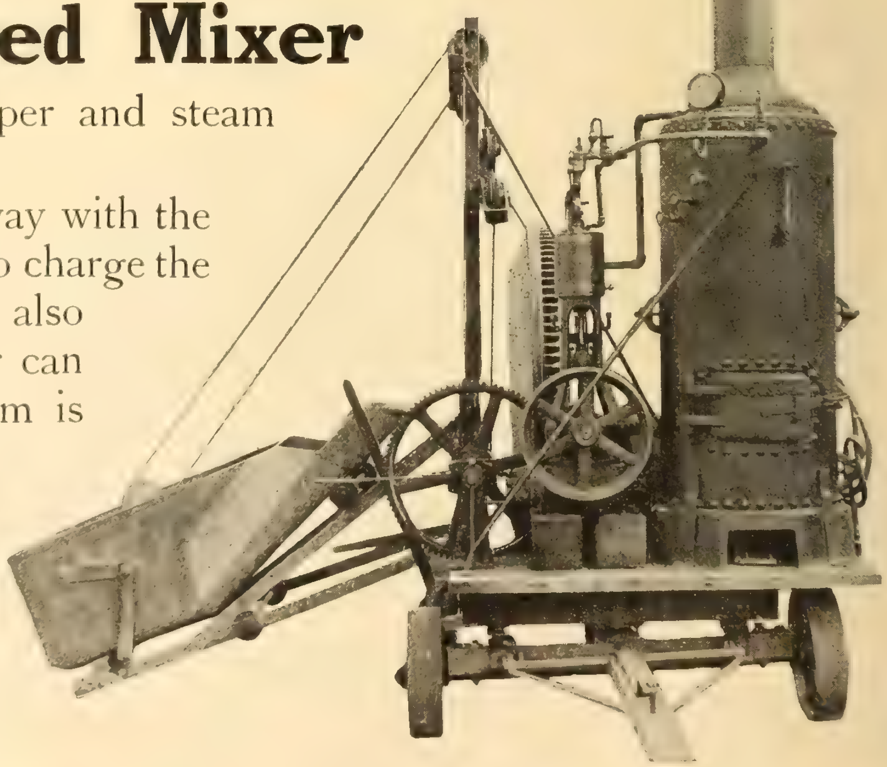
Allis-Chalmers-Bullock	63
Canadian Boving Co.	

Water Turbines

Allis-Chalmers-Bullock	63
Escher Wyss & Co.	72

Wheelbarrows

Sackett Screen & Shute Co.	69



Improved Half-Yard Heart-Shaped Mixer

with automatic-lift hopper and steam power.

The hopper does away with the building of a platform to charge the mixer drum, and it also means that the hopper can be filled while the drum is mixing.

Send For Our Catalogue

Wettlaufer Bros.
178 Spadina Ave., TORONTO

A. R. Williams Machinery Company
15 Dock St., St. John, N. B.

W. E. Ransome, Moosejaw, Sask.

MODERN.

→ ESTABLISHED 1861. ←

MUNDERLOH & Co. Ld.

Sole Agents in CANADA for

MANNESMANN SEAMLESS STEEL PIPES

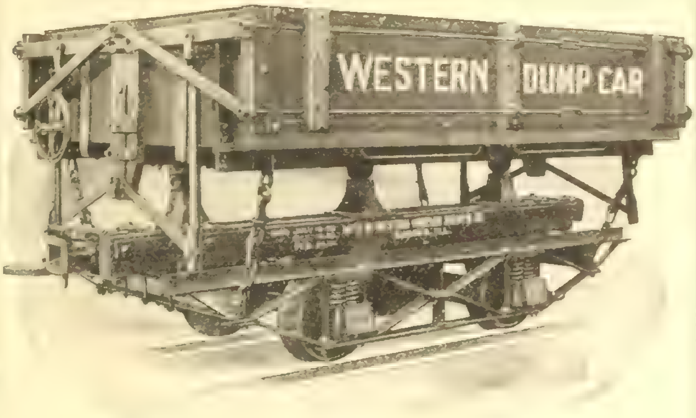
FOR GAS & WATER MAINS

AN IMPROVEMENT ON CAST IRON MAINS.

51 VICTORIA SQUARE, MONTREAL.

MADE UP TO 40 FEET IN LENGTH.

STRONGER. CHEAPER. RELIABLE



THE

Proved Quality Dump Car

The unequaled **practical** experience back of Western Dump Cars combined with their **sturdy** construction and the fact that they have always led in improvement is the reason for their matchless reputation for **quality** and **efficiency**—they are as good as greatest skill can make them.

The Western Four Yard Car

is ideal size for 3-ft. gauge. It is unbeatable in design and construction—ample capacity for heavy loads, yet of low, compact form, with bed and truck separable, steep dumping angle and automatic pivoted side boards. It is dependable in **any** service.

Sizes and styles of Dump Cars for every purpose are described in our general catalog of earth and stone-handling machinery.

Western Wheeled Scraper Co.

Earth and Stone Handling Machinery **Aurora, Ill.**

You're A Busy Man

That's one of the reasons why we made this Catalogue so complete. The illustrations in every instance are from photographs, you see **just what we give you.** We guarantee you that if **ORMSBY 'UNDERWRITERS' Fire-proof Doors are specified** you will be relieved of all worry and bother. Your client gets the benefit when our goods are specified. We give you **real** service.

A. B. Ormsby, Limited

Experts in Fireproof Windows and Doors

Factories : TORONTO and WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

JOHN SCHMELL, Pres. D. MACKENZIE, Vice-Pres. F. A. SHAND, Man.-Dir. W. H. WILSON, Sec.-Treas.

The Dominion Wood Pipe Co., Limited

NEW WESTMINSTER, B. C.

Invites Correspondence Regarding

Wood Stave Water Pipe

and Wooden

Water Tanks

Cast Iron Specials, Valves, Hydrants etc.

Have you any use for a Derrick?

There are large plans under way. Large contracts are being placed. In all directions there is bustle and activity. Everything points to an unusually busy season for construction work of all kinds. But what about equipment?

John T. Hepburn

Scotch Derricks

are in use by all leading contractors in all parts of the country. They are designed and built for hard work, combining safety and high efficiency, with low operating cost. Being made in standard sizes, any part can be replaced at short notice. They may be operated by hand or power—are fitted with single and double purchase gears—powerful band brake—and safety locking device that prevents boom from falling.

We are busy now. We shall be busier in two or three weeks
Better place your order to-day to secure early delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

THOS. & WM. SMITH, LD.,

WIRE ROPE MANUFACTURERS,

NEWCASTLE-ON-TYNE, ENGLAND.

ELECTRIC CABLEWAY OVER THE ZAMBESI RIVER AT THE VICTORIA FALLS.
Span, 870 feet. Working Load [illegible] Main Cable [illegible] Breaking Strain of Main Cable [illegible]
Main Cable supplied by Thos. & Wm. Smith Ltd., Newcastle-on-Tyne.

HIGH-CLASS WIRE ROPES

For CONTRACTORS' WORK, such as BLONDINS, CRANES, INCLINES, BALLAST ROPES, &c., &c., and all classes of work requiring Wire Ropes

AGENTS IN CANADA

EVANS, COLEMAN & EVANS, Ltd., Vancouver.
ANGEL ENGINEERING & SUPPLY CO. Ltd., St. John's, N.F.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg.
BAINES & PECKOVER, Toronto

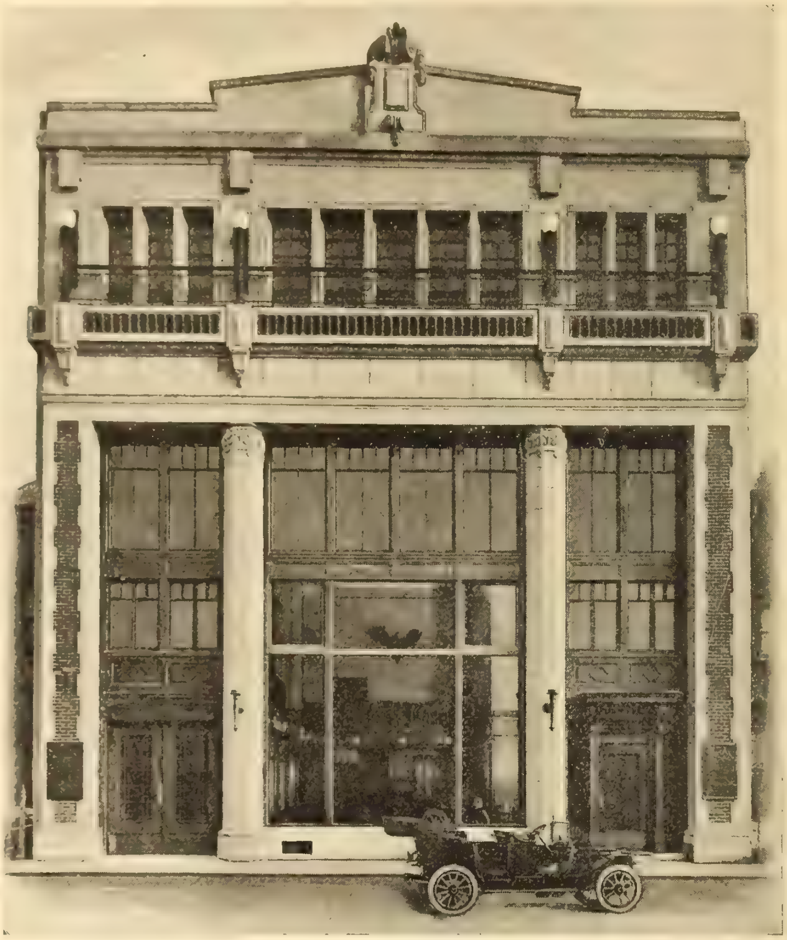
REPRESENTATIVE FOR CANADA

D. W. CLARK, P.O. Box 521 TORONTO, ONTARIO.

USE ONLY SMITH'S "RED THREAD" WIRE ROPES.

Roman Stone

(Trade Mark Registered)



Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company Limited

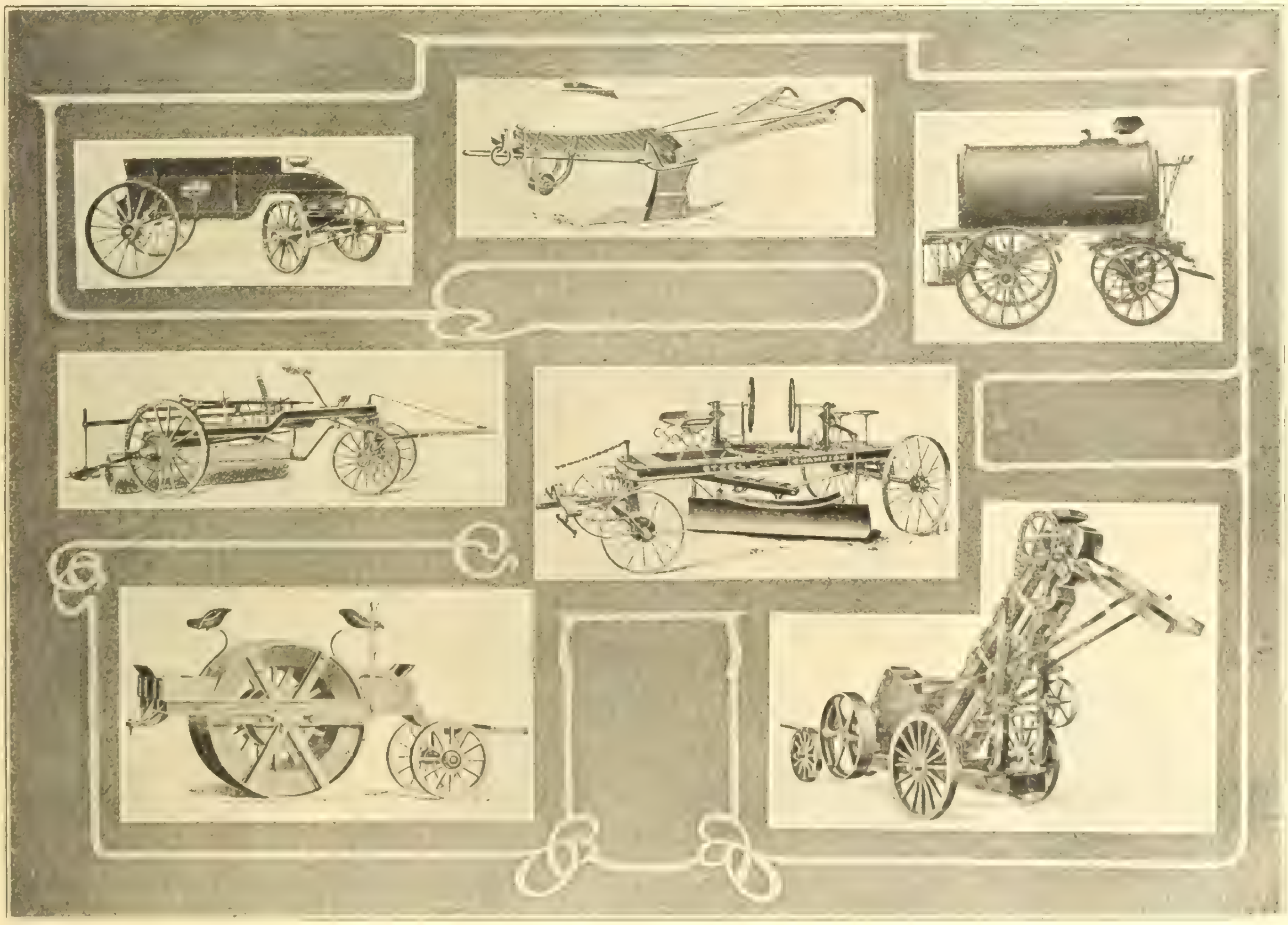
Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi, 26 Sparks St., Ottawa	A. L. Bedson, Canada Life Bldg., Winnipeg	T. A. Morrison & Co., 204 St. James St., Montreal

"CHAMPION"

in name--"CHAMPION" in record

"CHAMPION" Road Machinery has features not found in any other make. Study this Cut



We make practically everything needed in road machinery, but every machine turned out is as carefully designed and constructed as if it was the only one built. Send for descriptive literature and prices. Standard in Canada for 20 years.

MANUFACTURED BY

The American Road Machine Company of Canada, Limited, Goderich, Ont.

Address correspondence to

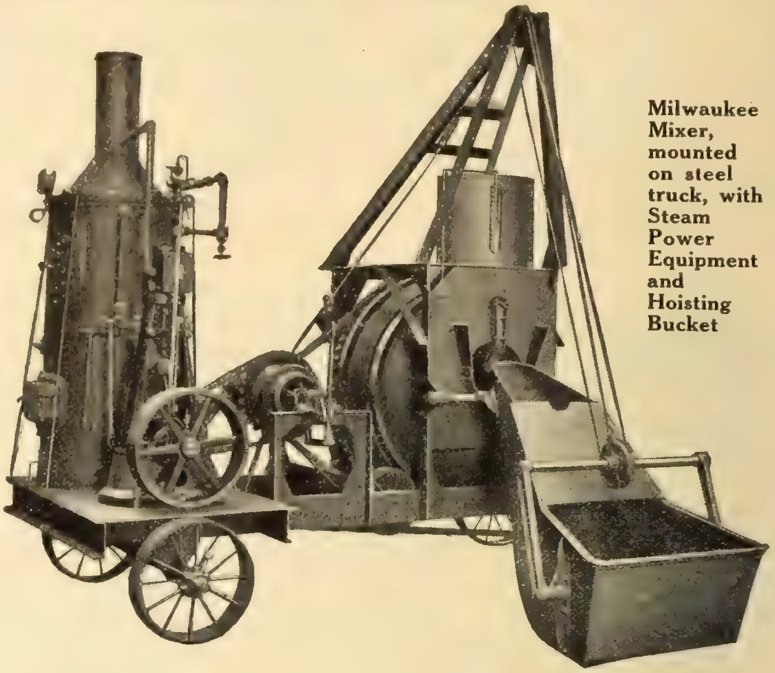
The Hamilton Machinery Company, Ltd.

Hamilton, Ont.

Sole Agents for the above Company.

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

We will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

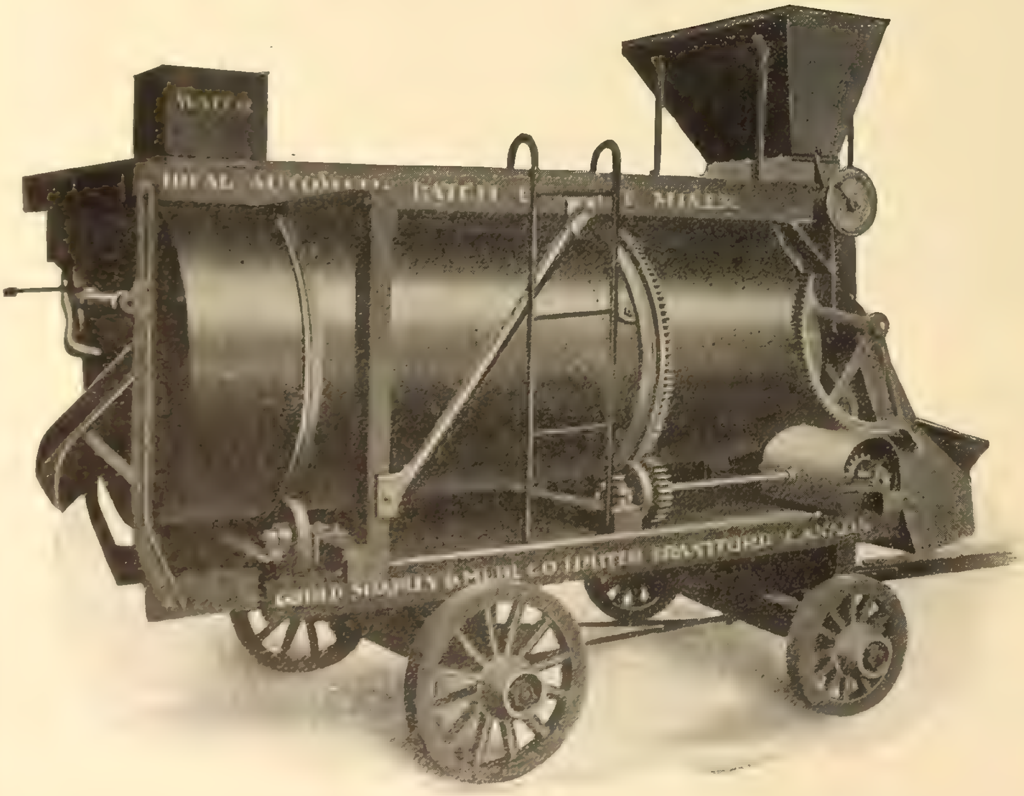
No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

Milwaukee Concrete Mixer and Machinery Co. - **Milwaukee, Wis., U. S. A.**

CANADIAN REPRESENTATIVES:

The Stuart Machiney Co., Winnipeg, Man. **C. W. Stancliffe & Co.,** Vancouver, B.C.

CONCRETE MIXERS


WATER
IDEAL AUTOMATIC BATCH ... MIXER
GOOLD SHAPLEY & MUIR CO. LIMITED BRANTFORD CANADA

Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

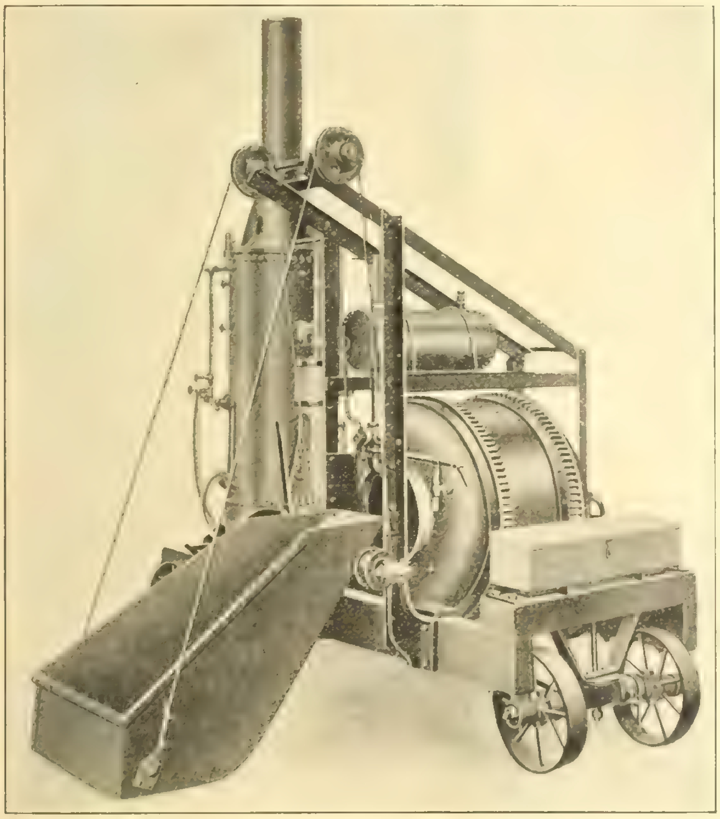
Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
**GOOLD SHAPLEY
& MUIR CO. LTD.**
Brantford, Canada

Better Concrete for Less Money



Concrete Mixer theories grow into definite mixing knowledge when every mixing action is a known positive mechanical force.

There's an individuality about Koehring Mixing—it's known mixing.

The drum is a plain cylinder with heavy cast iron heads, but bear in mind, it's made without deflecting faces or other obstructions, to limit the end-to-end mixing.

The mixing blades are so arranged that they not only lift and pour the aggregates from the side but carry them alternately from end-to-end and break them over against the heavy heads.

There's no guess work about it—no rolling over in the centre of the drum, every action of the aggregates is performed by a known positive mechanical force.

But there's another mixing than this in the Koehring Mixer.

When not in discharge position, the inner end of the discharge chute is tilted downward.

Material carried up by the mixing scoop at the side is discharged into the inwardly and downwardly extending chute and decends from the inner end in a continuous flow, the entire width of the chute, and falls to the bottom at right angles to that from the mixing scoops and the end-to-end mixing.

That's three independent mixings, everyone of them a known mixing and no theories required to explain them.

Three known mixings in one, is why the Koehring Mixer is the fastest in existence.

But known mixing is not its only improvement over old style batch mixers.

The trunnion rollers are cast with wide flat faces, chilled to extreme hardness, and placed wide apart at the extreme ends of the drum. This not only guarantees a stable equilibrium to the drum, but insures its maintaining perfect alignment even after years of service. The outer end of the discharge chute does not tilt backwards, affording ample clearance for wheelbarrows, even in the smallest sizes. There are other worth considering features that every mechanical mind knows are correct in principle, explained in our new catalogue.

Do not fail to write for it at once.

Canada Foundry Company

Limited

Head Office and Works: TORONTO

District Offices:

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Circular Diamond Saws

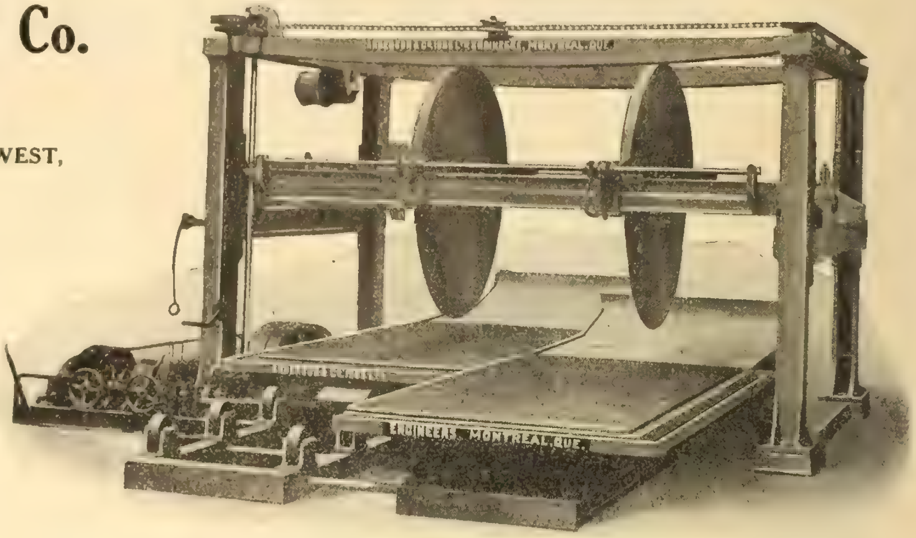
For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICES & WORKS
London, England, 82 Victoria St., S.W.
Newark, N.J., U.S.A. 420-422 Ogden St.
Montreal Works, 157 Craig St. West
Head Works, Carnoustie, Scotland

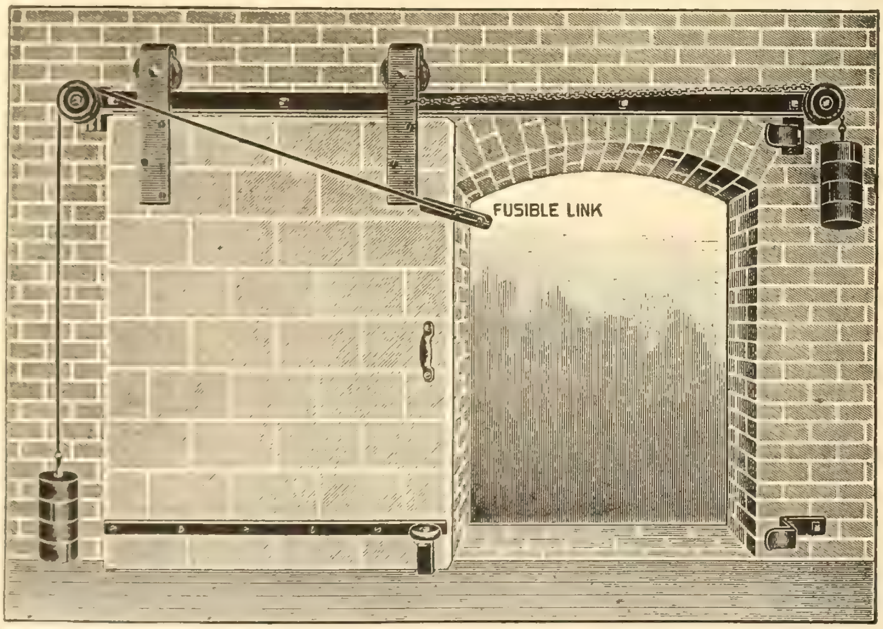
MAKERS OF

Gangs, Planers, Marble Dressers, Derricks, and Electric Traveling Cranes up to 50 tons, Quarry Machinery, Gas Engines and Producer Plants.
10 H. P. to 150 H. P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 **SINGLE AND DOUBLE TABLES**

About 50 of the above Machines at work in Canada



Fireproof Doors and Windows

We are specialists in this particular line and can solve your most difficult problems.

Estimates furnished on complete work or any part.

Have you our Literature?

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

STEEL AND RADIATION LIMITED

Here are
FOUR POINTS OF SUPERIORITY
in our new

"KING" BOILER

That will appeal to every one interested in the house heating problem.

1. The **"King"** Grate is supported in its socket in the cored base, which does away with grate ring, and it is impossible to shake it from its sockets. Any section can be taken out through the door very quickly, there being no Bolts, Pins or Nuts to remove.
2. The **"King"** Fire Pot is widely corrugated, increasing the area exposed to the heat and insures complete combustion of the fuel around the outside edge.
3. The **"King"** Thin Flat Waterways situated directly over the fire, absorb the intense heat quickly and thus promote very rapid circulation. This means fuel economy.
4. The **"King"** Boiler is absolutely guaranteed to have the capacity equal to catalogue ratings.

Exhaustive tests of every section and of the completed boiler are applied to every **King** Boiler – a Boiler that embodies every point of superiority in other boilers.

"King Radiators" used in conjunction with the

"King" Boiler

produce the most perfect heating system in the world. Actual requirements may be closely filled, as the **"King"** Boiler is being made in half sizes.

STEEL & RADIATION LIMITED

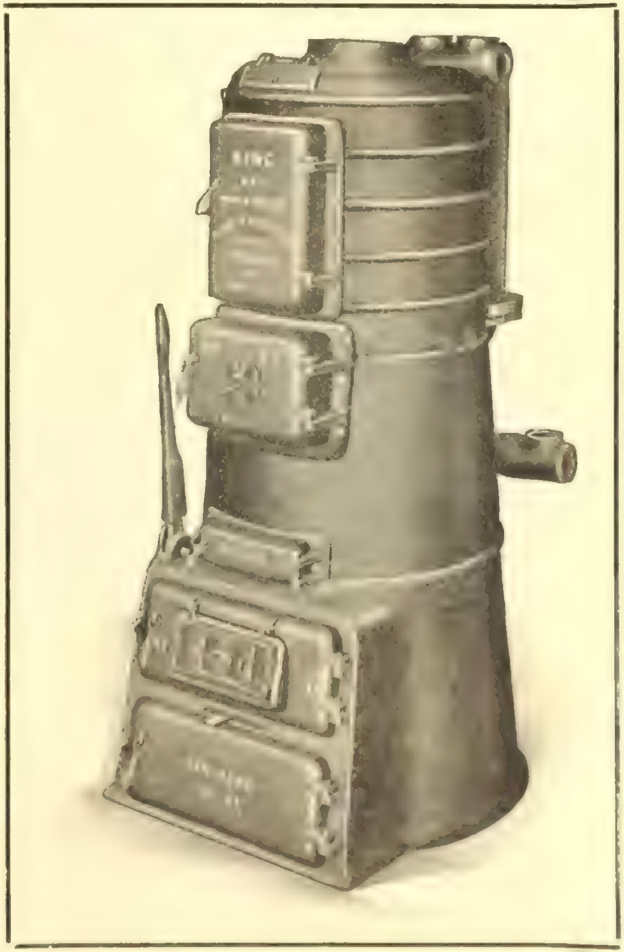
Fraser Avenue

TORONTO - CANADA

AGENTS

TORONTO SHOWROOMS
80 ADELAIDE ST. EAST
KING ST. WEST

MONTREAL SHOWROOMS AND
SALES OFFICE: 138 CRAIG ST. WEST
AGENCIES IN ALL LEADING CITIES



J. H. NEW, PRESIDENT RYLAND H. NEW, VICE-PRESIDENT

Unquestionably the Best Line in the Market

Over half a century of experience is at the back of the unsurpassed quality of our product.

Hamilton Vitrified Salt Glazed Sewer Pipe

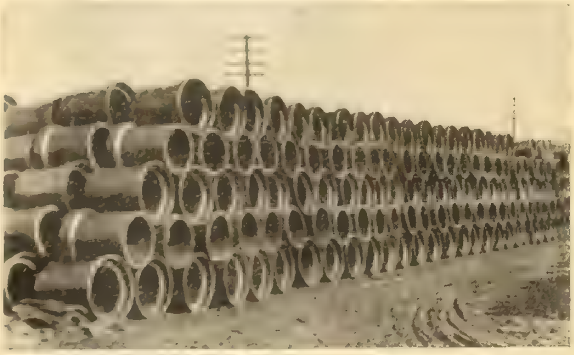
Is the one line that is bound to give supreme satisfaction. We have hundreds of satisfied customers all over Canada. Is it not worth while asking why?

We control the bulk of the business, because we deserve it.

The Hamilton & Toronto Sewer Pipe Co.
Limited
HAMILTON and TORONTO

We are not the Largest Manufacturers

The Row of Fame is a Row of VITRIFIED PIPE



18 inch Double Strength

We Have Many Rows Like This In MIMICO

Sizes 4 in. to 24 in. in any desired quantity

OF

SEWER PIPE

IN THE WORLD

and we have not been at it for Fifty Years either.

Look at our Pipe

and then tell us if it is necessary for us to make those boasts before we modestly admit that we hold first mortgage on the title of BEST.

ARE YOU FROM MISSOURI ?

Then we can produce to your satisfaction if you give us the opportunity.

MIMICO PIPE

may be equalled, we admit, but it's more than a day's journey to find a better.

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422, Evenings Park 3888 and 3889

Sewer and Culvert Pipes

We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The

Standard Drain Pipe Co.

of St. Johns, P. Q., Limited

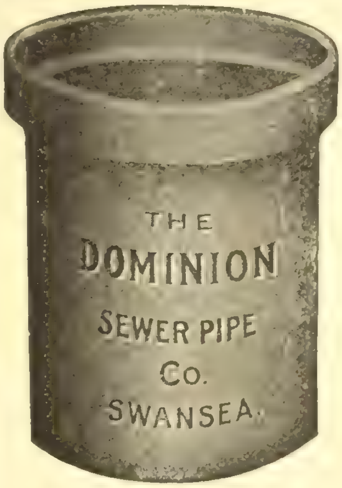
Factories at

St. John, P. Q. and New Glasgow, N. S.

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES



True to Size.

Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

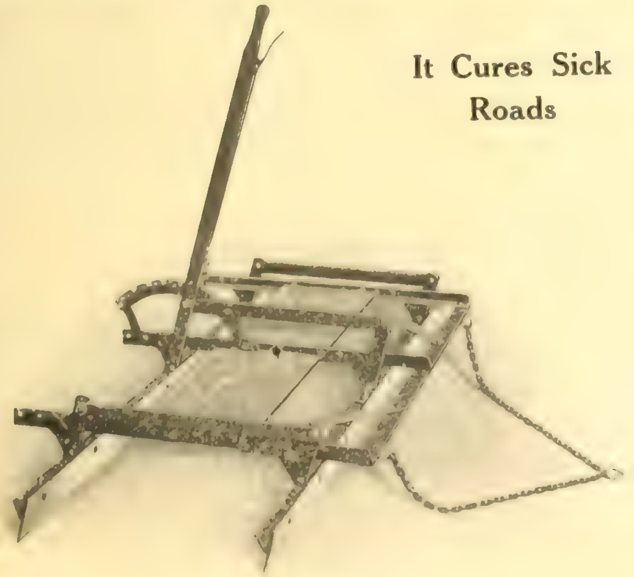
The Dominion Sewer Pipe Co.

(The Independent Co.) Limited

SWANSEA (near Toronto)

Abrico Road Drag No. 1

It Cures Sick Roads



Patented April 28, 1908

Length 8 feet. Width between blades 30 inches. Blades 6 inches. Weight 300 pounds.

Do you want nice smooth roads?

This Drag will take out all of the **bumps** and fill up all the **ruts.**

It is of steel construction and is adjustable, both forward and backward, and can be operated by one man and team.

Do not let distance keep you from having one.

Your order by mail will be given careful attention.

Manufactured by

Attica Bridge Company

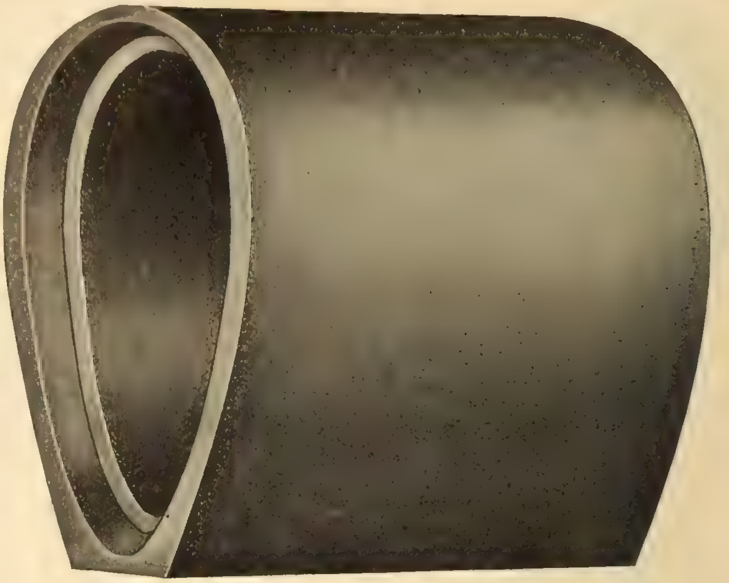
Attica, Indiana, U. S. A.

Canadian Representatives desired. Write for special terms.

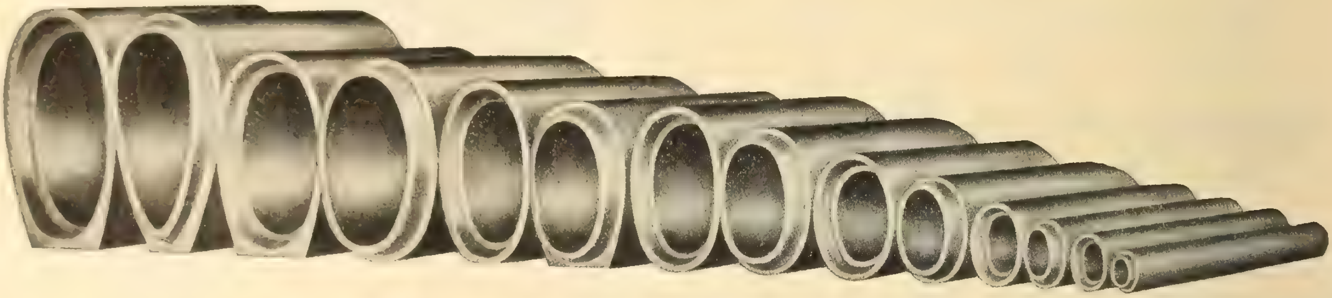
Municipal Engineers and Contractors

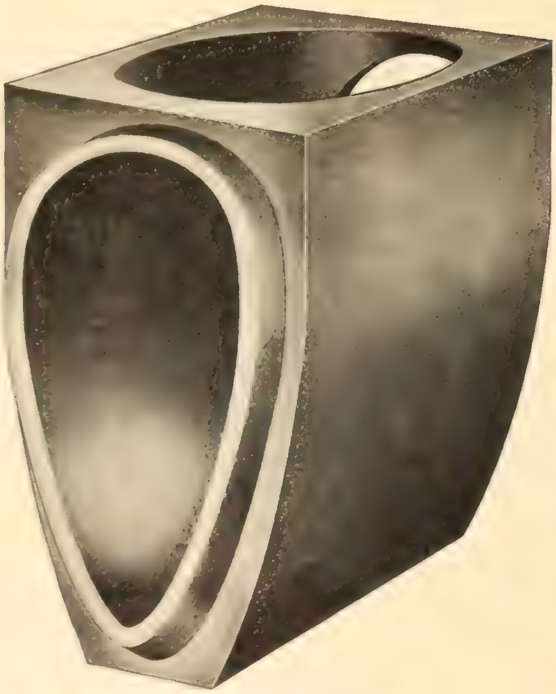
For **sewers** the only everlasting pipe is **concrete.** Builders do not use brick in foundations. Why? Because of the moisture. They do use concrete. Why? Because it is a proof against the destructive tendency of moisture. Why continue to use brick for sewers when a better material is now available at as low a cost?

In **Duluth** brick sewers failed after seven years so as to require replacement. **Concrete** sewers put in at the same time are **intact.** In **Millwaukee** after 25 years concrete pipe was found better than when new. Of 300 miles of sewers in **Millwaukee** over 200 miles are of **concrete.**



Section of 2' x 3' pipe





Man-hole Section of 2' x 3' pipe]

Concrete sewers abound in **England** and **Germany**. The modern **sewers** of **Paris** are all of **concrete**. American cities have adopted it. **Brooklyn** has hundreds of miles of it with not a single failure, whereas even Scotch vitrified pipe has been found to have deplorably failed there. **Toronto,** after much hesitation, is now in line with concrete. Why be the last to join the ranks you eventually will and must join ?

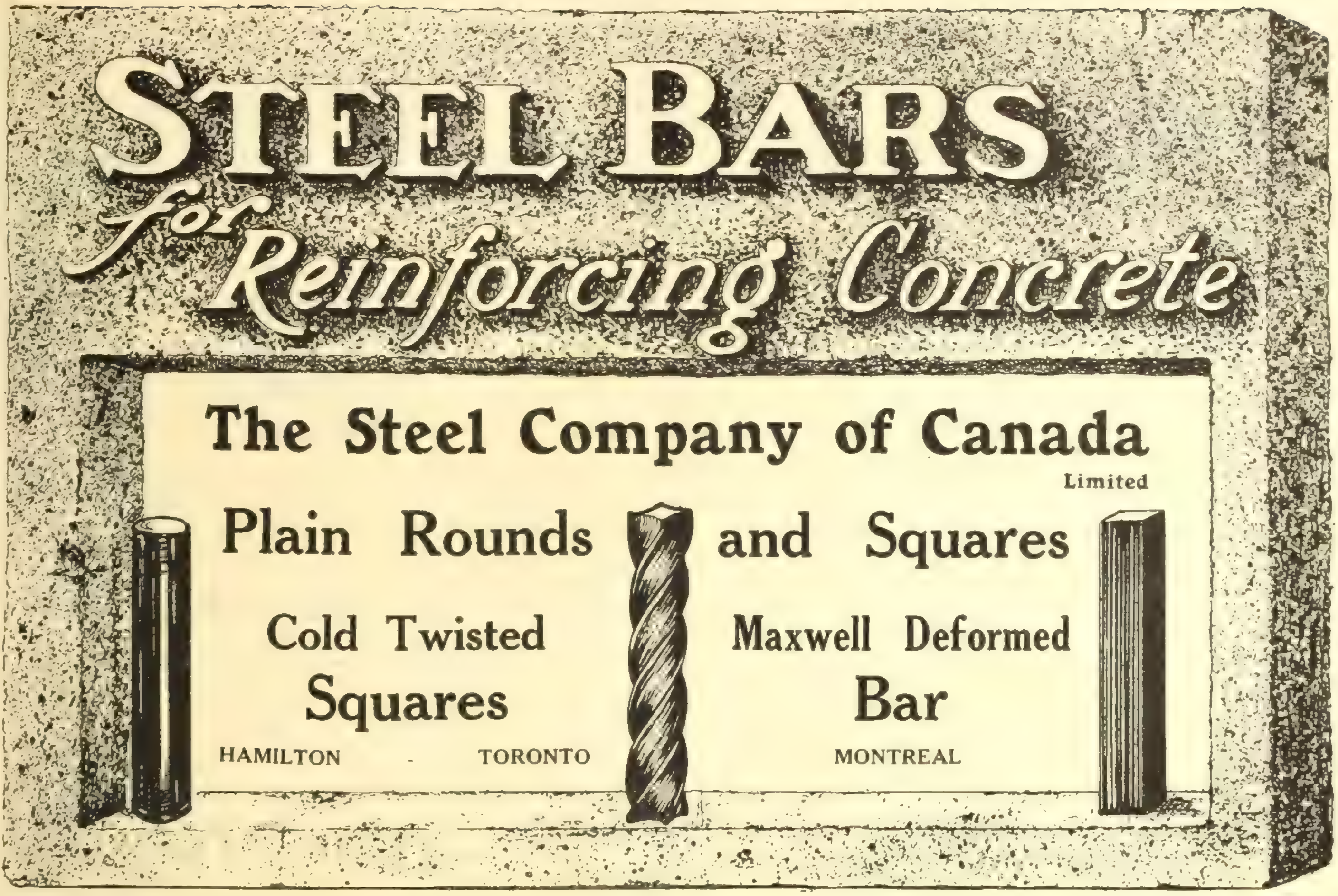
Our circular and egg-shapped sewer pipe are unsurpassed in quality, are more easily laid than flanged pipe, and give no trouble or ridiculous expense over man-holes or connections.

We have replaced vitrified pipe with concrete pipe and have found over 50 per cent of the vitrified unfit for re-laying. We carry a large and mature stock, we guarantee the quality, we take care of breakage in transit, and we solicit your patronage.

WRITE FOR CATALOGUE PRICE

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO



STEEL BARS *for Reinforcing Concrete*

The Steel Company of Canada
Limited

Plain Rounds and Squares

Cold Twisted Squares

Maxwell Deformed Bar

HAMILTON - TORONTO
MONTREAL

Make Good on Your Contract

If the specifications call for metal ceilings, make your customer more satisfied and add to your reputation by selecting Preston Steel Ceilings. Thus you will make good for sure on that part of the construction.

You should induce your customers to build or repair with metal ceilings rather than with plaster. For only a metal ceiling is fireproof and sanitary, as well as permanent.

In Preston Steel Ceilings the choice lies among over eleven hundred up-to-date designs. Each is deeply embossed, the patterns clear-cut, and the finish perfect.

Preston Steel Ceilings

Other building specialties we carry in immense stocks include Metal Shingles, Siding, Corrogated Sheets, Skylights, Ventilators, Finials, Herringbone Lath, Fireproof Windows, Canada and Terne Plate, Black Sheets, Copper and Galvanized Sheets, Gravel Roofing, Tinners' Supplies, etc., etc. Prompt shipment at all seasons.

Send for Pattern Book and Price Lists

Metal Shingle & Siding Co. Limited
Preston, Ontario

Building Permits

MARCH 1911

Vancouver	-	**$2.147.798**
Toronto	-	**2.210.770**

The West is booming. The East is busy too. The whole country is growing. Are you in constant touch with its development? We can give you advance authentic information concerning all BUILDING AND ENGINEERING PROJECTS, contemplated or in progress.

OUR SERVICE tells you about the proposed operation long before the other man knows. It enables you to select from the whole field those opportunities that promise the most profit and which you can handle to the best advantage.

This information is obtained by our own staff of reporters and correspondents, each of whom is assigned a definite territory. Reports are issued to our subscribers DAILY.

OUR SERVICE is a personal service designed to adjust itself, quickly and efficiently, to your individual requirements.

Ask us to tell you more about it.

MacLean Daily Reports

220 King St. West
TORONTO ONTARIO

"Hammer Brand"
Hard Wall Plaster

HARD-WALL PLASTER HAMMER BRAND HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.

Hillsborough, New Brunswick, Canada

Works Destroyed by Fire — Now Rebuilding

An Expert Engineer Said:

"You have in Ohio the Canton Shales. These make the very best Paving Brick in the world. Engineers have come to Ohio from all over the world—England, Germany, Spain—to examine this material and are trying to find something as good in their countries."

(Excerpt from Address about Street Pavements by J. W. Howard, C. E. E. M., of New York, before the Associated Organizations at the Business Men's Club, Cincinnati, Ohio, U.S.A., published March 30th, 1910, in "The Enquirer".)

"Best Paving Block Made"

Daily Capacity 500,000

Every time **"Metropolitan Block"** are adopted it is the initial proceeding for a permanent pavement.

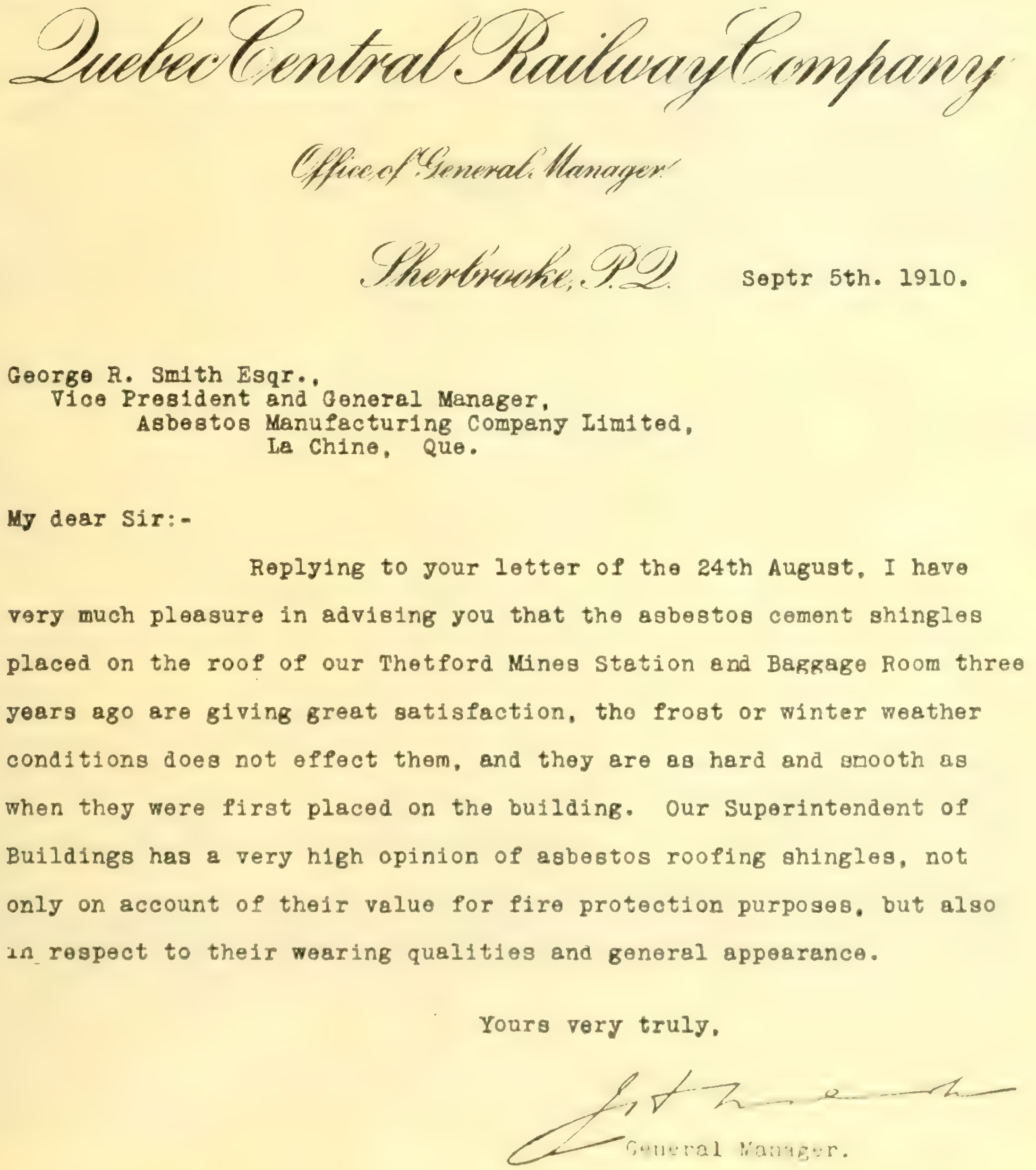
The Metropolitan Paving Brick Co.

Canton, Ohio, U.S.A.

Asbestos Cement Shingles

WHAT USERS THINK OF THEM

LETTER No. 2



Quebec Central Railway Company

Office of General Manager

Sherbrooke, P.Q. Septr 5th. 1910.

George R. Smith Esqr.,
Vice President and General Manager,
Asbestos Manufacturing Company Limited,
La Chine, Que.

My dear Sir:-

Replying to your letter of the 24th August, I have very much pleasure in advising you that the asbestos cement shingles placed on the roof of our Thetford Mines Station and Baggage Room three years ago are giving great satisfaction, the frost or winter weather conditions does not effect them, and they are as hard and smooth as when they were first placed on the building. Our Superintendent of Buildings has a very high opinion of asbestos roofing shingles, not only on account of their value for fire protection purposes, but also in respect to their wearing qualities and general appearance.

Yours very truly,

General Manager.

FIREPROOF, WATERPROOF AND EVERLASTING

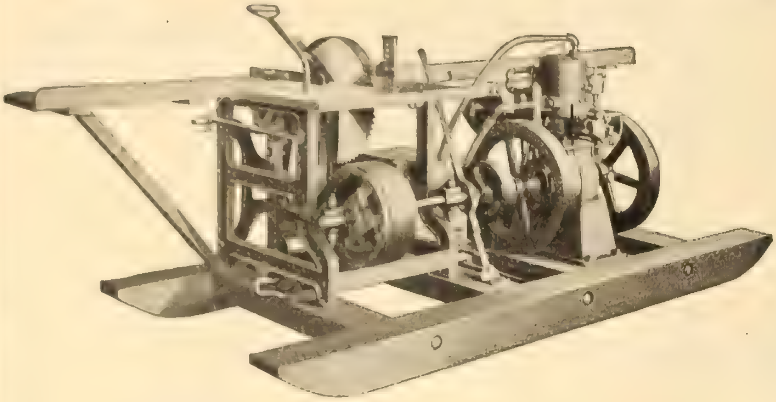
Write or Wire for Quotations

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P.Q.
Factory at Lachine, P.Q.

We manufacture Air Cell Pipe Covering, Asbestos Paper, Mill-board etc. in fact we make everything in the Asbestos Line

DON'T THROW AWAY Money IN TIME AND LABOR



Increase your profits and business by using the latest up-to-date machinery and methods.

Oshkosh Portable Saw Rigs

Will enable you to bid lower and Beat out your competitors.

Tear Off the Coupon and Mail To-day
Before your competitor gets ahead of you

Manufactured by
Oshkosh Logging Tool Company
OSHKOSH WIS.

OSHKOSH LOGGING TOOL COMPANY
Oshkosh, Wis.

Gentlemen
Kindly send me complete catalogue and prices of the Oshkosh Portable Saw Rig

Name ....

Town ....

State ....

C. P. R. Station at Guelph, Ont.

This building 56′ x 176′, one storey and basement, was commenced on Nov. 4, 1910. This photo was taken on Feb. 4, 1911. All foundations were carried to rock. Our work, which included everything from excavation to decorating, was completed on March 28, 1911.

WELLS & GRAY, LIMITED,
Engineers and Contractors
315 Confederation Life Bldg., - - TORONTO, ONT.

THE IMPERIAL

MB-13 PLUG DRILLER

OR

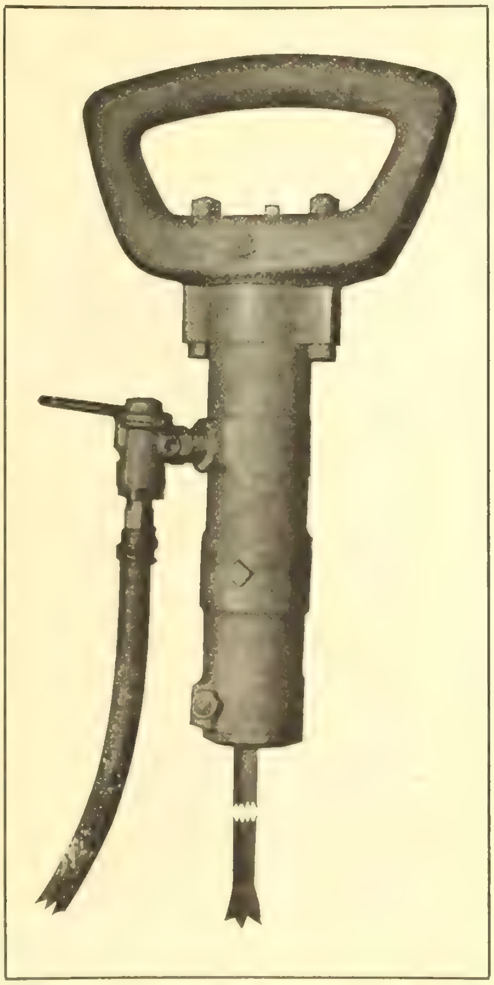
HAND HAMMER DRILL

A MEDIUM weight tool which embodies a great many of the best known principles of Hammer Drill construction, as applied to tools for this service.

The tool is designed for down holes only, yet it has a wide range of application. It has been found to be thoroughly adapted to all kinds of excavation work, particularly to trench excavation for sewers, gas and water mains; in sinking foundations, building bridge piers and in shaft sinking in a mine.

Although this tool has been on the market only a comparatively short time it has found great favor among the contractors and miners, with the result that there is a great demand for it.

The principle of the Hammer Drill is too well known to be explained here, but it's extreme simplicity, (only two moving parts) steady reliability and ease of upkeep should be given proper consideration by Contractors.



As it requires but a moment to change steels and as no setting up is necessary in changing holes; from seventy to ninety per cent. of the time paid for is applied in actual drilling, while with the ordinary piston drill a great deal of time is spent in these operations. This is an important feature where a number of shallow holes are required.

The great number of comparatively light blows of the hammer are much less destructive of steel than the heavier, less frequent, blows of the piston drills, therefore the breakage, dulling or loss of gauge is usually not more than half as great as with the heavy machines. This means a considerable saving in steel and in blacksmiths' costs.

The construction of the tool is of the Rand standard quality, which, we feel, is a sufficient guarantee of its excellence.

Any of the offices below will be glad to give you detailed information and prices.

CANADIAN RAND CO., LIMITED

Commercial Union Building, MONTREAL, CAN.

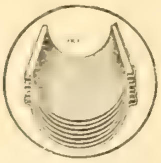
Toronto, Cobalt, Winnipeg, Lethbridge, Rossland, Vancouver, Halifax

PEDLAR NESTABLE CORRUGATED GALVANIZED CULVERT

Is the Strongest, Most Practical, Durable and Easiest Laid Culvert Made

YOU ought to show this advertisement to your township reeve or warden. Get him to write for the free book about Pedlar Culverts, or write for it yourself and tell him about this new Culvert—the quickest, most economical, strongest for any use any culvert can serve.

THESE culverts of mine are a great thing for the farming world. They not only make good roads possible, but they serve the farmer in many other ways. And they are so simply laid. They come nested like this.



This compactness saves freight and makes it easy to handle them. You put the sections together like this:

Then you clamp the flanges together like this:

And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

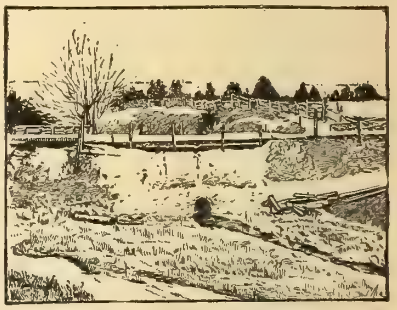
G. H. Pedlar

See How It Saves Farmers' Money, Betters Roads, Lowers Taxes

This picture is from a photo of a washout fourteen feet deep in the Township of Darlington, caused by use of cement tile for drainage purposes. The township authorities have replaced that with Pedlar Perfect Culvert, forty feet in length by three feet in diameter; strongest, easiest laid and most durable they could get.

This picture of the Pedlar Perfect Culvert assembled and ready to lower into place, shows the immense strength and rigidity of these Culverts. Though forty feet long with a bearing of only a few feet at the centre it does not give one-sixteenth of an inch. See how easily Pedlar Culvert can be lowered into place. No skill needed.

Here you see the Pedlar Culvert doing its work of drainage twenty-five minutes after being put in place. It would have taken three times as long and cost three times as much to have installed any other type of culvert. Yet this Pedlar Culvert will last far longer and give no further trouble of any kind.



This view shows the Pedlar Culvert after the fill-in was completed. The Culvert has to carry a dead weight of several hundred tons of earth, as well as the live weight of traffic passing overhead. But that can't strain Pedlar Culvert, which will neither give nor spring. It stands what no other Culvert can.

Write for My FREE Book No. "23" and Sample

and get a correct idea of what makes a good Culvert. Learn how Pedlar Culvert can be used on your farm.

The PEDLAR PEOPLE of Oshawa

411

Address nearest place

HALIFAX
16 Prince St.

ST. JOHN, N.B.
42 46 Prince Wm. St.

MONTREAL
321-3 Craig St. W

LONDON
86 King St.

OTTAWA
423 Sussex St.

TORONTO
111-3 Bay St.

CHATHAM
200 King St. W.

QUEBEC
127 Rue de Pond

REGINA
1901 Railway St. S.

WINNIPEG
76 Lombard St.

PORT ARTHUR
45 Cumberland St.

CALGARY
1112 First St. W.

VICTORIA
434 Kingston St.

VANCOUVER
821 Powell St.

We make

Chestnut Interior Trim

Prices and Quality Right

The Tillson Company Ltd.

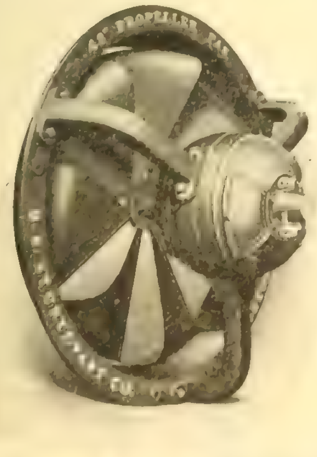
Woodworkers

TILLSONBURG
ONT.

THE REMEDY

FOR THAT HOT AND STIFLING ROOM IS A

Sturtevant Electric Propeller Fan



¶ They increase output, reduce sick leave, and raise efficiency of workers by keeping the air fresh and cool.

¶ Easily and cheaply installed, the first cost is small.

¶ The scientific design and construction of fan blades makes possible the moving of immense volumes of air at small expenditure of power.

¶ These fans are invaluable for use in workrooms, offices, kitchens, billiard halls, and in all places where heat, smoke or fumes are to be removed.

¶ Our engineering staff are always ready to make suggestions if you will inform us of the conditions to be met, the size of the room, etc.

B. F. STURTEVANT COMPANY

HYDE PARK, MASS.

Offices within calling distance from all large centers

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors, builders, etc.

For rates and other particulars, write

Western Canada Contractor

Commercial Travellers Building Winnipeg

RU-BER-OID ROOFING

Trade Mark Registered

Pronounce it RUE-BER-OID

The Question of Endurance generally gets first consideration in the selection of roofing. Look at the record of **RU-BER-OID** roofing.

The first **RU-BER-OID** roofs were laid twenty years ago—and they are still weather-proof. **RU-BER-OID** has seen service from the Equator to the Frigid Zone, under all extremes of temperature and weather. It has been tried on foundries, machine shops, even on nitric acid plants, and has proven conclusively that it is absolutely proof against the action of gases, fumes and acids.

The Question of Appearance

Besides the business-like slate, **RU-BER-OID** is made in beautiful soft shades of Red, Brown and Green. The color is impregnated into the body of the roofing and is therefore permanent.

Colored **RU-BER-OID** lends itself to the most attractive effects in buildings of the better class, particulary when laid in the new tile effect which we have devised.

The Cost of Laying

RU-BER-OID costs less to lay than any other good roofing. Skilled labor is not required, and because of the light weight of **RU-BER-OID** the framework and boarding of the roof need not be expensive.

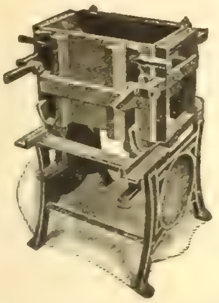
RU-BER-OID is being selected by prominent architects as the best covering for a concrete roof. It has been used for instance, on the Chateau Laurier—the magnificent new Grand Trunk Hotel at Ottawa.

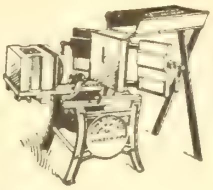
Write for full information on how to lay **RU-BER-OID** over concrete, and for full information on its many advantages.

The Standard Paint Co. of Canada, Limited

286 St. James St., Montreal
105 Tenth Ave. E. Calgary

179 Bannatyne Ave. E., Winnipeg
25 Pender Street Vancouver





London

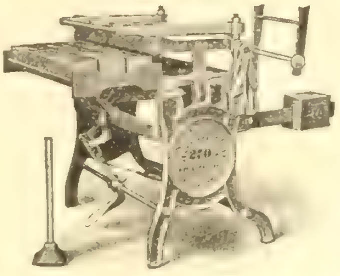
Face-Down
Adjustable

Concrete Block Machine

makes every kind, size and design of block. **All sizes of blocks made** in the **one adjustable mould. All sizes of blocks made** on the **one size pallet.**

Any size core desired can be used which is withdrawn vertically and thus allowing all blocks to be made by the wet process, or with crushed stone in the block. Machine fully **covered by patents.**

SEND FOR CATALOGUE.



London Cement Pressed Brick Machine

Hundreds in operation. Needs no recommend from us. The brick **have frog impression.** The only machine which makes a brick **polished on every side.** Our **self-racking pallet** does away with racks for curing which makes it possible for the contractor to manufacture the **brick on the ground** where the building is to be erected. One man operating makes 5000 brick per day.

Our catalogue tells all about it.

The London Adjustable Sill, Step and Window Cap Mould

Every Contractor and Manufacturer of Cement Products should know the class of goods that can be produced on this mold. **Can you afford to be without one?** Write for catalogue and learn what this mold will do.

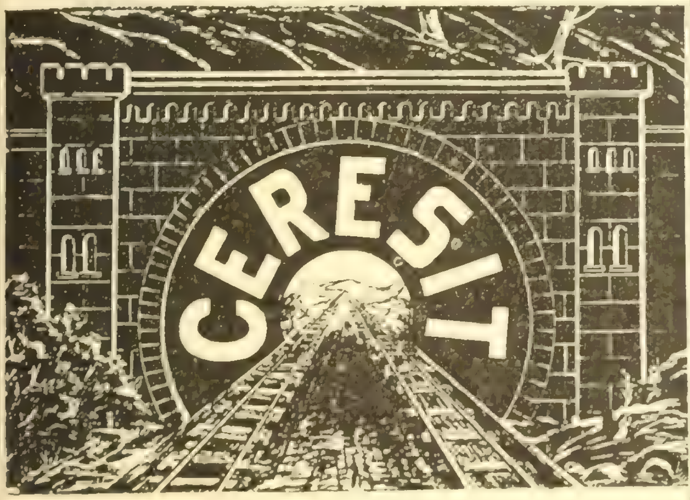
We also manufacture London Standard Drum Batch Mixers in five sizes, London Automatic Batch Concrete Mixers in two sizes, Cement Brick Machines, Face-Down Block Machines Power Drain Tile Machines, Hand Drain Tile Machines, Silo Curbs, Sewer Pipe Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

London Concrete Machinery Co., Ltd.

19 Marmora Street, London, Canada

We are the Largest Manufacturers of Concrete Machinery in Canada

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N. S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.



No Wet Cellars No Damp Basements

Ceresit is a cream white paste readily dissolvable in water. This water is used instead of plain water for mixing Cement, Mortar or Concrete.

Ceresit Waterproofing Co.

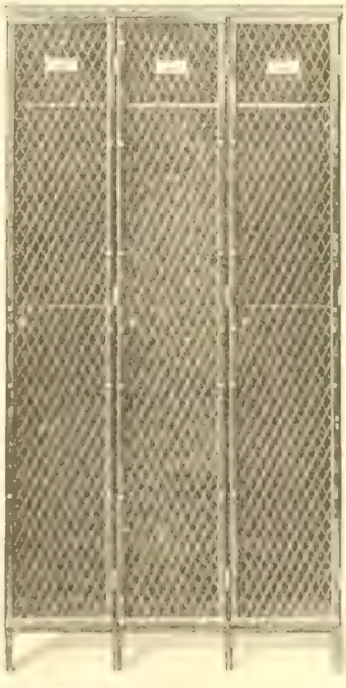
115 Adams Street, Chicago

Canadian Agents

Eadie Douglas, Limited
Montreal, Toronto, Ottawa

Grose & Walker, Limited, Winnipeg
Dean Thompson, Vancouver

'Meadows' Metal Lockers



Make friends because of their substantial construction and unique features. We make several styles and sizes of these lockers. We'll know what you want if you just hint at your requirements.

Send for our interesting booklet entitled

"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co. Limited
TORONTO, ONTARIO

A Concrete Floor that Wears and Looks Like One of Tile

can easily be had by two applications of Glidden's Concrete **Floor Dressing.** This sanitary coating keeps the cement dust from rising and injuring stock or machinery, prevents water, oil, grease and other stains from penetrating and staining the floor—makes the rooms in which it is used sanitary, lighter and brighter. It reduces vibration and noise, and produces a soft easy tread.

The grinding action of shoe heels and heavy trucks will not affect it. It wears like Iron. It penetrates the pores of the floor surface and binds with it, producing a beautiful high class finish similar to tile.

Glidden's Concrete Floor Dressing

is made in tan, terra-cotta, light drab, transparent and white. Has large covering capatity and can be easily applied with a brush like paint or varnish. It's better than paint for wood floors.

Let us send a free sample so you can prove, by test the wonderful results it gives. Architects who specify and builders who use Glidden's Concrete Floor Dressing gain in pleased clients. Write to-day for color card and booklet with specifications. Address

THE GLIDDEN VARNISH COMPANY

Largest Manufacturers of Varnish and Concrete Finishes in the World

FACTORIES:
Cleveland, Ohio — Toronto, Ont.

BRANCHES:
New York — Chicago

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

THE STANDARD COMPANY LIMITED

GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA

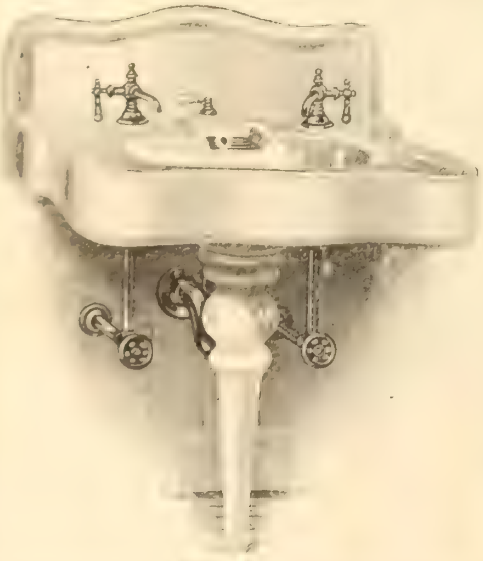


Fig. 141.

Our New Lavatory as used by the

CANADIAN PACIFIC RAILWAY COMPANY

for their Hotels at BANFF and LAKE LOUISE

Large Slab, 23 x 30″. Large Bowl, 13 x 18
Combined Soap Cup and Overflow Strainer

The overflow is countersunk in slab, and is made 3 x 6 inches with a soap cup strainer draining into overflow.

ORDER ONE FOR YOUR SHOWROOM

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
155 NOTRE DAME, WEST

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 May 3, 1911 No. 18

Improved Specifications

The need for some consideration of the above subject is emphasized by a recent investigation of the Department of Public Works in a large American city. The expenditure involved ran into several millions and the investigation disclosed the fact that the specifications for the various works were faulty, that certain contractors had been favored, and that the work had been conducted in a loose and extravagant manner. Undoubtedly the first item is of primary import- many of the objections made in the investigation cited could be sustained pretty generally in specifications for our own municipal work. Ambiguity of clauses in specifications is the base of the contracting business and undoubtedly much improvement might be made in this direction. Indefiniteness of this kind tends to limit real competition and throw the work to one or two bidders, for the simple reason that one or two only will probably have done considerable work for the city before and have some idea as to the manner in which such clauses will be construed by the engineer. Their competitors are obliged to protect themselves by bidding high enough to cover all contingencies. Under such conditions the city must be the loser.

One of the indefinite clauses referred to is the unqualified statement that the material or work must be "satisfactory to the engineer." Another class of indefinite requirements comprises those calling for lump bids on construction of indefinite amount or nature, as of foundations carried down to solid rock, where no borings have been made to indicate what such depths may be, or leaving indefinite the location of certain work.

Perhaps in the majority of cases such as these last the engineer is not primarily to blame, being frequently required to prepare plans anad advertise the work before he has had sufficient time to thoroughly investigate the conditions existing, to make proper borings, etc., or perhaps without being allowed to spend the money necessary for such investigations. It is no uncommon occurrence to have the city council, or other body of officials not familiar with the amount of work involved, direct the engineering department to prepare plans and estimates and report the same within say two weeks, when the thorough consideration which the subject should receive would occupy at least four or five months; and, having received such hastily prepared plans, to direct the engineer to receive bids on the same after a brief period of advertising. We have several times called attention to the desirability of deciding on the next year's work in the fall, thus giving the engineering department the winter in which to work up the plans. The too common practice is to make no decision until spring, when the department is already busy with outside field work which has been necessarily deferred until the construction season opened; and then, since that season is already on, urging the engineer to hurry the plans so that the work may be completed before winter closes in.

City councils and municipal engineers would do well to give some consideration to these matters and to cultivate forethought. The engineer should make it perfectly plain that it is essential for him to have sufficient time to make a thorough investigation of projected work and to prepare not only general, but also detailed plans so complete and final in every respect that there will be no necessity for extensive changes in the future. Then, having decided upon what is to be done he should specify it, clearly and simply, in terms that contain no suspicion of ambiguity.

Estimating On New Work

In the spring and early summer a contractor is called upon to make estimates on much new work. To a great extent there is no more important subject connected with contracting than the making of estimates

If the estimate made in bidding is wrong, especially if it is too small, the contractor cannot make a profit on the work. As he is in business primarily to make a profit, this shows the consideration that should be given estimates of cost. Many contractors still use what may be termed the "guessing system" of estimating costs of prices. That is, they make a guess at the probable cost of new work, based either on records of prices or costs of similar work they have done or else from prices that they remember. In other words, the process is entirely a mental one. This method was a very common one some years ago, but to-day, with prices running low, the class of labor that can be obtained being indifferent, and with margins of profits small, it is certainly not a safe method, and it is small wonder that losses are sustained under such circumstances.

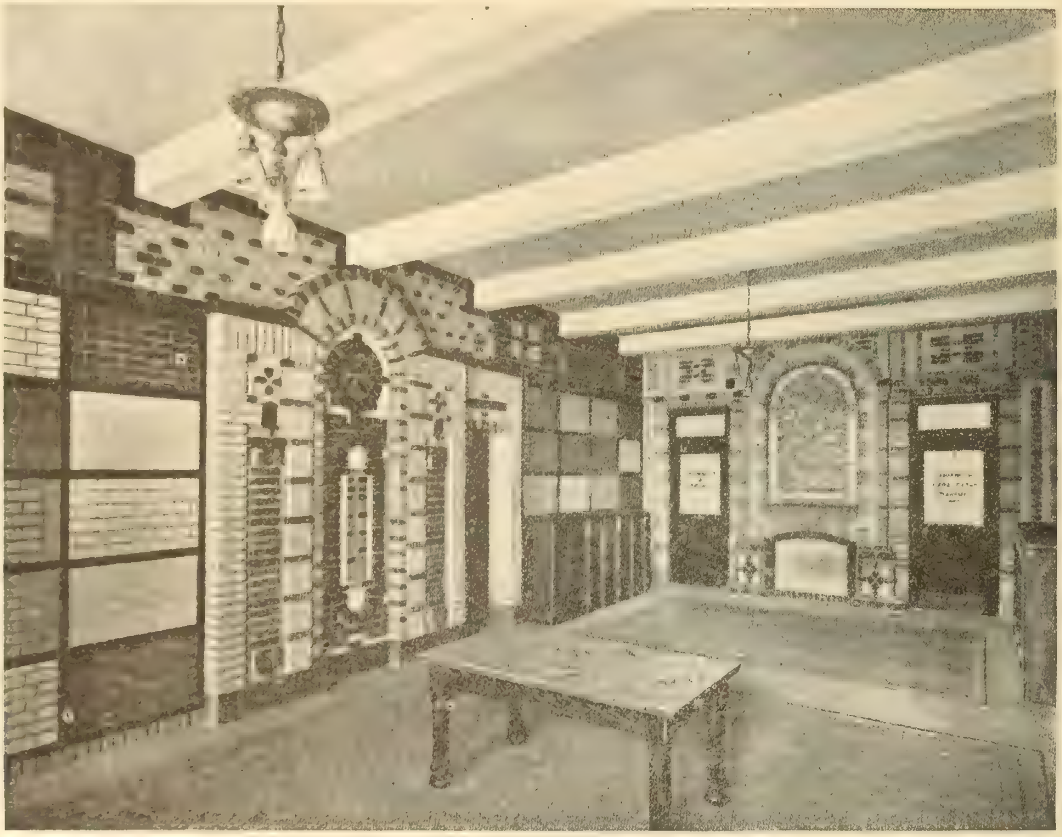
Reciprocity With U. S.?

The Financial News, of London, England, says that up to the present time no less than $2,100,000,000 of British capital has been invested in Canada. In 1910, 81½ per cent. of the total Canadian issues were taken up by the Old Country.

To-day each item in an estimate should be made up separately and upon an analytical basis. If the cost of concrete is being estimated, the first consideration should be the cost of the materials, cement, sand and the aggregate, then the cost of forms should be considered. At times the cost of water for mixing must be listed. A difficult item to estimate is the cost of mixing and placing. This must include preparatory work and that of cleaning up and all extra work that may arise. Then the cost of plant must be estimated and this should include the expense of placing the plant on the job. Last of all is the general expense and this varies much according to the size of the job and character of the work.

If each class of work is made up in this manner in unit contracts, no detail is likely to be overlooked. When lump sum bids are to be submitted, a schedule of all work should be made and then each item can be worked up as suggested, and a total thus obtained.

It is a good idea to have a book in which all such estimates are recorded, so that quick reference can be made to them. This is not only necessary in making up other bids, but allows of the estimates being used if the work is secured, during the life of the job, to learn how the actual cost varies from the estimated. —The Contractor.



Display of Front and Ornamental Brick in the Office of a Leading Manufacturing Firm of New York City

Is a Brick Display Worth While?

The question seems superfluous after a glance at the illustration, which is reproduced from a photograph of a display of Messrs. Fredenburg & Lounsbury, of New York City. We have always been willing to give clay products their due and on more than one occasion we have called attention to what we considered the lack of progressiveness on the part of clay workers in not informing their customers sufficiently as to the great adaptability of clay products and their possibilities in commercial and structural lines. A display of the kind shown herewith would accomplish much as an educational medium, while from an advertising point of view it would be of great value, especially if it were made to throw light upon constructional methods and the varying effects obtainable in shades and colorings.

Many people have little or no conception of the real possibilities in color effect in brick work and we are confident that it would be to the advantage of our larger firms to invest in a sample room of the kind shown. We venture to think that the displays that could be made by our own Canadian industries would be worth while.

Uncle Sam is not bound by the laws that affect owners of less consequence, according to a ruling in the federal court in Minneapolis recently. Suit was brought on behalf of the government against a bonding company which had bonded a contractor, the latter failing before completing the work. The bonding company set up that the government should have presented its claim within one year, but attorneys for the government argued that Uncle Sam was not bound by such regulation, and the court ruled that the contention was correct.

A St. Louis architectural firm has brought suit against a client for damages for alleged libel. The libel is claimed to have consisted in the defendant's making endorsements upon a draft which the plaintiffs drew upon the defendant, which endorsement is declared to have been alleging that plaintiffs made false accounts. While it would be considerable of a question as to the extent of the damage which could be sustained upon the circulation of libellous statements upon a draft, the defendant does not seem to have exercised much judgment in expressing his opinions in that way.

A "Find" in An English Brickyard

An interesting discovery has just recently been made at Mr. F. D. Veasey's brickyard at Goodmanchester, Eng., when the fossilized remains of an Ichthyosaurus were found 15 ft. in the clay and 35 ft. from the top surface of the earth. The discovery was made whilst ordinary digging operations were in progress. The first portion of the reptile found was the ribs, and on digging further the backbone was disclosed, and all the parts of the skeleton were removed.. The vertebrae are, of course, like those of a fish, and each is about 13 in. in circumference and 2 in. thick, whilst the segment weighs on the average about 2 lb. Quite eighteen pieces of the backbone were recovered, and there was one section of the tail. There are a great number of ribs, but unfortunately these are broken into small pieces. Two large fragments were also found, like two of the vertebrae joined, but it is hardly possible to say what they are. A professor from the Sedgwick Museum, Cambridge, has paid a visit to the spot, and places the life of the reptile at something like six million years ago. If the Ichthyosaurus were seen complete it would be about 9 ft. 4 in. in length (a small one). Many are continually unearthed in the Oxford clay at Fletton, but the one discovered at the brickyards has not as yet been put together. Chamber's Encyclopaedia says:

> "The Ichthyosaurus is a remarkable genus of reptiles which inhabited the sea during the deposition of the Mesozoic strata. Like the modern Cetacea, their structure was modified to suit their aquatic life. The body was shaped like that of a fish, the limbs were developed into paddles, and the tail, long and lizard-like, was furnished, it is believed, with a fleshy fin, as in the dolphin, except that its position was vertical. The head was large and produced into a long and pointed snout, resembling that of the crocodile, except that the orbit was much larger, and had the nostril placed close to it, as in the whale, and not near the end of the snout. The jaws were furnished with a large series of powerful conical teeth, lodged close together in a continuous groove, in which the divisions for sockets, which exist in the crocodile, were indicated by the vertical ridges on the maxillary bone. The teeth were hollow at the root, sheathing the young teeth, which gradually absorbed the base of the older ones, and, as they grew, pressed them forward until they finally displaced them. The long and slender jaws were strengthened to resist any sudden shock by being formed of many thin bony plates, which produced light and elastic as well as strong jaws. The most remarkable feature in the head was the eye, which was not only very large—in some specimens measuring 13 inches in diameter—but was especially fitted to accommodate itself for vision in air or water as well as for speedily altering the focal distance while pursuing its prey."

Building Bridge Piers with Little Clearance

The two passenger tracks of the main line of the Erie Railroad cross the westbound passenger track and the freight track of its Newark Branch on a two-span skew plate girder bridge with a concrete centre pier and two abutments 91, 170 and 201 feet long, respectively, that although of ordinary construction, were difficult to build on account of the narrow clearance with constant traffic on the surface tracks. The abutments, about 16 ft. high above the ground, are 5½ ft. thick under the coping and 10 ft. 9 in. thick at the base, 5 ft. below the surface of the ground, and 2 ft. below water level. The centre pier is 5 ft. wide under coping and 7 ft. wide at the base and is provided with one, and the abutments with two, tongue and groove vertical expansion joints. The coping, 18 in. thick, is made monolithic with the rest of the concrete.

Construction was commenced by digging the foundation pit 5 ft. deep, which as the excavation progressed was sheeted with 2-in. square-edge sheet piles driven with mauls. Water was kept down by pumping, and foundation piles 60 to 75 ft. long were driven in the pit, 2 ft. 7 in. to 3 ft. 6 in. apart on centres, and cut off below ground water level. The piles were driven through deep soft mud by a No. 2 Vulcan steam hammer to a refusal of less than 6 in. under the last ten blows and until their points presumably entered a clay and gravel stratum.

Sand, gravel and cement were stored as much as possible in the cars on which they were delivered and were wheeled by hand to the Ransome concrete mixing machine, which delivered to Stuebner 1-yd. bottom dump steel buskets carried on flat cars on a 24-in. gauge industrial track to the forms, into which they were dumped by a stiffleg derrick. The derrick had a 35-ft. boom, was mounted on wheels and was operated by a double-drum Lambert hoisting engine.

The forms were made in lengths of about 50 ft., corresponding to the distance between expansion joints, and were built of 10 x 2-in. horizontal square-edge planks with 3 x 4-in. outside vertical pieces 3 ft. apart on centres. On account of the train clearance of only 4 ft., outside braces for the forms were inadmissable and they wer secured entirely by interior bracing of horizontal transverse permanent wires and removable filler pieces. Half a dozen loops of vertical pieces at distances about 3 ft. apart vertically. Usually they were passed through holes bored in the planks and they were twisted inside the forms to create sufficient tension and bring the forms to close bearing on the spacers. The vertical pieces were in short lengths overlapping each other and when necessary were sawed off to allow the boards in the lower part of the form to be removed and used for the upper portions before the completion of the pier.

To prevent movement of the structure when placing fill the abutments and centre pier where overlapping were praced apart at the foundation by concrete struts, 3 ft. square, reinforced with old rails, spaced 20 ft. apart, and supported on piles. The portions of the abutments not opposite the centre pier were buttressed similarly with concrete on piles, the struts being 3 ft. square at the abutment, 3 x 9 ft. at the end aad 20 ft. long.

After the forms were stripped the surfnce of the concrete was washed with cement and rubbed with ordinary bricks, which gave as good satisfaction as the carborundum bricks first used, although it was the contractor's experience that after a year or two weathering the appearance of the concrete is as good without rubbing as when rubbed. The principal quantities include 1,410 cu. yd. of excavation, 500 piles and 2,486 yd. of 1:3:5 monolithic concrete made with Atlas Portland cement. The work was executed in three months by a force which consisted, on an average, of about forty-five men.

The work was designed and constructed under the direction of the engineering department of the Erie Railroad, Francis Lee Stuart, then chief engineer, and Mr. C. K. Conrad, assistant engineer. The contract was awarded to the Phoenix Construction Company, New York.—Engineering Record.

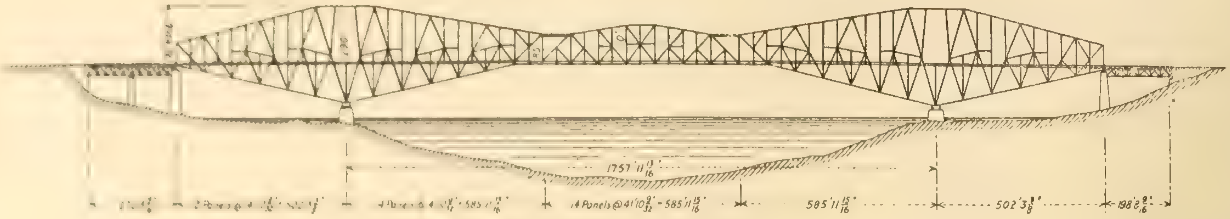


FIG. 1. OFFICIAL DESIGN V, BOARD OF ENGINEERS.

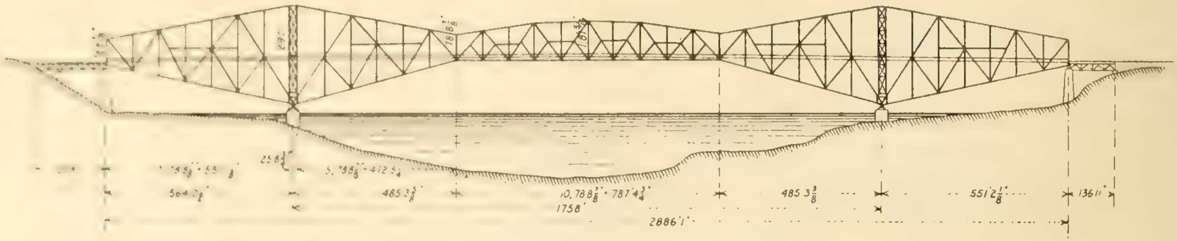


FIG. 2. DESIGN OF MASCHINENFABRIK AUGSBURG-NUERNBERG.

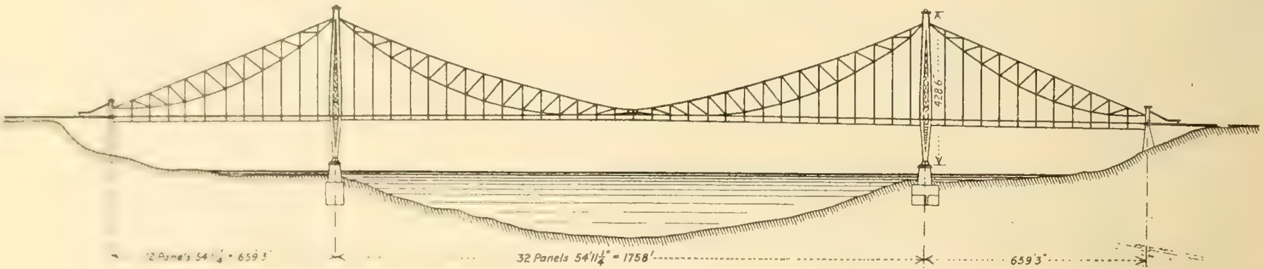

428' 6"
12 Panels 54' 11 1/4" = 659' 3"
32 Panels 54' 11 1/4" = 1758'
659' 3"

FIG. 3. SUSPENSION DESIGN (LINDENTHAL) OF PENNSYLVANIA STEEL CO.

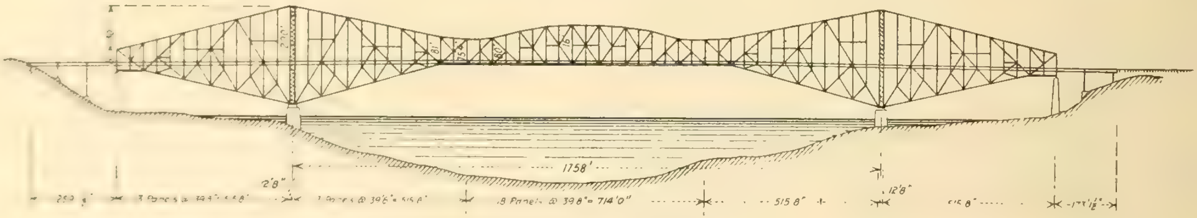


FIG 4 DESIGN M-N OF THE ST. LAWRENCE BRIDGE CO

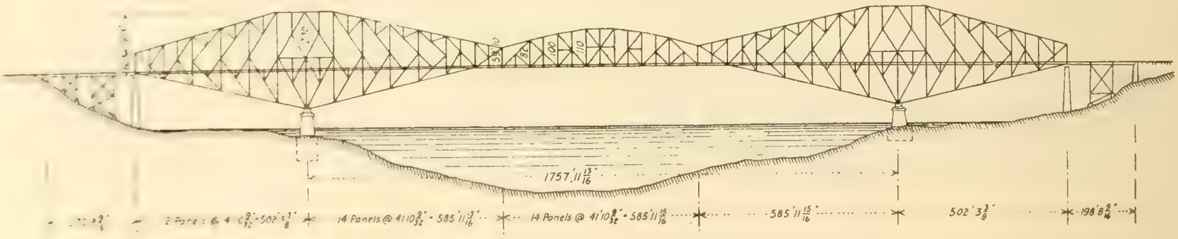

1757' 11 13/16"
14 Panels @ 41'10 9/32" = 585' 11 15/16"
14 Panels @ 41'10 9/32" = 585' 11 15/16"
585' 11 15/16"
502' 3 3/8"
198' 8 9/16"

FIG. 5. DESIGN A-B-X OF THE ST. LAWRENCE BRIDGE CO.

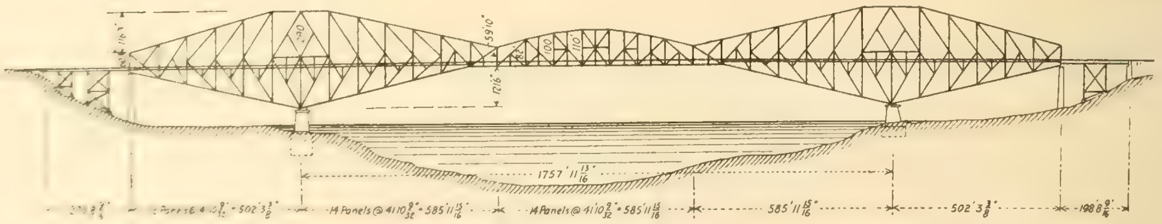

59' 10"
121' 6"
1757' 11 13/16"
502' 3 3/8"
14 Panels @ 41'10 9/32" = 585' 11 15/16"
14 Panels @ 41'10 9/32" = 585' 11 15/16"
585' 11 15/16"
502' 3 3/8"
198' 8 9/16"

FIG. 6. DESIGN C-Y OF THE ST. LAWRENCE BRIDGE CO.

OUTLINE DIAGRAMS OF SIX COMPETING DESIGNS FOR THE NEW QUEBEC BRIDGE OVER THE ST. LAWRENCE RIVER.

Designs Submitted for the Quebec Bridge

Together with the Accepted Design of the St. Lawrence Bridge Company, of Montreal—Interesting Features of the Various Plans

The diagrams of the accepted design upon which the contract for the reconstruction of the Quebec bridge was awarded to the St. Lawrence Bridge Company, of Montreal, and also six of the competing designs are reproduced herewith from an official drawing.

The St. Lawrence Bridge Company, as is now well known, is a combination of the Dominion Bridge Company, Montreal, and the Canadian Bridge Company, Walkerville. The contract price is about $8,650,000; this sum and the contract price for the substructure make a total of about $12,000,000. It is expected the bridge will be finished by 1915. In addition to the St. Lawrence Bridge Vompany, three other firms tendered on this work, namely, the Maschinenfabrik Augsburg-Nurnberg Aktien Gesellschaft, of Gustavsburg, Germany; British Empire Bridge Company, of Montreal, and the Pennsylvania Steel Company, of Steelton, Pa. Tenders were based on the plans and specifications prepared by the Board of Engineers in charge of the work, but contractors were granted the privilege of preparing plans of their own, if they should so desire, and submitting tenders thereon. Three of the above firms availed themselves of this privilege; the St. Lawrence Bridge Company, in fact, submitted seven different plans with tenders, in addition to tendering on the Board's plans.

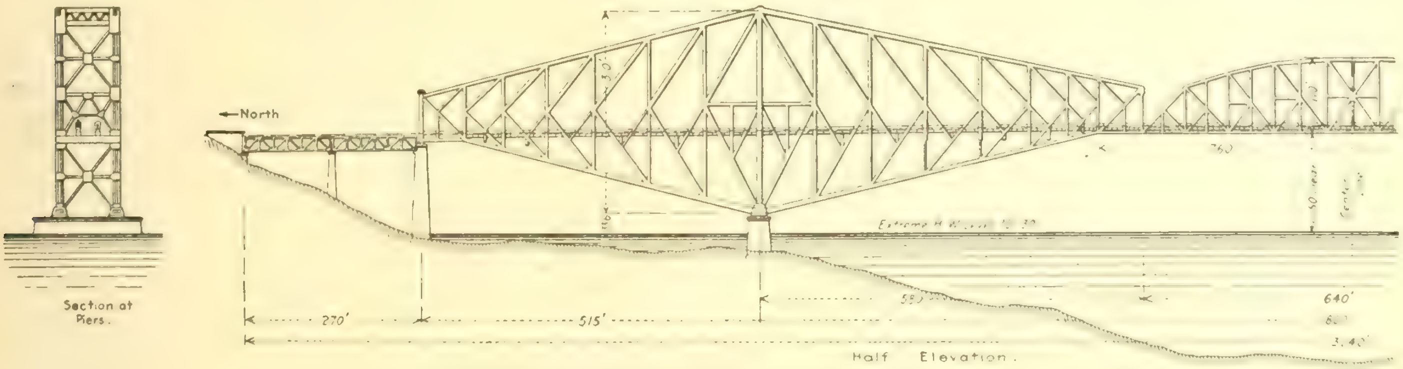


FIG. 7. ACCEPTED DESIGN OF ST. LAWRENCE BRIDGE CO.

The official plan was for a cantilever bridge with anchor arms and cantilever arms of the same length, and the erection to be by cantilevering out the suspended span. Five modifications of this design were also prepared by the Board, a tender on any of the six propositions being considered a tender on the Board's design. Two of these schemes were based on erecting the suspended span by cantilevering out, while the remaining four were based on erecting the suspended span at an adjacent site and floating it into position.

The Maschinenfabrik Augsburg-Nurnberg Aktien Gesellschaft tendered on three of the designs of the Board. It also submitted a tender on a design of its own, fig. 2. The principal features of this design are the large panels, the small number of members in the web system and the length of the suspended span. The material proposed was a chrome nickel steel. Built up riveted members were to be used for tension members throughout.

The British Empire Bridge Company submitted six tenders on the Board's design only. It proposed two schemes of erection in connection with the floating in of the suspended span; one floating the span in on high falsework, the other by floating in a light temporary span to be used as staging upon which the suspended span is erected.

The Pennsylvania Steel Company submitted ten tenders on the Board's design and one tender on an eyebar suspension span designed by Mr. Gustav Lindenthal, fig. 3. This company submitted prices on two schemes of erection of the suspended span. In one scheme the suspended span is floated in on high falsework, while in the other the entire span is lifted directly from the pontoons by a special lifting device designed and patented by the company.

The St. Lawrence Bridge Company submitted a tender on each of the Board's designs and, in addition, seven tenders on designs of its own. In general elevation and outline the designs submitted by this firm conform to that of the Board's design. Two of these designs are of the single intersection Warren type, fig. 4, the remaining five being variations of the single intersection K web system type, figs. 5 and 6. The variations in these different tenders were due mainly to variation in the details of the members, as well as the proportion of nickel and carbon steel used in the construction.

The design approved by the majority of the Board, as well as the additional experts appointed by the government, was one submitted by the successful contractors, it being the opinion of the engineers that this design contained several features, particularly in respect to erection, that rendered it preferable to the designs prepared by the Board.

The design fig. 7, is to have the K web system in the cantilever and anchor arms, the suspended span being a modified Pratt. All members in the anchor arm and those immediately over the main pier, as well as the floor system, are carbon steel, the cantilever arms and suspended span being of nickel steel. The top chords are composed of built-up riveted members extending over one full truss panel or two floor panels.

The suspended span is 640 fe. long, 110 ft. deep at the centre and 70 ft. at each end. The cantilever arms are 580 ft. long, 70 ft. deep at the end and 310 ft. high over the main post. The anchor arms are 515 ft. long, as at present designed. The trusses are 88 ft. apart and there is a clear headroom of 150 ft. above extreme high water. The total length is about 3,228 ft.

The bridge will be designed to accommodate two railway tracks and two sidewalks for foot passengers, the government having decided that no accommodation will be provided for highway traffic. The train load allowed for on each track will be equivalent to two E60 engines followed by a train load of 5,000 lbs. per lineal foot of track.

The length of span has been slightly increased over that originally proposed by the Board, being now fixed at 1,800 ft., being the same as the original span. This increase was brought about by a rearrangement in the manner of sinking the caissons, thus allowing the centre line of the new bridge to remain coincident with that of the old bridge. The old main piers will not be used, but will be taken down to lower water level, the stone being reused in the new piers.

Inspection of Bridges Should Influence Design

The influence of current bridge inspection on bridge design should be greater than it is, according to the following discussion by Prof. H. S. Jacoby, of Cornell University, at the recent annual meeting of the American Railway Engineering Association:

"In connection with steel bridges, there is hardly any material available in published form relating to the lessons taught by the observations of bridges under traffic conditions. All over the country bridge inspectors are making their rounds, looking at the details of bridges and making records of conditions discovered and recommendations as to repairs required. After the repairs are made the incident is closed for that structure, and so the matter goes on year after year. There must be some important lessons taught by the extensive experience of these inspectors which should influence design much more largely than it apparently does.

"One reason is that the maintenance department is entirely separate from the bridge department, in which the designs of new structures are developed. There are doubtless also other influences at work. Designers and draughtsmen have but little opportunity to become familiar with these matters by direct observation. It seems that the railway does not get the full benefit of the experience of the maintenance department, thus leading to the continued construction of some faulty details because the designers do not learn (except incidentally) of the actual behavior of bridges previously designed by them.

"For example, certain designs of brackets on end floor beams perform their duty in an excellent manner under heavy modern live loads, and under adverse conditions of adjacent track, while others show marked defects. Yet the defective designs are built over and over again on the roads in which the maintenance-of-way department has discovered their weakness.

"This condition is not confined to steel bridges. I am convinced that some railways are losing at least two or three years of service in their Howe trusses because of the lesser relative efficiency of the splices in the lower chords. This is an indication that there are details in timber framing which are not receiving sufficient study by designers, although similar timber structures have been used for many years. This is probably true because the conditions under which failure occurs are not brought to the attention of designers."

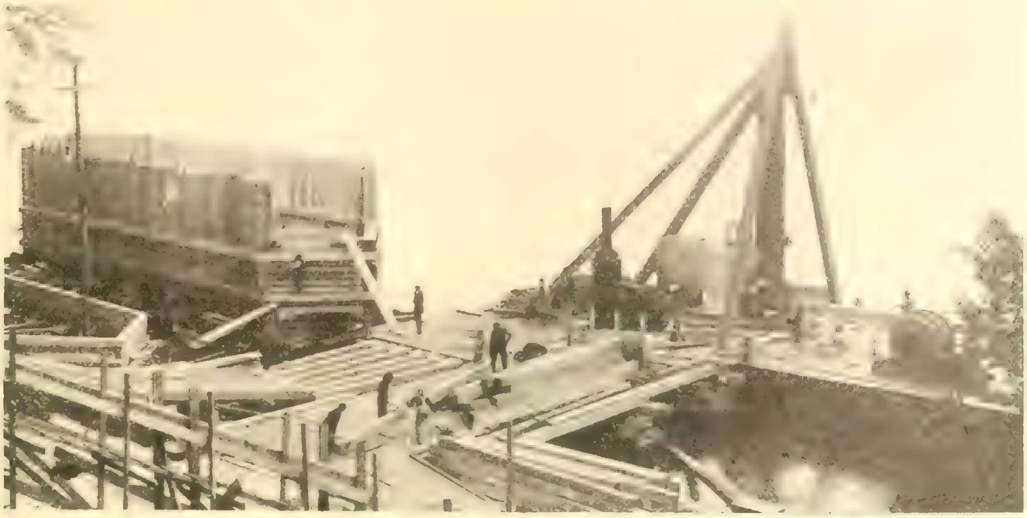
An Expeditious Piece of Work

Rapid reconstruction of a burned trestle was accomplished on the Duluth, South Shore & Atlantic Railway by systematic organization of a gang of about 30 men, the time required being 32 hours for 518 feet of trestle 28 feet high. The original structure was of piles, but in rebuilding, framed bents were used, the burnt piles being cut off for sills. Details of the organization and procedure were furnished by Mr. William Noon, superintendent of bridges of the road, to the "Railway and Engineering Review." Four men ahead cleared around the burnt piles to enable a second gang of three to cut them off at proper level and dowel the sills in place. As fast as this was done the heights of bents were found with a pole and cross-bar, sights being taken from the end of the bridge. Three men did this work and framed posts. Four men carried timbers to the bent men, and six packed and raised the bents. Each was raised by a block and tackle attached to the top of the previous bent. The bents were framed in each case with the post bottoms resting on a 2 x 4-in. piece spiked horizontally to the side of the sill near the top, so that in raising the bent the bottoms of the posts rose over the edge of the sill to their bearings on top. As the bents rose, a deck gang of four placed stringers and ties and laid down rails loosely. Four other men supplied them with timbers, pushing out at each truckload enough stringers for one panel. Two men followed the deck crew, doweling and line-spiking.

Driving Piles Through Hard Stratum

Driving piles through a hard stratum overlying softer material may be accomplished without damage to the pile by first breaking a hole through the hard material before final driving is started. A method of doing this is suggested by Mr. F. E. Schall, bridge engineer, Lehigh Valley Railroad, in discussing the recommendation that the hard stratum be removed, as made by the committee on wooden bridges and trestles of the American Railway Engineering Association. This method was adopted in a case where 55-ft. piles had to be driven through a hard embankment under track with a pile-driver having leads of only 40 feet. A 12-in. wrought-iron, double-strength pipe, 25 feet long, was fitted with a steel point and cap and was driven 20 feet into the embankment. It was then withdrawn, the pile dropped into the hole and driven to the proper depth.

The Trent Valley Canal is now open from Orillia to the Trent River, a distance of about 160 miles. The canal was begun before Confederation and has involved an expenditure, up to 1911, of $7,873,501. The route utilizes nearly twenty lakes and numerous rivers, and when completed will form an inland waterway from the Bay of Quinte to Georgian Bay and the Great Lakes. The section from Rice Lake to Lake Ontario, 71 miles, is under contract, at an estimated cost of $6,759,000. It is the most expensive section of the whole canal, and follows the general course of the Trent river. On this section there are to be eighteen locks, with a total fall of 369 feet.



1.—Canadian Light and Power Company's Development.—Cofferdam Ready to Launch

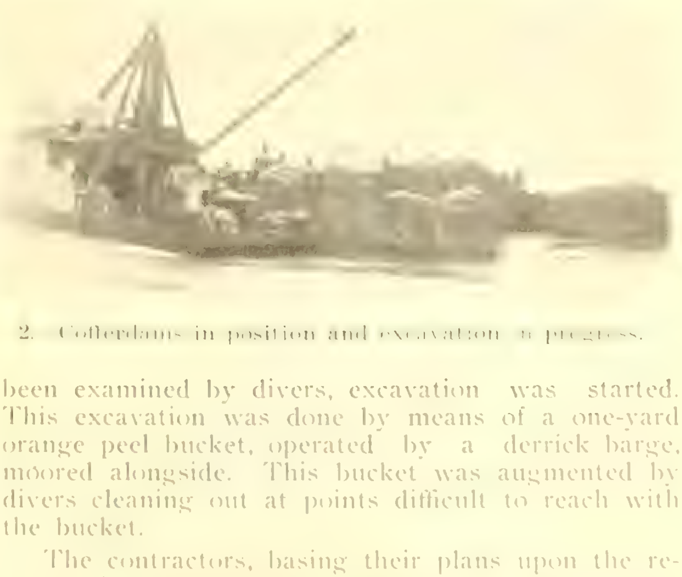
The St. Lawrence River Crossing of the Canadian Light and Power Company's Transmission Lines

A power development of the magniture of that in which the Canadian Light & Power Company is now engaged always presents new features of interest to the engineer. One of these in this undertaking was the spanning of the St. Lawrence River. This is particularly noteworthy because of the width of the river and the lateness of the season during which the work was carried on.

The high tension lines of the company are to extend from the power house at St. Timothee, Que., to Montreal, in all a distance of 26 miles. These lines, consisting of eight cables, are to be carried on steel towers, the economical height and spacing of which was figured to be 52 ft. and 500 ft. respectively.

While these heights and intervals of towers could be followed throughout the greater part of the distance, the St. Lawrence River, with its depth of water and rapid current, necessitated a special treatment. After an exhaustive study had been made and numerous soundings taken, the company's engineers decided to effect this by erecting on the shore of the river steel towers approximately 130 ft. in height, and building at the centre of the river two concrete piers extending about 15 ft. above the mean water level, and on these a tower 150 ft. in height. The point at which the cables were to be carried across the river was located almost 700 ft. below the precent C. P. R. Lachine bridge. At this spot the river is about 3,400 ft. wide. As the soundings had located a shoal in the river only about 200 ft. away from the centre, and as the water at this point was only about 12 ft. deep, it was decided to erect the river piers at this point. This meant that the span of the cables from the Caughnawaga side of the river would be 1,600 ft., while that from the river tower to the Highlands shore would approximate 1,800 ft. These the writer believes to be the longest spans in Canada.

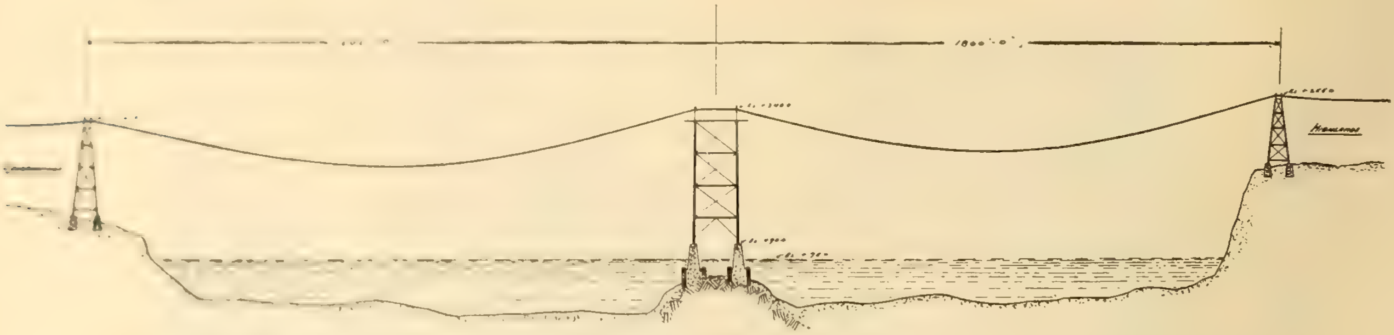
The contract for the above work was not given out until about September 1st, 1910. It was awarded to the Foundation Company, Limited, Montreal, P.Q., who were also engaged in installing the foundations for the double tracking of the C. P. R. bridge, just above this work. These contractors, appreciating the lateness of the season and the danger of remaining out on the river any longer than was necessary, started work at once. They quickly assembled additional plant and while waiting for the timber for the cofferdam commenced operations by installing the shore piers on the Highlands side of the river. As it was impossible sooner to obtain the large quantities of timber required for the cofferdams in the river, work on the first one was not commenced until September 15th. Work was immediately started on cofferdam No. 1, and this was launched on October 4th. To economize time, this had been built wtih the sheeting out to its site, anchored in position, weighted and sunk. The false bottom was then removed and the sheeting driven. After the inside of the cofferdam had been examined by divers, excavation was started. This excavation was done by means of a one-yard orange peel bucket, operated by a derrick barge, moored alongside. This bucket was augmented by divers cleaning out at points difficult to reach with the bucket.



2. Cofferdams in position and excavation in progress.

The contractors, basing their plans upon the records of the soundings which had been given them, expected to find rock at a distance of from 5 ft. to 6 ft. below the bed of the river. Excavation, however, showed that these borings had all stopped on large boulders. Further tests showed that rock could not be located at a further depth of 20 feet.

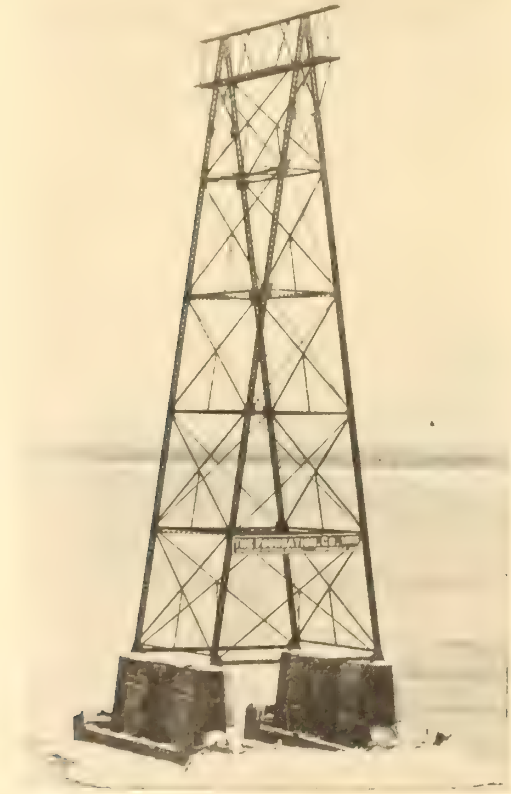
As the lateness of the season precluded any radical change,, the engineers for the company decided to build the piers on this boulder foundation, leaving pockets in the piers through which pneumatic caissons could be sunk to bed rock the following season. This was made necessary by reason of the fact that the boulder formation does not extend down to rock but overlies sand and gravel.



4.—Canadian Light and Power Company's Development—Sketch showing the exceptionally long spans

While the river work in connection with cofferdam No. 1 had been proceeding, the framing of cofferdam No. 2 had been carried on. This was launched on October 24th, towed to its position, weighted, sunk and excavated.

As the excavation was completed in each cofferdam, about 4 ft. of concrete was deposited under water all over the bottom. The cofferdams were then pumped out and the forms erected. These were framed so as to give the conventional type of nose to each pier, these noses being protected with an armor of old rails embedded in the concrete. Both piers were brought up to grade by November 30th. As a precautionary measure about 1,000 tons of rip-rap were placed at the upstream ends of the piers.



5.—Completed Piers, with Steel Tower

The broken stone and sand used in the concrete and the rip-rap were delivered to the site of the piers in barges handled by a tug used in connection with the work. The lumber, cement, fuel, etc., were ferried to the piers from the shore on a scow, operated by a hoisting engine, which propelled same by picking up anchor lines from buoys stationed at convenient points.

The work was done by the Foundation Company, Limited, Bank of Ottawa Building, Montreal. J. D. Evans was resident engineer for the Canadian Light & Power Company.

Engineering and Architecture[*]

The separation of the engineer from the architect was the topic of Luzerne S. Cowles, '97, of Boston, who noted how in European countries the harmonious and artistic development of civic centres during modern times has proved an enormous benefit to them. In ancient times the architect acted as his own engineer; there was little haste in completing a project; and artistic treatment requiring much time and labor was made possible. The ultimate aim of securing the best results was then possible, because time and labor were less important than they are to-day. In the United States there has been, until recently, the tendency to keep the engineer and the architect apart, and the result has been very much in the way of inartistic utilitarian building. Municipalities have been grave offenders in this respect. Consequent on the increase in wealth and population of the cities of the United States, there is at the present time from public and press alike the demand for rational and civic improvement along harmonious lines. The engineer, inartistic as he may be, comes now to the aid of the architect, who will submit to him questions where engineering judgment is desired, while on the other hand the engineer must acknowledge that the architect has the advantage of improving the appearance of constructions, especially of metal. This co-operation was the dominant note of the latter portion of Mr. Cowles' paper, who showed that while private individuals assumed the right to erect almost any kind of building they wished, the public service corporations are realizing the importance of erecting structures good not only from the engineering, but the architectural standpoint. "The training of architects in close proximity to engineers should be encouraged," said Mr. Cowles; "the architect's work embraces the designing of buildings whose form depends on engineering theory and experience." This proximity need not affect the architect's artistic tendencies, but it cannot help training his mind to better work."

---

[*] Extract from paper presented before the Congress of Technology.

Road Construction in British Columbia

Progressive Policy of the Western Province—Standard Principles Exemplified in Numerous Highways—Extensive Improvements Planned this Season

Road-building generally in British Columbia, owing to the inexorable physical character of the country, presents more complicated engineering problems than does the work of highway construction virtually anywhere else in Canada. And yet it is to the greater glory of provincial enterprise that the main trunk thoroughfares on Vancouver Island and in and about the older settled portions of the lower Mainland enjoy a far-reaching reputation for well-studied gradients, sound construction, excellent surface and workmanlike maintenance. The credit belongs largely in the first instance to the Royal Engineers, who in the earliest colonial days laid the foundation of the British Columbia Good Roads system, and in doing so set a high standard in science construction which has served as an object lesson and stimulus to successive generations.

Roads in this province usually originate in trails, these in the process of evolution incident to settlement and development becoming rural thoroughfares and ultimately trunk highways. At the close of the last fiscal year there was in existence and use in all parts of British Columbia approximately 15,500 miles of public road, this estimate including improved pack trails. To estimate the value of this road system is quite impossible, conditions varying greatly as to construction costs, and no dependable statistics having been systematically kept with respect to road work until during the past few years. The expenditure upon British Columbia roads to date may, however, safely be placed at nothing less than twenty-five million dollars, a considerable portion of which estimate is represented by the cost of the historic Cariboo road from New Westminster and from Yale, the head of navigation on the Fraser River, into the mines that made British Columbia famous.

This wonderful highway, following for a considerable distance the tumultuous waters of the Fraser, through its canyon and clinging almost impossibly to the sheer walls of rock, although it is now falling into ruin in many places where it has been abandoned since the advent of the railway, nevertheless constitutes an enduring monument to the engineering efficiency of British Columbia's earliest pioneers which impresses all who have opportunity of studying its location line and construction.

Not only does the problem of road-making and maintenance offer exceptional difficulties in this Pacific province by reason of the generally mountainous character of the country, and its heavy forestation, but in so far as the lower Mainland and Vancouver Island are concerned, these being the districts containing the greater mileage, deterioration is naturally more rapid than in the other provinces of Canada.

Road building commands attention commensurate with its importance as a factor in colonization and in public economy generally. During the present fiscal year, beginning on April 1 and ending on March 31 next, a governmental road expenditure of $4,500,000 is contemplated and authorized; while in order to keep pace with the march of development it is roughly estimated that something like twenty million dollars will be invested in public roads by the British Columbia authorities during the period of 1910-13 inclusive.

Road construction methods have very greatly changed during recent years, the old-time practice of making the first object of road-building the distribution of funds to the district residents having been long since abandoned for principles of a strictly business character. In this connection the modern policy has been to introduce road-making machinery wherever possible. Graders, traction engines, wagons, road rollers, and logging engines, with rock crushers, are generally employed, with a more generous use of powder than ever before and the application of the machinery of the logging camps to a large extent where heavy clearing is necessitated.

In its road-making plant in all parts of the province the government at present possesses an asset roughly representing in value $100,000 while of the appropriation of this year of $4,500,000 for roads and bridges, the largest estimate for any year in the history of the country, it may conservatively be said that a gain or saving in results of at least $1,500,000 will be secured through the use of road-making machinery and modern scientific methods at a cost of another $100,000 as against the practice of the old pick and shovel days.

Extensive Improvements Contemplated

Referring to the road-building programme for the present fiscal year, it may be said that colonization construction will be chiefly along the upper reaches of the Cariboo road to Quesnel and Barkerville and to Fort George and thence to Fort Fraser and on to Hazelton, from which point the trun road will probably be eventually extended yet further north. In the southerly districts, repairs and improvements generally will be undertaken to put in the best possible order the existing trunk and branch road systems of the Okanagan, the Spence's Bridge and Princeton and the Kamloops and Princeton roads, the highways of the Boundary district, and the roads with which the large Ymir district is being well supplied. From the Kamloops centre there are already many excellent radiating thoroughfares to the Okanagan, to Salmon Arm, and into the Nicola country, while a new road that will be of great importance as a colonization factor is now being pushed up the valley of the North Thompson River.

In the Chilliwack and Delta districts road improvements on a large scale are contemplated in the very near future, in connection with which it is the intention of the government to establish a large rock crushing plant at Veddar mountain, on the line of the British Columbia Electric Railway, the crushed rock to be distributed to the various district centres by the electric transportation system, and from these centres taken by the provincial authorities for road work or delivered to the municipalities for similar use within their corporation boundaries.

The roads of British Columbia are allowed a general right-of-way width of 66 feet, while the roadbed proper has a standard graded width of 24 feet, exclusive of ditches, the crowning of the road bein never greater than one inch in 12. Macadam roads are by reason of British Columbia's natural conditions the standard of construction system, little or no corduroy being in evidence and oiled roads not yet having made their appearance, although it is hoped to initiate experiments this summer with the latter or else with tarvia or tar-macadam.

The Department of Public Works is also laying in conjunction with Point Grey municipality and the C. P. R., in the district of Richmond over four miles of bitulithic pavement, from Granville street in Vancouver, at the southernd boundary of that city, to Eburne. The first oiled road in British Columbia will also be in the immediate locality of Vancouver city, the intention being to oil the Marine Drive from the Vancouver city boundary at Alma street round by the shore towards the open Gulf, to connect with the McGee road. This drive at the present time offers the finest example in macadam road construction to be found in British Columbia, or anywhere else so far as known. The intention is to oil it for the avoidance of dust from Alma street for about three miles, to where it leaves the beach. The method is to sweep the road clear of dust with wire brooms and then apply the oil to half the road at a time, it being very important that the road should not be traveled over at least three or four days after being oiled.

On Vancouver Island the roads generally are in excellent condition with the exception of a short section connecting Big Qualicum with Union wharf, which is now receiving attention. The improvement of the main Victoria-Campbell River road and the opening of road communication with Strathcona Park are also on the official programme, as well as the location of possible new roads from Nootka Sound and from Alberno via Great Central lake to furnish alternative avenues of entry to the Butte Lake and Strathcona Park country. Of colonization roads on Vancouver Island, the most important now in hand are those to serve the Clayoquot-Ucuelet district and the San Josef Valley, in both of which localities a large amount of colonization settlement has latterly taken place.

Tensile Tests of Large Concrete Specimens

Some time ago tensile tests were made at Cornell University on concrete specimens measuring 6 x 6 x 18 inches in order to learn the behavior of large specimens in tension and determine values for the tensile strength of concrete. These tests were described by Prof. A. P. Mills, assistant professor of civil engineering, in a recent issue of the Cornell Civil Engineer.

The specimens tested were of three different mixtures. The first was a 1:2:4 mixture containing limestone crushed to pass a 1½-inch ring. The second a 1:2:4 mixture containing cobbles, mostly sandstone, crushed to pass a 2½-inch ring. The third was a 1:2½:5 mixture using crushed sandstone similar to that of the second mixture. Nazareth Portland cement was used exclusively.

Special attention was given to the design of the grips, since earlier tests of large specimens have indicated a tendency to crush or shear off in the jaws before actual failure in tension occurs. The device adopted was designed with a view to eliminating the danger of failure under complex stress instead of under direct tensile stress.

Each grip consists of a solid cast-steel envelope having the form of a hollow truncated pyramid of square section. The sides of this envelope were machined inside and out to a slope of 1 in 10, the smallest interior diameter being 7 inches, the largest 8 inches, and the length of the envelope 5 inches. Wedges were made of hard maple and, in order to permit them to slide with little friction upon the envelope, they were shod on the outside and ends with steel, machined smooth. The use of four wedges permitted the specimen to be gripped alike on all four sides; ⅝-inch steel bolts placed at the corners connect the envelope to a cross-shaped bearing-plate of cast steel which transmitted the stress to a 1½-inch steel bar which was in turn gripped by the jaws of the testing machine. The connection of this steel bar to the bearing-plate was a spherical bearing, so that there was no possibility of the stress being applied in any manner except along the central axis of the apparatus and specimen. Care was taken in every case to drive wedges in to an equal degree of pressure before applying the load.

The results attained by this device, it is stated, were very satisfactory in every way. The majority of the specimens broke well away from the grips at some point within the 3 to 4-inch space between the grips. In no case, even when failure occurred close to the grips, was there the least indication of any crushing between the wedge grips. The break was always perfectly clean, there being absolutely no loose particles, and the fracture was usually in a plane practically at right angles to the direction of application of the load.

In many instances, in the tests of the sandstone concrete, stones were split in two in the plane of the fracture instead of breaking the bond with the mortar; this was particularly true in the case of the red sandstone.

The 1:2:4 limestone concrete in six tests shows an average tensile strength of 278 lbs. per square inch, the highest being 308 lbs. per square inch and the lowest 253 lbs. per square inch.

The 1:2:4 sandstone concrete in nine tests shows an average tensile strength of 150 lbs. per square inch, the highest being 178 lbs. per square inch and the lowest 128 lbs. per square inch.

The 1.2½:5 sandstone concrete in nine tests shows an average tensile strength of 129 lbs. per square inch, the highest being 179 lbs. per square inch and the lowest being 97 lbs. per square inch.

Compression tests were also made of these mixtures and from the data thus obtained certain comparisons have been made. The tensile strength is in the neighborhood of 10 per cent. of the compressive strength, being 11.1 per cent. for the 1:2:4 limestone concrete, 9.3 per cent. for the 1:2:4 sandstone concrete and 8.8 per cent. for the 1:2½:5 sandstone concrete. Comparing the sandstone concrete with the limestone concrete, while the 1:2:4 sandstone concrete has 64.6 per cent. of the strength of the limestone concrete of the same mix in compression, it has only 54 per cent. of the strength of the limestone concrete in tension. The second-class sandstone concrete has 58.8 per cent. of the strength of the first-class limestone concrete in compression, but only 46.4 per cent. of the strength of the limestone concrete in tension.

Preliminary plans have been prepared for a magnificent new hotel to be erected ultimately in Winnipeg by the G. T. P. This new hostelry will be situated on Broadway, near the Manitoba Club and the new Union Station. In round figures it is estimated that it will cost a million dollars. The name selected for it is "The Selkirk." Messrs. Ross & McFarlane, of Montreal, are the architects.

Comparative Cost of Residence Building

Figures Submitted Under Uniform Conditions Upon Various Materials—Relative Economy of Brick Construction—Prices of Materials and Other Details

At the recent annual meeting of the American Building Brick Association, the secretary, Mr. J. P. Fiske, reported an extensive investigation which had been undertaken with a view to determining the relative cost of a small house built of brick, frame and other types of construction. Mr. Fiske procured plans and specifications of a small, modern 8-room house of good design and ascertained by actual bids from a number of reliable contractors, the differences in the cost of construction. Each contractor was fully advised of the object of the investigation and all entered into the spirit of the investigation and agreed to figure out the cost honestly and fairly to the best of their ability.

Bids were obtained upon the following types of exterior wall construction, the other details being common to all types.

Description of Various Types of Outer Wall Construction

Type 1.—Frame covered with boards and finished with clapboards over building paper; inside surface furred, lathed and plastered.

Type 2.—Frame covered with boards and finished with shingles over building paper; inside surface furred, lathed and plastered.

Type 3.—A 10-inch brick wall, i.e., two 4-inch walls tied together with metal ties and separated by a 2-inch air space; inside surface plastered directly on the brickwork. Face brick to cost $17.50 per M.; inside brick, $9 per M.

Type 4.—A 12-inch solid brick wall; inside surface furred, lathed and plastered. Face brick to cost $17.50 per M.; inside brick, $9 per M.

Type 5.—Eight-inch hollow terra cotta blocks, stuccoed on the outside and plastered directly on the inside.

Type 6.—Six-inch hollow terra cotta blocks, finished with a 4-inch brick veneer on the outside and plastered directly on the inside. Face brick to cost $17.50 per M.

Type 7.—Frame covered with boards and building paper, furred and covered with stucco on Clinton wire cloth; inside surface furred, lathed and plastered.

Type 8.—Frame covered with boards (building paper omitted), and finished with a 4-inch brick veneer on the outside; inside surface furred, lathed and plastered. Face brick to cost $17.50 per M.

Type 9.—Frame finished on the outside with a 4-inch brick veneer tied directly to the studding (boarding omitted); inside surface furred, lathed and plastered. Face brick to cost $17.50 per M.

A separate drawing showing the details of each type of outer wall construction was prepared, and each was accompanied by a set of ocmplete specifications for the entire house.

Everything about the house, except the outer wall construction was identical in all nine types, and may be briefly covered by the following tables:

Details Common to All Types

A.—Foundation—Local stone.
B.—Cellar floor—Finished with 2-inch concrete of Portland cement.
C.—Chimney—Faced with brick costing $17.50 per M.
D.—Fireplaces—Faced with brick costing $17.50 per M.
E.—Plastering—First class. Two coat work.
F.—Exterior trim—Cypress.
G.—Blinds—White pine.
H.—Screens—Copper bronze on white pine frames.
I.—Window frames—Hard pine.
J.—Floors—Double floors throughout with paper between, except in unfinished attic; Georgia pine upper floors; main hall on first floor of oak.
K.—Inside finish—North Carolina pine.
L.—Doors—Washington cedar.
M.—Hardwood—Bronze finish of ordinary type, costing $60 for the job.
N.—Wood mantels—$45 each.
O.—Conductors—Copper.
P.—Flashing—Tin.
Q.—Electric fixtures—Costing $80.
R.—Hot water heating—Costing $250 complete.
S.—Wiring—Costing $68.
T.—Plumbing—Costing $370.
U.—Painting—Exterior and interior; clapboard house, $225; other houses, $130.
V.—Glazing—Double thick German glass.
Note.—Shades, kitchen range and tile work not included.

The following bids were submitted by the contractors, each of whom stood ready to enter into a contract for the house in question at the figures given:

COMPARATIVE BIDS.

Type No.	1	2	3	4	5	6	7	8	9
Description	Clapboard	Shingle	10-inch Brick Wall Hollow	12-inch Brick Wall Solid	Stucco on Hollow Block	Brick Veneer on Hollow Block	Stucco on Frame	Brick Veneer on Boarding	Brick Veneer on Studding
Bid No. 1	$6,732.00		$7,572.00		$7,416.00	$7,777.00	$6,857.00	$7,130 00	$7,080.00
Bid No. 2	6,235.76	$6,370.40	6,736.43	$7,105.00	6,491.23	6,762.83	6,410.00	6,746 20	6,664.88
Bid No. 3	6,692.00	6,786.00	7,118.00	7,418.00	7,179.00	7,238.00	6,847.50	6,970.00	6,895.00
Bid No. 4	6,690.00		7,496.00	7,801.00	7,202.00	7,648.00	7,000.00	7,496.00	7,420.00
Bid No. 5	7,450.00	7,450.00	7,940.00	8,240.00	7,650.00	7,990.00	7,650.00	7,790.00	7,710.00
Average of Bids	6,759.95	6,868.80	7,372.48	7,641.00	7,187.65	7,483.16	6,952.90	7,226.44	7,153.98

A comparison of these five bids, with reference to the excess cost of the various types as compared with the clapboard house, was also shown:

COMPARATIVE BIDS.

PERCENTAGE EXCESS COST OF EACH TYPE OVER CLAPBOARDS.

Type No.	1	2	3	4	5	6	7	8	9
Description	Clapboard	Shingle	10-inch Brick Wall Hollow	12-inch Brick Wall Solid	Stucco on Hollow Block	Brick Veneer on Hollow Block	Stucco on Frame	Brick Veneer on Boarding	Brick Veneer on Studding
Bid No. 1	.0		12.5		10.2	15.5	1.9	5.9	5.2
Bid No. 2	.0	2.1	8.0	13.9	4.1	8.4	2.8	8.2	6.9
Bid No. 3	.0	1.4	6.4	10.8	7.3	8.2	2.3	4.2	3.0
Bid No. 4	0		12.0	16.6	7.7	14.3	4.6	12.0	10.9
Bid No. 5	.0	.0	6.6	10.6	2.7	7.2	2.7	4.6	3.5
Average of Bids	.0	1.6	9.1	13.0	6.3	10.7	2.9	6.9	5.8

In presenting the bids Mr. Fiske said: "As might be expected, a considerable variation appears among the figures submitted by the different contractors. No two contractors, even of equal skill and experience, will figure exactly the same cost on a given set of plans and specifications. Elements of chance must be considered, such as fluctuations in the market price of material and labor, weather conditions, and unexpected difficulties in construction. Moreover, each man's figure will be influenced to some extent by the measure of his desire to secure the contract in question; in fact, it is doubtful if the same contractor would bid exactly the same on different occasions.

even for precisely the same structure. Moreover, if these variations are encountered in obtaining the cost of a given building in a given place, still wider differences will arise in obtaining bids for different localities where the price of material and conditions of labor are different. For this reason a certain amount of discrepansy between different authorities must be accepted as inevitable, and must not be allowed to throw suspicion on the figures."

In order to arrive at some definite figure which would fairly and equitably set forth the difference in cost of these various types of construction, the general average of all five bids was taken, in addition to the two most favorable bidders as shown in the tables below:

COMPARATIVE BIDS.

AVERAGE FIGURES.

Type	Description	Average Bid	Excess Over Clapboards	Percentage Excess Over Clapboards
No. 1	Clapboard	$6,759.95		
No. 2	Shingle	6,868.80	$108.85	1.6
No. 3	10-inch Brick Wall — Hollow	7,372.48	612.53	9.1
No. 4	12-inch Brick Wall — Solid	7,641.00	881.05	13.0
No. 5	Stucco on Hollow Block	7,187.65	427.70	6.3
No. 6	Brick Veneer on Hollow Block	7,483.16	723.21	10.7
No. 7	Stucco on Frame	6,952.90	192.95	2.9
No. 8	Brick Veneer on Boarding	7,226.44	466.49	6.9
No. 9	Brick Veneer on Studding	7,153.98	394.03	5.8

COMPARATIVE BIDS.

AVERAGE OF THE TWO MOST FAVORABLE BIDS.

Type No.	1	2	3	4	5	6	7	8	9
Description	Clapboard	Shingle	10-inch Brick Wall Hollow	12-inch Brick Wall Solid	Stucco on Hollow Block	Brick Veneer on Hollow Block	Stucco on Frame	Brick Veneer on Boarding	Brick Veneer on Studding
No. 1	[illegible]	[illegible]	$7,118.00	$7,418.00	$7,179.00	$7,238.00	$6,847.50	$6,970.00	$6,895.00
No. 5	[illegible]	7,450.00	7,940.00	8,240.00	7,650.00	7,990.00	7,650.00	7,790.00	7,710.00
Average	[illegible]	7,118.00	7,529.00	7,829.00	7,414.50	7,614.00	7,248.75	7,380.00	7,302 50
Excess over Clapb'ds		[illegible]	458.00	758.00	343.50	543.00	177.75	309.00	231.50
Percent Excess Over Clapb'ds		[illegible]	[illegible]	10.7%	4.9%	7.7%	2.5%	4.4%	3.3%

Mr. Fiske in speaking of the two most favorable bids says:

"The two concerns referred to in the last table were very well prepared to make an accurate comparison on this particular kind of building. Mr. Joslin, of the McDonald & Joslin Company, has made a thorough study of estimating different types of small house construction for years. Their figures, like all the others, were prepared absolutely independently, and while they vary considerably in the totals, their percentage difference between the different types is in remarkably close agreement."

In making up his figures, Mr. Joslin used the following:

PRICE OF MATERIALS

Lime	$1.00 per bbl., 200 lbs.
Portland Cement	$1.60 per bbl.
Spruce Framing	$26.00 per M. ft. B.M.
North Carolina Pine	1c. per inch per ft.
Georgia Matched Pine (1st quality)	$75.00 per M. ft. B.M.
Shingles	$4.75 per M.
Clapboards	$55.00 per M.
Hemlock Boarding	$22 per M. ft. B. M.
6-inch Hollow Blocks	10½c. per sq. ft.
8-inch Hollow Blocks	14c. per sq. ft.
Face Brick	$17.50 per M.
Common Brick	$9.00 per M.
Allowance for Furring, Lathing, and Plastering	5c. per sq. ft.
Wages of Bricklayers	60c. per hour.
Wages of Carpenters	50c. per hour.

The cost of lumber displaced by brick on Types 3, 4, 5 and 6, would be as follows:

Frame and Studding, 2,300 ft. B.M., at $26 per M.	$59.80
Square Edge Boards, 2,500 ft. B.M., at $22 per M.	55.00
Spruce Clapboards, requiring for manufacture 600 ft. of stock, B.M.	93.50
Total, 5,400 ft. B.M.	$208.30

These figures may be used in comparison with prices of similar materials and labor in other markets, and by adjusting the differences they could be made applicable in all sections of the country.

Cutting Off Steel Sheet Piling with an Oxy-Acetylene Flame

The data given refer specifically to work observed by the writer where 12-in. U. S. short piling had to be cut off in obstructed spaces. Incidentally other data of similar nature compiled from various sources are given. A brief account of the apparatus used and the general method of operating it will be given first.

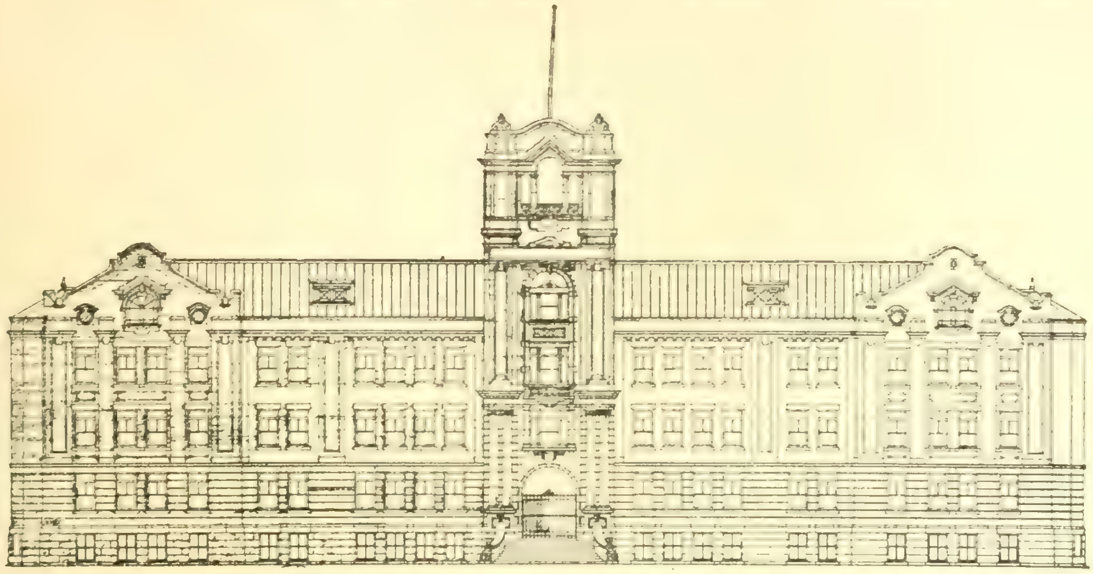
The apparatus made by the National Pneumatic Company for cutting steel consists of a torch which has a tip containing two pairs of small holes for the oxy-acetylene heating flame and a fifth hole in the centre which supplies the oxygen to the metal after it is heated. The presence of oxygen in contact with the heated steel oxidizes or burns it up rapidly. The oxygen used with the acetylene flame is merely to increase the temperature of the flame. This flame has a temperature of about 6300 deg. F. The two gases are supplied in the ratio of about 1.3 parts oxygen to 1 part of acetylene.

In operation, the torch is moved along the cutting line and the metal is heated white hot, then the main oxygen valve is opened and a small stream of oxygen at 50 lbs. pressure is blown upon the hot surface. The oxygen unites rapidly with this steel at this temperature forming oxide of iron which runs molten from the cut. It requires 0.38 oz. of oxygen per ounce of iron to form the oxidized iron. The tanks of oxygen are supplied with 100 cubic feet of oxygen at atmospheric preessure, but when compressed into the tank the pressure is run up to 300 lbs. Each tank, therefore, contains about 143 ozs. of oxygen or enough to oxidize 376.3 cu. ins. of metal, provided no oxygen is wasted. This amount wasted depends to a large extent upon the care taken by the operator and also upon the accessibility of the cut.

Cast iron cannot be cut by this method, apparently because of the high percentage of carbon contained. The rate at which steel can be cut has been found, under shop conditions, to be about as follows:

½-in. steel at the rate of 15 ins. per minute.
¾ to ¼-in. steel at the rate of 1 ft. per minute.
2-in. steel at the rate of 6 ins. per minute.
6-in. steel at the rate of 1 ft. in 3½ minutes.

In cutting the steel it is always desirable to have a cut running clear through the material as it is difficult to cut a channel out of which the molten metal cannot run freely. This condition existed at the LaSalle street tunnel, Chicago. It was decided to leave the 12-in. 35-lb. U. S. steel piling in place to protect the adjoining property. The piles had to be cut off below the strict level, and it was impossible to get at



The St. John's Technical High School at Winnipeg now under construction—Contractor, John Saul.

the piles from both sides. The difficulty lay in having a bank of dirt against the opposite side thus preventing the flame and force of the oxygen from blowing the metal through to the other side. It was always running back and covering the surface which should have been exposed freely to the flame. On this work about 35 piles were cut per 9-hour day, using two outfits and five to six tanks of oxygen. The amount of oxygen used was five or six times that necessary to oxidize the steel cut out.

In this work the two cutting outfits were each handled by one man. Two laborers were used to pull out the short sections of pile after they were cut loose.

An example of great saving by the use of this apparatus was that of the wrecking of Pier 14 on the North River, New York, after its destruction by fire on July 9, 1910. The pier extended about 700 feet into the stream and carried a steel structure 50 feet wide by 700 feet long, containing some 2,000 tons of steel. A Philadalphia firm contracted to wreck it in 30 days, or forfeit $300 a day for each day in excess of that time. It had been estimated that 35 men would be required for the work in the usual way, but it was found that by using the oxy-acetylene apparatus the force could be reduced to 18 men, and the work was completed in 23 working days.

In sinking caissons for the foundations of the Boston Store, Chicago, the cutting name was employed to clear the way of the old steel grillage foundations encountered. Here the method saved a good many hundreds of dollars as it would have been practically impossible to get in with hacksaws.

The method was also employed by the Geo. W. Jackson Company in cutting away members from the elevated railway structure, where changes were being made. The oxy-acetylene flame not only cut about one-third faster than is possible to cut by hand, but in this case the hand process would have been the slow process of cutting a large number of rivets.

Figuring the labor at 30 cents per hour, the oxygen used at 2½ cents per cubic foot, and the acetylene at 1 cent per cubic foot, it is estimated that the cost for ordinary work is 9 cents per square inch.

The outfits for cutting are supplied with different sized tips to suit the class of work, and a trial will soon show the best tip to use. The outfits cost from $650 for the small size to $800 for the largest size.—Engineering-Contracting.

Important School Contracts at Winnipeg

At Winnipeg, work is being resumed on the St. John's Technical High School, the contract for which was awarded last summer to Mr. John Saul, of Winnipeg. The erection of the fine new building illustrated herewith marks an epoch in the educational history of the western capital. When completed, the school will be 220 by 180 feet anad three storeys high, exclusive of basement. It will provide accommodation for more than 1,000 students and will be replete with laboratories, work shops, class rooms, gymnasium, assembly hall, and all the other desiderata of a well designed, well equipped building of this class. At the present time, we are informed, the first storey of brick work has been completed above the basement, all of which was surfaced with cut stone. In addition to this the wooden forms have been erected for the second floor of concrete work so that everything is in readiness for prosecuting the work exepeditiously this season. The contract price for this building was $299,750. For a similar building which is being erected on the Academy Road, Harrow and Kingsway site in the southern portion of the city, by J. H. Tremblay & Company, Limited, the contract price was $299,849.

A new insulating lining brick, designed for use where absolute freedom from dampness is necessary, is so waterproofed and burned that 45 per cent. of the volume is confined air. Its specific gravity is only 0.90, although its ultimate strength in compression is claimed to be 750 lb. per square inch. The bricks float in water and are claimed to be moisture-proof.

A reinforced concrete trestle has been built at Marseilles, Ill., to carry a sidewalk above the grade of the road which it follows. The walk is supported by 9 x 9-in. vertical reinforced concrete posts forming bents, 12 feet on centers, which carry slabs 5 feet wide and 5½ inches thick. There is an expansion joint at every fourth slab.

Compensation of Contractors*

The contractor is the one who is to produce the final result, whether good or bad. It is conceded that a contractor must have the necessary knowledge, ability and facilities, and common business honesty before a proper result can be expected. It is an old saying "You cannot get blood out of a turnip," and every contractor has his personal limitations. Granting, however, that the contractor selected has everything necessary to produce the desired result, the contract requirements will seldom, if ever, be carried out in all cases unless the contractor can earn at least the cost to him of the work. It would seem to many that every honest and capable contractor should be able to earn rightly, the cost of the work, even if he might fail to earn a profit because of delays or failure to economically manage the particular work.

The most important and primary thing for a contractor to know is what assurance the contract provides that he will get out of the work at least as much money as he may be compelled to put into it, plus a possible sum as compensation for his services and knowledge used for the work.

Leaving out of consideration any question of possible profit, contracts may be divided into two groups; first, those in which the contractor is not assured of ever receiving as much money as he may spend on the work and are hereafter referred to as "unsecured-cost" contracts; second, those contracts which assure him at least his cost even if his profit is made uncertain, they are hereafter referred to as "secured-cost" contracts.

The usual forms of contracts can be divided as follows:

- Unsecured-cost Contracts,
  - lump-sum;
  - unit price, with schedule of quantities.
- Secured-cost Contracts,
  - cost, plus a percentage;
  - cost, plus a percentage—where the general contractor takes estimates for sub-branches of work, and then makes lump-sum contracts, with the architect's approval;
  - cost, plus a percentage, with guaranteed limit;
  - cost, plus a fixed sum;
  - cost, plus a fixed sum, with a bonus if cost is less than a fixed sum, and a penalty if it exceeds such sum.

The writer has coined the terms "unsecured-cost" and "secured-cost" contracts because he desires to represent a class of contracts rather than a particular and specialized form, and he has found that, owing to a wide divergence of opinion, the previous use of terms "lump-sum," "percentage," "cost-plus," etc., have been interpreted as being used in too limited a sense.

There are, undoubtedly, special conditions where some one of the various systems given above will be superior to the others, and no one system can be found that will be the best for all classes and conditions of contracting work. The writer is, however, advocating a principle which must underly all contracts, and is not primarily championing the exclusive use of any one special contract.

As the work is purely a business proposition with a contractor, it is evident that, if the cost is not assured by a "secured-cost" contract, the contractor is very vitally interested in anything which may tend to affect the cost of the work, but, if the cost is assured, it is immaterial to a contractor what the contract may require or what changes, modifications, alterations, delays, etc., the owner or his professional adviser may demand.

It likewise follows that under the "secured-cost" contracts the accuracy of the specifications and drawings become of minor importance to a contractor, and the owner, or his professional adviser, can modify or correct them at their pleasure without seriously affecting the rights of the contractor. Under "unsecured-cost" contracts, however, exceptional care should be given to make specifications and drawings complete, clear and accurate, because, if this is not done, how in the name of reason can a contractor be expected to make an accurate "lump-sum" estimate, or why in fairness should he be expected to calmly accept changes or corrections which may possibly, if not actually, affect his prospective profit?

It certainly should be evident that if, for any reason, the specifications and drawings cannot be made complete, clear, and accurate, the work should be executed under a "secured-cost" contract, and that only in such cases where it is not only possible but where specifications and drawings have actually been made complete, clear, and accurate should any fair-minded man ask a contractor to accept an "unsecured-cost" contract.

---

*Extract from report of "Special Committee on Uniform Specifications" of the American Society of Engineering-Contractors.

Use of Rock Asphalt

Rock asphalt slabs, laid upon a concrete base 4 to 5 inches thick and surfaced with a thin coating of pure rock asphalt, heated and spread with a wooden float, have recently been put down on Thomas street between Broadway and Church street, New York city. The rock asphalt is mined in Switzerland and after being ground to a powder and heated it is placed in molds and subjected to 3,000 lb. per square inch pressure. The slabs formed by this process are 10 inches square and 1¾ inches thick. In laying pavement a ¼-in. cushion of cement and sand, mixed dry, is placed to support the slabs and level up any inequalities in the concrete base. When the slabs are laid and levelled the entire surface is sprinkled with water which penetrates the joints and enables the cement underneath to set up. The last stage in the construction consists in applying a ¼-in. surfacing coat of hot rock asphalt which is dusted with dry cement. The pavement thus formed, which was put down for the property owners along Thomas street by the Neuchatel Asphalte Company, of New York, is said to afford a sure foothold for horses and to be particularly adapted to streets carrying heavy traffic when a great deal of backing and turning on trucks is necessary. The pavement is laid under a 10-year guarantee. Portions of the thin surface coating are replaced from time to time at they wear out.

The British engineering papers are reporting the following performance in metal cutting: One man employed by the Knowles Oxygen Company, Limited, cut through 42 girders, 15 x 5 in. section, in 4¾ hours, with a consumption of less than 200 ft. of oxygen and 300 ft. of hydrogen. Reckoning labor at 1 shilling per hour the cost figured out 6 pence per cut.

A Toronto man is so much impressed with the versatility of City Engineer Rust that he wrote to him last week asking his advice upon a dentist's bill, in which he claimed to have been over-charged.

Trade Looking Up at Ottawa

Architects and Contractors Assured of an Active Season — Labor and the Supply Market

Ottawa, April 29, 1911.

Ottawa has again suffered this spring from a shortage of clay brick supply. The different brick plants in the vicinity of the city made brick as fast as possible last year but were only able to catch up with their orders when the season was at an end. Accordingly, there was little or no brick carried over the winter and therefore none to begin spring operations. Last year the early demand was supplied by importing brick from the surrounding towns but they in turn were nearly all drained and this could not be repeated this year. Accordingly there has been a marked scarcity, this having been somewhat lessened, however, by the lateness of the building season. The Peerless Brick & Tile Company has brick for the first of May. This has been made possible this year by indoor methods of manufacture and artificial drying. This company is also making fireproofing this year. They made a little last summer but this season they will go into it extensively. Practically all the fireproofing used in this city in the past has been imported.

There has been much greater activity in the building operations during the past week than before. Tenders have been called for the new apartment house of J. A. Seybold, for which Horwood, Taylor and Horwood are the architects. This building will cost around $90,000. It will be of brick and of slow-burning construction. It will be a most modern building, replete with all the latest improvements. Donald Fraser is also building a large apartment house on O'Connor street on which the contractors are figuring this week. Tenders are also being called for the new theatre to extend from Sparks to Queen street, of which C. P. Meredith is the architect. Besides these there are a large number of expensive residences now in the architects' hands.

The commencement on the large commercial building to be erected on Elgin street, on the site of the First Congregational Church, has been somewhat delayed on account of difficulties in the transfer of ownership to Mr. Gordon Stewart. These, however, are only temporary and it is expected that the work will soon be under way.

The bricklayers and masons begin working 8-hour days after May 1st, with wages at 52 cents an hour. This has led to some complications with regard to builders' laborers. They, with the exception of those who work with carpenters, will only be able to work eight hours, also, and they are asking for an increase form the usual 25 cents an hour. Two meetings between the builders and the laborers have been held and no agreement reached. However, it is practically certain that it will be settled amicably.

The teamsters are still getting $4.50 a day for team and man, nine-hour day. Howveer, the city is paying $5 and it is expected that the buildings will have to pay more, but not as high as the city. The ordinary laborers, that is, those mixing concrete, and excavating, will be paid from $1.75 to $2 a day. This is a slight advance.

There is every probability that the work of construction of the electric railway from Morrisburg to Ottawa will be begun this summer. All the surveys are completed and the organization of the company will be completed very soon, the necessary capital having been secured.

There is a general move to have the tunnel question decided within a few weeks. It is holding back railway and industrial operations. The C. P. R. officials state that they are ready to begin the construction of the tunnel this summer if the question is decided. It is estimated that the work will take two years and cost $1,500,000.

Erection of churches will be an important part of the building operations in Ottawa this year. Besides the Bethany Presbyterian and First Congregational, there are the new Roman Catholic Church in the Glebe, the Westminster on a site yet to be decided upon but for which several options have been taken, and the large additions to Notre Dame Church in Hull. V. Ladouceur, of Ottawa, has been awarded the contract for erecting the towers for Notre Dame Church and Trudel & Adams will install the fire escapes.

New Apartment House at Montreal

Mr. W. H. Creed isbuilding two fireproof apartment houses that contain some unique features. The largest will be on the Cote des Nieges Road. It will have a frontage of 135 feet and a depth of 175 feet. The structure will be five storeys high in the front and four in the rear. It will be of reinforced concrete and steel, faced with pressed brick and Indiana limestone. It will contain 33 suites of rooms and will be ready for occupation in May, 1912. The property, including land, will cost $200,000. Mr. Creed is putting in a vacuum cleaner plant that will be connected with every suite in the building. He is also arranging for all refuse to be conveyed to an incinerator in the basement. The heat so derived will help provide hot water for domestic purposes throughout the house. The name of the house will be "The Gloucester." The architect is Mr. Joseph Perrault. Mr. Creed is also building a smaller apartment house in the city with the same vacuum and incinerator features, to be known as the "Shaftsbury." This will contain 32 suites and will cost, wtih the land, $70,000. This will be ready for occupation in July.

Great Plant for Port Arthur

Mr. J. C. Wallace, of the American Ship-Building Company, of Cleveland, Ohio, who is interested in the Western Dry Dock and Ship-Building Company, of Port Arthur, announced recently in the latter that the Western Dry Dock and Ship-Building Company would immediately start work on the erection of an additional plant to manufacture stationary, marine, and locomotive boilers, engines, pumps, etc. He also stated that it was the intention of the company to make these works the largest in Canada. The company will build docks. A large amount of machinery will be required. The contract for the buildings as far as known has not been given out, but excavation for the foundation has been started.

The city council of Calgary have calculated the cost of their recently completed city hall, over which there is considerable dispute on the part of the architect and contractor in regard to its completion. The actual outlay was $300,000, twice as much as at first intended.

Following recent investigations in New York, Controller Hocken, of Toronto, estimates the cost of a tube railway for the Queen City at $800,000 a mile. He considert the present a most opportune time for obtaining tenders from American contractors inasmuch as the railways on the other side are curtailing their construction programme this season

The North Lanark Marble & Granite Quarries will exhibit two large pillars of their beautiful Verde antique marble at the coronation festival in London this summer. Samples of the firm's product are shown each year at the Canadian National Exhibition, Toronto, and Lanark marble is universally admired in Canada. The quarries which produce this marble are situated in Darling township, Ontario. The company's office is at St. Catharines, Ont.

Canadian Contractors and Their Work

The Individual and Collective Part Played in the Development of Montreal by the Members of the Laurin & Leitch Firm

Mr. W. C. Leitch was born in Cornwall Ont., about forty-two years ago, and is of Scotch parentage. For a number of years he was with Messrs. Moffatt, Hodgkins & Clarke, waterworks builders, of Syracuse, N.Y. He came to Montreal as general foreman for the Montreal Water & Power Company and later was superintendent for that company. In 1903 he became associated with Mr. James Laurin in general contracting work under the name of Laurin & Leitch.

James Laurin

Mr. James Laurin was born in Montreal in 1863 and educated at the Commercial Academy and the Ecole Polytechnique, graduating from the latter as an engineer in 1884. He then became employed on railway construction work in New York State. Returning to Quebec he worked for H. J. Beemer, a railway contractor who built several railway lines in this province, including the Montreal & Western line, now the Labelle branch of the C. P. R. Mr. Laurin next entered the employ of Mr. J. E. Vanier, engineer and architect, and was head clerk in his office for about twenty years, leaving it in 1903 when he joined Mr. Leitch in the firm of Laurin & Leitch

Mr. W. C. Leitch

Mr. James Laurin

Mr. Treffle Bastien

T. Bastien

Mr. T. Bastien was born in Montreal fifty-four years ago and was educated in the St. Laurent College. His father was the late ex-Alderman Benoit Bastien, who was a prominent resident of St. Vincent de Paul in the county of Laval and represented that county for some years in the local legislature.

Mr. Bastien commenced business as a building contractor when about twenty years of age. In 1889 he associated himself with Mr. Alphonse Valiquette, carrying on business in municipal contracting in Montreal and suburbs. A few years later Mr. B. Bastien joined the firm, which had successfully carried out a number of extensive contracts, including the construction of waterworks systems and other municipal projects. Among the works entrusted to them may be mentioned sewerage, paving and macadamizing for the city of Montreal. They put down most of the permanent sidewalks in Ste. Cunegonde and built most of the sewers in St. Louis, Ste. Cunegonde, Maisonneuve, Lachine and Valleyfield. Upon the death of Mr. Benoit Bastien, the firm of Bastien & Valiquette was dissolved, Mr. Valiquette retiring altogether from business in 1905.

In 1906 Mr. T. Bastien joined the firm of Laurin & Leitch, since when the firm has carried on very extensive operations in municipal and other contracting. Mr. Bastein has interested himself in municipal affairs in Montreal for many years. In February, 1904, he was elected to represent St. James' Ward for a two-year period and after being out of the council for a term was re-elected a year ago to represent the newly-annexed Ward of Ahuntsic. Mr. Bastien is very conversant with financitl matters and his extensive experience in business affairs makes him a very capable and useful alderman.

Since 1903 the firm of Laurin & Leitch have undertaken contracts to a total value of over $5,000,000. Their enterprises include the construction of a sewer system, permanent sidewalks and permanent street paving for the town of St. Louis, now Laurier Ward; municipal works for the city of Montreal; a new pipe line, reservoir, pumping plant, and other extensive improvements for the Montreal Water & Power Company; water supply systems for the Singer Sewing Machine Company of St. Johns, Que.; and for the Canada Car & Foundry Company, Limited, of Montreal.

The Winnipeg City Planning Association will probably send delegates to the convention of the National Town Planning Association, which is to be held in Philadelphia, May 15-17. Mr. W. Pearson is chairman and Mr. N. T. MacMillan, vice-chairman of the Winnipeg Association.

Progress News of Construction

The contractors for the Hudson's Bay Company's proposed new building in Calgary, the Carter-Halls-Aldinger Company, of Winnipeg, have been offered a bonus of $50,000 for the completion of the building by October 1st.

The contractors for the Calgary street railway had to let off about 125 men last week for lack of steel, according to Superintendent McCauley. Contracts for the steel were let last November. Delivery was to be made by April 25. Gorman, Clancey & Grindley, local agents, who had part of the contract, had their steel delivered a month ahead of time.

Good progress is being made by the Randolph Macdonald Company, Limited, Toronto, on the contract for the Hastings lock dam and dredging, on the Trent Canal. The past month witnessed the completion of the lock and approach walls. Mr. Arthur Stephen, C.E., is in full charge of the work. The company expect to complete, this season, the Rosedale section of the Trent Canal and dredging at Cornwall, Ont.

MacArthur, Perks & Company, Limited (G. W. Volckman, vice-president and general manager, Ottawa), have commenced the construction of extensive docks at Havana, Cuba. The work is being supervised by Mr. Aldridge Durant. Features of interest in this work will be the reinforced concrete pile work for the substructure and reinforced concrete dock shed and warehouses for the superstructure. This work is the first section of the Port of Havana Dock Company's new docks. It consists of two concrete piers, about 650 feet long, extending out into the harbor. The complete scheme will involve two more similar piers, all of which will accommodate the largest vessels.

Good progress is being made on the new ship canal at the works of the Port Credit Brick Company, Port Credit, Ont. The canal will be about 16 feet deep and 100 feet wide and will permit of the passage of lake freighters to the company's shipping docks. Upon the completion of the canal the greater part of the company's shipping will be done by water. During the last few years the Port Credit Company has pursued a continuous plan of improvement and the plant is now considered one of the most complete and up-to-date on the continent. The present improvements will make the shipping facilities second to none.

The Parsons Construction & Engineering Company, Limited, Regina, Sask., are proceeding expeditiously with operations on the overhead bridge at Calgary, Alta., and also with the construction of the Kerr Block, Regina. Mr. W. R. W. Parsons, Mem. Can. Sos. C.E., is superintending the work. Good progress has been made on both contracts during the past month. On the former, five abutments and bridge seats were completed, also concrete footings for 60 timber bents for approaches. On the Kerr Block the excavation (50 by 100 ft.), was completed, also the footings and foundations to ground level. Steel is erected for the first floor and all materials are on the ground.

Toronto's public works, under way and projected, involve a sum of no less than $26,513,603. The largest items are the hydro-electric system, $2,750,000; railway viaduct, $9,000,000; trunk sewer, $2,400,000; general hospital, $2,600,000; street widening and extensions, $1,322,852; storm sewers, $824,400; filtration plant, $600,000; school buildings, $503,000, and new wing for the Parliament Buildings, $500,000. The indications are that 1911 in Toronto will be the busiest season ever experienced in any Canadian city.

At a recent meeting of the Manitoba Good Roads Association at Winnipeg, a special committee was appointed to interview the provincial government with a view to obtaining further assistance in road construction and maintenance. An interesting address on Oiled Roads was delivered before the association by Mr. Victor C. Parker, who gave the cost per mile as $1,425.60, this to include grading, facing, harrowing and rolling, and afterwards treating with oil. The annual cost of maintenance was estimated at $186 a mile.

Preliminary Work for the Dry Dock at Montreal

No time will be lost in the installation of the proposed dry dock at Montreal. It will be situated at Molson's Creek, some three or four miles below the present harbor. All the summer dredging and other work in this connection will be proceeded with as rapidly as the latest engineering facilities will admit of. A large basin 50 feet in depth will be dredged out along with the necessary approach to the river channel. Quay walls will be constructed and some twenty acres or reclaimed land will be filled in. It is expected that everything will be in readiness for the reception of the 27,500 ton floating dry dock by May of next year. In addition to this a large shipbuilding and ship-repairing plant will be constructed, capable of making all ordinary repairs to both ocean-going and inland vessels. Engine and boiler shops and foundries will be established. Several new features will be adopted in the construction of this dry dock so as to make it adaptable to the Canadian climate. These features are the outcome of deliberations between Mr. F. W. Cowie, Chief Engineer of the Montreal Harbor Commission, and the builders. One special feature will be the provision of a suitable heating system which will prevent the big plant from being frozen up during the winter season. It is understood that this plant will be of the highest type of design and construction that can be produced.

Montreal Harbour Improvement.

The dry dock will be built on the other side of the Atlantic by Messrs. Vickers, Sons & Maxim. The company will receive a subsidy from the Canadian government of three per cent. interest on $3,000,000 for a period of thirty-five years. This is a first-class subsidy under the Graving Dock Subsidies Act.

The Lock Joint Pipe Company, New York, which has extensive contract at Toronto, Hamilton, Regina and Saskatoon, is in the market for second-hand locomotive boilers on wheels.

The ratepayers of Saskatoon, Sask., will vote upon a by-law authorizing the expenditure of [illegible] for the construction of a fireproof unit hospital, equipped with a central heating plant.

Personal Mention

[illegible] A. [illegible] C.E., of Ottawa, returned home recently [illegible] visit to Great Britain and the Continent.

Mr. A. F. Stewart, chief engineer for the C. N. R., has returned to headquarters at Toronto after spending a vacation in the Adirondacks.

David Wilson, of the firm of Mitchell & Wilson, building contractors, Gananoque, Ont., died of blood poisoning on April 14, following a recent injury to his hand.

At Halifax, N.S., on April 20th, Mr. C. D. Howe, of Dalhousie University, addressed a meeting of the Nova Scotia Society of Engineers upon the subject of Reinforced Concrete.

City Engineer Thompson, of Seattle, Wash., has been invited to confer with City Engineer Davis, of Prince Rupert, in regard to the installation of waterworks and sewers. The estimated cost of the projected work is [illegible]

Messrs. E. M. Nesbitt and Thos. H. Miller, formerly members of the Edinger Nesbitt Construction Company, Limited, Edmonton, Alta., have formed a partnership as general contractors and have opened offices in the Archibald Building at Edmonton.

Mr. Daniel E. Moran has resigned as vice-president of the Foundation Company, New York, to enter private practice as consulting engineer at 55 Liberty street, New York, giving special attention to foundations. He will continue to act as consuitlng engineer for the Foundation Company.

A notable visitor at Vancouver recently was Mr. John Coates, formerly of Ottawa, and now inspecting engineer in England for the Australian government. Mr. Coates is president of John Coates & Company, Limited, contractors for gas works. It is stated that the company is thinking of establishing a branch in Vancouver.

Applications closed recently for the post of city engineer of London, Ont. Among the applicants were M. W. Wilber, resident engineer, New York State Highway Commission, and S. S. Dawson, an English engineer now at Alexandria, in Egypt. The post, which is worth $3,000 a year, will probably go to the Acting City Engineer, Mr. Wright, who has been assistant for some years and who has deputized with much satisfaction.

Of the twenty-nine candidates who wrote in the final examination for the British Columbia land surveyors, the following passed, and are entitled to commissions: Messrs. B. C. Affleck, J. C. Agnew, A. W. Ashton, R. P. Bishop, H. N. Clague, F. J. P. Cond, J. R. Graham, R. W. Haggen, J. Heathcott, M. W. Hewett, H. Idsardi, G. J. Jackson, J. L. King, G. H. McCallum, W. Meyerstein, J. F. Nicoll, W. H. Powell, F. Reynolds, R. G. Russell, K. C. C. Taylor and D. O. Wing.

Mr. Fred L. Fellowes, who recently resigned the position of City Engineer of Westmount, left on April 24th to take up a similar position in Vancouver, B.C. He was given a most cordial send-off from Westmount as he boarded the Imperial Limited train at 10.30 in the evening. Mr. Fellowes was presented with a souvenir in the form of a well-stocked travelling bag, the gift of a few intimate friends. The best wishes of a large circle of friends and acquaintances go with him to Vancouver.

Prior to his association with the B. C. Department of Public Works, which began about thirty years ago, Mr. Gamble, the newly appointed Deputy Minister of Railways for British Columbia, served in the location and construction of Canadian railways. His last connection in this field was as assistant engineer on several contracts of the Canadian Pacific Railway. In 1881 he became assistant to the government agent in the Department of Public Works of British Columbia, and was thereafter reisdent engineer and agent of the department, having charge of all harbor and river improvements and the erection of public buildings, and later engineer in charge of all public works.

Canadian City Engineers

M. E. Brian, Windsor, Ont.

The present city engineer of Windsor, Ont., was born in that city on October 11th, 1882. He received his early education in his home town and in 1900 was articled to Messrs. Newman Bros., civil engineers. After serving an apprenticeship for three years with this firm he entered the School of Practical Science, from which he graduated in 1906, taking the degree of B..Sc. in 1907. His early professional experience was obtained as assistant city engineer of Windsor and also in the office of J. J. Newman, where he had a good insight into drainage work and general practice. He qualified as an Ontario land surveyor in 1906 and became an associate member of the Canadian Society of Civil Engineers in 1909. He was appointed to his present position on January 1st, 1909.

City Engineer Brian, of Windsor, Ont

A syndicate said to possess a large amount of capital has purchased a tract of land just to the east of the city of Montreal, near Dominion Park, belonging to what is known as the Baylis property, and covering an area of 387 acres, for a price said to be nearly $1,000,000. Sir Thomas Shaughnessy is said to be allied with a number of English and Scotch capitalists in this deal, and it is further stated that their intention is to build almost a hundred houses, as residences for mechanics and artisans. They will also encourage manufacturing establishments of various kinds. The property, which has a frontage of 960 feet on the River St. Lawrence, runs back a distance of about three hiles. The new syndicate purchased this large tract from the Lyall Realties Company, Limited. The House of Brown, Limited, are agents for the Lyall Realties, Limited.

Canadian Railroad Development

A. and W. D. Wheaton have moved their outfit from Amherst, N.S., to Smith Falls, Ont., to do some double track work at the latter place.

Tobin & Larson have been awarded the contract for building 14 miles of railroad from Beaver Creek to Pincher Creek, Alberta. This is the first railroad into the district, but it is said that three other lines are to be built later.

The following contracts were awarded at Calgary for improvements to Alberta Division of the Canadian Pacific: Red Deer roundhouse, Dominion Equipment & Supply Company, Winnipeg; five standard No. 5 stations at Tompkins, Suffield, Burdett, Bow Island and Redcliffe, J. E. Lussler, Medicine Hat; six stall engine house addition at Red Deer, Carter, Halls, Aldinger Company, Winnipeg; No. 1 Bunkhouse, Red Deer and Calgary, G. M. Eaton, Strathcona; extension to Medicine Hat depot, brick and stone, G. E. Lussier, Medicine Hat.

The Canadian Northern Railway is planning for a busy season, and already has engineering parties in the field running lines and laying out work ready for the graders; the contractors are also busy oragnizing their forces to commence work as soon as the weather permits. Among the firms which have already secured large contracts are the Northern Construction Company, Union Construction Company, McMillan Bros. & Kenny, and M. McCrimmon. It is understood that further contracts will be awarded in the course of a few days. It is expected that between 300 and 400 miles of new grade will be completed this year on the main line, and between 400 and 500 miles on various branch lines, in addition to which a large amount of work will be done on existing lines, ballasting and relaying with heavier steel.

The Railway Committee of the House of Commons has favorably reported the bill extending the time for the construction of the Quebec & New Brunswick Railway Company, which proposes to build a line of railway from Levis to St. John. It was agreed that the capitalization of the company be increased from $900,000 to $2,000,000.

G. T. R. Operations at Toronto

The Grand Trunk Railway has placed two steam shovels at work on its $2,000,000 improvements in the west end of Toronto extending to Mimico. Plans for the proposed subways at Indian road and Howard Avenue have been submitted to the city engineer and are awaiting the approval of the city before commencing their construction. These are to be of solid concrete and have ornamental parapet fences. The structures are designed to present a handsome appearance. One of the steam shovels is working at the Exhibition grounds and the other resumed operations at Dowling avenue, where it ceased work last autumn. Four tracks will be laid from Bathurst street to Mimico, instead of the two tracks formerly in use. A cut which will be 30 feet deep at Dufferin street will be made in front of the Exhibition grounds and the tracks depressed. A retaining wall will be constructed between the tracks and Dufferin Park. The city will leave the tracks at the park at the present level. Workmen have started to remove the old buildings along the northern wall of the Fair grounds and will place at this point additional tracks in accordance with the plans approved by the Railway Commission. The Grand Trunk will start the depression of its tracks on the eastern limit of the Exhibition grounds, and these will not come up till Sunnyside is reached. At that point the viaduct will be begun. The company will have a grade of four-tenths of one per cent. from Bathurst street to Mimico. The revised plans for the bridge over the Humber river provide for two abutments from a central pier, each 100 feet long. Beneath are no impediments and the structure will be 18 feet above the water. It will have a modern solid ballast floor, so that no water can drop through. The width is to be 55 feet. The cost will be $250,000 to $300,000. The bridge over the Mimico river will consist of one span about 100 feet in length. It will be of the same style as the Humber river bridge, except that it will have open flooring. In all subways will be erected over fourteen crossings, and four overhead bridges will be constructed. The bridges are to be at Dufferin street and Dunn, Jamieson and Dowling avenues.

Survey Work for the Hudson Bay Road

An engineering corps of 17 men who had been engaged in the surveys for the Hudson Bay railroad, reached Winnipeg last week. This party, under the charge of F. P. Moffatt, left Winnipeg last May for Split Lake via Nelson river and Manitou rapids and commenced work at the portage between Landing lake and Winter Camp lake. About twenty miles from this point the lines part, one going to Churchill, the other going to Fort Nelson. The party continued on the line of survey from this point toward Churchill for a distance of 70 miles and spent Christmas at Split lake. On December 26 the party with 15 dog teams commenced the journey south toward civilization again and during their trip to Thicket Portage they encountered the coldest weather ever experienced by any of the old-timers of the party, the mercury staying at from 46 to 56 below zero for a period of three weeks. The line was then located south from this point for about 60 miles to Crooked river and the party left this place for Le Pas March 24 and arrived there March 31. From this place they caught the first glimpse of civilization after being away almost one year. The men enjoyed splendid health during the entire trip. About two weeks before Christmas the party came across the survivors of the ship Jeanie, which was wrecked in Hudson Bay last fall and whose crew later arrived in Winnipeg. The winter was very mild and open with the exception of a very cold snap about the beginning of the year. One of the inconveniences which was experienced by the party was the incessant rainfall which commenced about the middle of June and continued until September.

The Canadian Pacific counts on an outlay of $5,000,000 in Calgary this year, the chief enterprises being the buildings and dams for the $3,000,000 hotel. The Canadian Northern, which is laying its tracks and preparing for the city station, freight sheds and shops, estimates an expenditure of $1,500,000 in Calgary the coming summer. The Grand Trunk Pacific will have reached Calgary, it is expected, by September. W. A. Lowry, superintendent of the company's town sites, makes the announcement that before the end of the year the G. T. P. will have nine branch lines radiating from Calgary.

W. H. Martin & Company, Toronto, contractors and planing mill operators, are reported to have assigned with assets and liabilities about even at $50,000.

Trade Notices and Business Notes

Contractors and others will be interested in the Finger Ring Level, manufactured by the Kokomo Level Company, of Kokomo, Ind. This useful instrument should appeal strongly to bricklayers, cement block, fence and [illegible] workers. It is worn on the hand while at work and enables its possessor to level up his work instantly and accurately as he lays it. A single glance at the level ring on the finger is sufficient and no loss of time is occasioned, as is the case in the adjustment of an ordinary level. This

(Continued on page 64)

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Battleford, Sask.

Wm. Kitson has been engaged as resident engineer to make plans for and superintend the installation of an up-to-date system of waterworks and sewerage disposal plant. As the law now prohibits the discharge of sewerage into rivers it will be necessary to make considerable alterations in the original scheme of drainage prepared by Messrs. Galt & Smith and to devise

Deseronto, Ont.

Tenders are called until June 4th for the sale or exchange of equipment for municipal pumping plant L. E. Allen, consulting engineer, Belleville. Advertisement in "Tenders and For Sale Department" of this issue.

Fort William, Ont.

Tenders for supply of sand and gravel required for the year 1911 will be received at the office of the city clerk nutil May 11th. John Wilson, city engineer.

Tenders are also called for same date for supply of 10,000 bbls. of cement.

Tenders addressed to the Chairman of the Utilities Committee will be received until May 11th for supply of the following waterworks material: 500 service boxes; 200 extra caps; 300 extra screws; 28,000 lbs. of ½ in. and 1 in. lead pipe. John Wilson, city engineer.

Fairville, N.B.

The municipality of St. John are calling for tenders for the furnishing of vitrified salt glazed sewer pipe for this village. All tenders must be addressed to J. King Kelley, the County Secretary, 108 Prince William street, and will be received until May 12th. G. G. Murdoch, engineer.

Hull, Que.

The Hull city council will call for new tenders for the Britannia street sewers.

Kamsack, Sask.

It has been decided to take active steps to instal a water and sewerage system.

Lachine, Que.

Tenders were called until May 3rd for supply of drain pipes; construction of brick sewer. H. Robert, secretary-treasurer.

Moose Jaw, Sask.

The board of works have recommended that tenders for sidewalks be submitted to council not later than May 29th. W. F. Heal, city clerk.

The sewer and water committee have recommended that the city engineer be instructed to purchase six American water meters and also write for competitive prices for a horizontal turbine pump.

Melville, Sask.

The by-law for storm water sewer, $5,000; waterworks, $63,000, was carried.

North Bay, Ont.

The ratepayers will vote on May 29th to provide for raising $100,000 for extension of waterworks system and for purchase of electric pump and completing reservoir.

North Toronto, Ont.

Tenders addressed to Frank Howe, chairman of works committee, Eglinton, will be received until May 15th for construction and supply of material for main sanitary pipe sewers; construction of manholes, etc. T. Aird Murray, consulting engineer, 303 Lumsden Building; A. I. Brown, mayor. Advertisement in Tenders and For Sale Department" of this issue.

Niagara-on-the-Lake, Ont.

This municipality have under consideration the installation of a waterworks system. Total cost about $21,500.

OKotoks, Alta.

Tenders addressed to Secretary- Treasurer, will be received until May 22nd for construction of cement walks here.

Ottawa, Ont.

The new Sparks street pavement, which it was expected to have put down as the first work this year, will not be started till after exhibition week in September. It is then proposed to put day and night gangs to work so that it will be completed before the winter.

Owen Sound, Ont.

Tenders addressed to J. K. Leslie, chairman, Board of Works, will be received until May 5th for construction and supply of tile sewer pipe for a distance of about 2,600 feet. Plans, etc., at office of the town engineer, R. McDowall, C.E.

Port Arthur, Ont.

A by-law will be submitted to the ratepayers on the 29th of May to authorize the extension of the intake pipe for 2,000 feet beyond the new breakwater. The city engineer was authorzied to make surveys of Hazelwood lake as a possible source of water supply. These improvements and the building of another stand pipe will cost about $100,000.

Ridgetown, Ont.

The by-law to spend about $35,000 on the waterworks system carried. The water supply comes from artesian wells. F. W. Farncombe, London, C.E., drew the plans.

Renfrew, Ont.

On May 10th three by-laws will be submitted to the voters for approval—$3,000 for sewerage, $25,000 for local improvements and $3,200 for bridge construction. A. T. Lawson, clerk-treasurer.

Scotstown, Que.

This municipality will install waterworks and sewer systems. L. A. Dufresne, Sherbrooke, engineer in charge.

South Vancouver, B.C.

This municipality will call for tenders for 42 miles of 4-in. and 8 miles of 6-in. steel pipe. Besides this, tenders will be shortly invited for supply of 45,000 feet of half-inch and 20,000 feet of ¾-inch galvanized iron pipe; for 4,400 brass cocks, 300 fire hydrants, as well as special castings and pig lead. Superintendent Mullett.

Saskatoon, Sask.

In view of the fact that the intercepting sewer will not likely be ready until next summer City Engineer Clark has recommended that the work on the disposal plant might be well left over until next year. It is expected, however, that the plans for this work will all be completed by the fall of this year, and the tenders advertised for the work early in the spring.

Scott, Sask.

The ratepayers will vote on May 8th on the following: $20,000, waterworks; $15,000, sewers; $5,000, street improvements.

St. Mary's, Ont.

Mr. B. F. Brooke, sanitary engineer, of Toronto, is at work making a survey for the proposed sewage system.

St. Lambert, Que.

Tenders addressed to J. R. Beatty. sec.-treas., St. Lambert, Montreal, will be received until May 8th for following: Contract No. 1, approxmiately, vitrified salt glazed sewer pipe, 3,500 lin. ft. 24 in., 3,100 lin. ft. 18 in., 7,000 lin. ft. 15 in., 7,500 lin. ft. 12 in., 3,000 lin. ft. 9 in., 2,400 lin. ft. 6 in., 56,000 lin. ft. 4 in. farm tile, 110 9 in. running traps vitrified, 110 9 in. square junctions, 60 increasers, 30 18 in. quarter bends, 30 15 in. quarter bends, 30 12 quarter bends. Contract No. 2, approximately 3,000 lin. ft. 48 in. eww shaped concrete sewer pipe, 1,000 lin. ft. 30 in. egg shaped concrete sewer pipe, 20 concrete monhole sections. Plans, etc., at office of J. R. Beatty, sec.-treas., St. Lambert.

Tavistock, Ont.

The village council has adopted the plans of F. W. Farncombe, C.E., London, for the installation of waterworks here which call for an expenditure of about $23,000. Fire protection will be included. The pumps run in connection with the electric plant will have a capacity of 1,000,000 gals. per day with a pressure of 120 lbs. in the mains.

Vancouver, B.C.

The following by-laws will be submitted to the ratepayers on June 10th: Sewer extension throughout the city, $750,000; water extensions in D. L. 301, $115,000; street improvements in D. L.

301, $60,000; water extensions in Hastings townsite, $75,000; opening and rough - grading of streets, Hastings $75,000; rocking, grading and planking streets (general), $100,000; waterworks extension on Seymour creek, $100,000; Clark drive street-end widening, $35,000.

Welland, Ont.

A by-law to spend $75,000 for the erection of a new pump house and additions to the Welland waterworks was carried.

The expenditure on the new pumping station will be as follows: Water wheel and pump, $15,000; 16-inch flexible pipe crossing river, $2,000; 16-inch main from pump house to Young street, $5,400; building (say) $10,000; excavating, concrete work, crane, gates, valves, etc., $31,600; Engineering expenses, $3,000; contingencies, $8,000; total, $75,000.

Winnipeg, Man.

As the result of a meeting held recently between the Good Roads Commissioner and the reeves and councillors of the municipalities of St. Vital and St. Norbert, it is likely that work will be commenced almost immediately on the new asphalt pavement from the city limits past the new agricultural college. The only thing that now remains to be done is the preparation of the necessary by-laws to be submitted to the ratepayers of these respective municipalities for authority to raise the amount required for this purpose. The cost of the new roadway is estimated at $175,000.

AWARDED

Moose Jaw, Sask.

The contract for main drainage works has been awarded to Messrs. Manders Bros., Edmonton. Geo. A. Archibald, Winnipeg, tendered at $129,500; Flanagan & Murphy, Winnipeg, $134,585; Nairn Brothers, Moose Jaw, $143,713; Moose Jaw Construction Company, $149,641; Simplex Concrete Piling & Construction Co., Ltd., Regina, $139,000 on percentage.

Ottawa, Ont.

The following tenders have been received for the west end drainage scheme—Union Construction Company, $165,475, not including rock excavation. For rock excavation, estimated at 31,000 cubic yards, $2.50 per cubic yard or $77,500, making a total of $243,775. The tender of Thomas McLaughlin was totalled $209,438, being divided; $62,188 without rock and $4.75 a cubic yard for rock, making $147,350. The board of control has recommended that Mr. McLaughlin's tender be accepted.

Quebec, Que.

The tenders for the supplies required by the department for the ensuing year were as follows: Clay pipes, tenders were received from the Standard Drain Pipe Co., C. A. Parent and Bosse & Banks, the Standard Co. (accepted); lead pipes and pig lead, tenders were received from the Mechanics' Supply Co., C. A. Parent and Bosse & Banks. The contracts for pig lead was awarded to the Mechanics' Supply Co. and for lead pipe to C. A. Parent; Messrs. Terreau & Racine were awarded the cantract for iron castings. For brass work, the tender of the Mechancs' Supply Co. was accepted, while Bosse & Banks secured the contract for cement.

Only one tender for bricks, that of Paradis & Letourneau, was received and that firm was awarded the contract at $8.50 delivered at the Palais and $9.00 in other parts of the city.

St. John, N.B.

Pollock & Nice secured the contracts except in one instance, for sewer and water excavations, and in this case it was decided that the city should do the work by days' work. There were fifteen tenders for supplying cast iron pipe and the cheques enclosed to cover five per cent. of the cost amounted in the aggregate to over $5,000. The tender of W. H. Thorn & Co. appeared to be the lowest and was recommended to the council for acceptance. The matter of installing a pump at the Lancaster reservoir was allowed to stand over until the next meeting. The tenders were as follows: For excavation in Mill and Dock streets—Pollock & Nice, rock, $8; earth, $2.25. Excavation in Lancaster street—Pollock & Nice, rock, $3; earth ,85c. Pond street excavation—Pollock & Nice, rock, $3; earth, 95c. Clarendon street excavation—Isaac Duffy, rock, $4.45; earth, 68c. Pollock & Nice, rock, $4.25; earth, 70c. Tobias & George, rock, $4.50; earth, $1.25. Nelson street excavation—Isaac Duffy, rock, $6; earth, 98c. Pollock & Nice, rock, $3.50; earth, 80c. Tobias & George, rock, $3.95; earth, 95c. St. John street west excavation—Isaac Duffy, rock, $4.35; earth, 74c. Pollock & Nice, rock, $4.25; earth, 65c. Tobias & George, rock, $4.75; earth, $1.

For cast iron pipe:—MacFarlane Strang & Co.—12 inch, $28.75; 10 inch, $29.10; 8 inch, $29.85; 6 inch, $30.45; 4 inch, $31.30. Robert MacLaren & Co., (Glasgow)—12 inch, $29.10; 10 inch, $29.60; 8 inch, $30; 6 inch, $30; 4 inch, $30.40. N. S. Cast Iron Pipe & F. Co. (Phila.)—12 inch, $29.75; 10 inch, $29.75; 8 inch, $29.75; 6 inch, $30.75; 4 inch, $32.75. R. B. Wood (Philadelphia), (f.o.b. on cars, ex duty)—12 inch, $18.50; 10 inch, $18.50; 8 inch, $18.50; 6 inch, $18.50; 4 inch, $18.50. T. McAvity & Sons, Ltd.—12 inch, $29.35; 10 inch, $29.95; 8 inch, $29.95; 6 inch, $30.35; 4 inch, $31. Vroom & Arnold—12 inch, $28.15; 10 inch, $28.15; 8 inch, $29.15; 6 inch, $30.15; 4 inch, $31.15. D. C. Mitchell & Co. (Glasgow)—12 inch, £6.10; 10 inch, £6.11; 8 inch, £6.12.6; 6 inch, £6.15; 4 inch, £6.17.6. B. S. H. Thompson & Co. (Montreal)—12 inch, $30.30; 10 inch, $30.30; 8 inch, $31.20; 6 inch, $31.20; 4 inch, $31.45. W. H. Thorne & Co.—12 inch, $27; 10 inch, $28.65; 8 inch, $28.65; 6 inch, $29; 4 inch, $29. Watson, Jack & Co. (Montreal)—12 inch, $29.10; 10 inch, $29.50; 8 inch, $30.25; 6 inch, $30.85; 4 inch, $31.75. Staveley Coal & Iron Co.—12 inch, $29.30; 10 inch, $29.65; 8 inch, $30; 6 inch, $30.55; 4 inch, $31.15.

Winnipeg, Man.

The contract for wooden stave conduit for extension of water pipe line was given to J. W. Astley, engineer of construction, at $7.40 per lin. ft. (4,200 ft.), $31,080. M. Peterson, secretary, Board of Control.

Railroads, Bridges and Wharves

Arran, Ont.

Tenders are called by Reeve Arran until May 27th for erection of two concrete abutments and one span Baltimore truss, etc., over the Sauble river. James Warren, D.L.S., Walkerton. Advertisement in "Tenders and For Sale Department" of this issue.

Dartmouth, N.S.

The Public Works Department, Ottawa, is having a survey made of the harbor with a view to building a public wharf here. H. A. Russell, C.E., is in charge.

Edmonton, Alta.

It is reported that tenders for the steel for the east end bridge will be called by City Commissioners at once. The date set for receiving them is May 29th. A. J. Latornell, city engineer.

Halifax, N.S.

Tenders addressed to Hon. C. P. Chisholm, commissioner of Public Works, Halifax, will be received until May 10th for construction of an earth and stone embankment about 2,000 feet long and containing about 45,000 cubic yards. Plans, etc., at local post office or at the office of the provincial engineer, R. McColl, Halifax.

Grandigue, N.B.

Tenders addressed to R. C. Desrochers, secretary, will be received until May 22nd for construction of public wharf here. Plans, etc., at this department and at the office of the district engineers, Chatham and St. John, and on application to local postmaster.

Hamilton, Ont.

The C. P. R. has filed its detail plans of the route of its Guelph Junction and Hamilton railway with the Dominion Railway Commission. The route of the railway swings in a southerly direction after leaving Waterdown, and crosses the G. T. R. tracks ner there. As the track accommodation from the Desjardins Canal bridge to the junction cut is well occupied with the present traffic, a new track will have to be laid. The railway will be begun from the Guelph end in a few days. Vice-president, Mr. McNichol.

Hartney, Man.

Tenders addressed to T. B. Woodhull, secretary-treasurer, will be received until May 22nd for construction of pile bridge with wooden superstructure across the Souris river. Plans, etc., at office of the above.

Huntsville, Ont.

The government wharf will be extended another 200 feet this summer.

Komoka, Ont.

Tenders are called until May 13th for reinforced concrete floor and concrete abutments for a bridge near Komoka. Plans upon application from A Smith, Komoka; F. W. Farncomb, C.E., 64 Bank of Toronto Chambers, London.

Montreal, Que.

J. N. Greenshields, K.C., states that a syndicate has been formed in London for the construction of a railway from the Saguenay River to Cape Charles Bay, on the east coast of Labrador, a point 650 miles from Quebec. Montreal, which will connect with the Quebec and Saginaw line, which M. J. O'Brien will build during the next eighteen months to Murray Bay, 90 miles from the Ancient Capital.

It is officially announced that the Grand Trunk Railway Company proposes to spend between nine and ten million dollars on the improvement of its terminal facilities here. The plans for this [illegible] of the tracks between Bonaventure Station and [illegible] Yards, and from St. Henry to the Point St. Charles Yards. The work as contemplated also includes the erection of new freight and passenger terminals at Bonaventure. The plans for this new station are as yet tentative, as they are to a certain extent bound up with the scheme for the elevation of the tracks. When this scheme has been approved by the city authorities and the Railway Commission the plans for the station will be decided upon immediately.

Nelson, B.C.

At a public meeting at Kalso the amount required to purchase the Kalso and Slocan railway was subscribed and a definite plan formed for reorganization of the line. A new equipment will be purchased, new ore bins and car slips built, and a powerful tug and car barge purchased for service on Kootenay Lake.

Pain Court, Ont.

Tenders addressed to T. B. Carron, commissioner, will be received until May 6th for the following work in connection with the Hind Drain in the Tp. of Dover East and West; construction of four steel highway bridges over said drain. Plans, etc., at office of the Tp. Clerk.

Port Hope, Ont.

Plans and specifications for the new electric light bridge were received. The bridge will be constructed of reinforced concrete; there are three different styles as to the protection on the sides. Tenders for these will be received until the 8th of May.

Prince Albert, Sask.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, will be received until May 22nd work on the south side of North Saskaton the south side of the North Saskatchewan river here. Plans obtained at this department and at the offices of the district engineers, at Edmonton, Alta., Calgary, Alta., and on application to the local postmaster.

Revelstoke, B.C.

The C. P. R. will extend their yards here this summer.

Smith's Falls, Ont.

Engineers have been instructed to begin at once on the location of the C.P.R. line from Glentay, sixteen miles west of Smith's Falls, to Toronto, and it is expected that this railroad will be in operation in about two years.

St. John, N.B.

The C. P. R. and the Street Railway may unite with the provincial government in the erection of bridge on the site of the present suspension bridge, which would be used for railway and general traffic purposes.

Toronto, Ont.

It is announced that the Canadian Northern Ry. has placed orders with the Dominion Steel Corporation and the Soo Company for 105,000 tons of rails. The tonnage represented in these orders alone will lay approximatelv 975 miles. At recent quotations on rails the amount of the two contracts represents an expenditure of $3,250,000. Of this the Sydney company received a contract for 60,000 tons. The order calls for delivery of at least 15,000 tons per month, and all before the close of navigation

Victoria Harbor, Ont.

Steel will be laid on the new railway from Victoria Harbor to Bethany, near Peterboro, this year, anad before the snow flies it is expected that wheat will be hauled from that harbor.

Victoria, B.C.

The city engineer has prepared the necessary plans and estimates for sea wall to be erected at Ross Bay, which will call for the expenditure of about $121,000. Should the work be decided upon a by-law to raise the necessary amount will be submitted to the ratepayers. The wall will be 3,700 feet in length and will be of concrete, the top of the wall to be seven feet above high water mark.

Winnipeg, Man.

See "Business Buildings Awarded."

The Midland Railway has notified tenants on the property which will be required for construction purposes to vacate before June 1st. The agreement concerning entrance has not yet been drafted in its final state. Ald. W. Midwinter, chairman railway committee. L. C. Gilman, assistant to the president, G. N. R.

AWARDED

London, Ont.

The contract for the new C. P. R. roundhouse has been awarded to John Hayman & Son. Approximate cost, $75,000. In addition there is an office building for which tenders have not yet been awarded.

Public Buildings, Churches, Schools, etc.

Abaujagne, N.B.

Tenders addressed to Rev. H. D. Cormier, parish priest, will be received until May 6th for remodelling and enlarging the Roman Catholic Church. Plans, etc., at house of the above or at the office of the architect, R. A. Frechet, Moncton.

Barrie, Ont.

Tenders will be called about June 1st for erection of addition and alterations to cost about $40,000 to school here. Stewart & Witton, architects, Hamilton.

Brandon, Man.

This municipality will erect a town hall and fire hall combined. A large government building to be used as custom, land and post office will also be erected. J. Q. Brandon furnished the information.

Calgary, Alta.

City Engineer Child has submitted plans for a new 73 x 130 storehouse to cost about $50,000.

A special committee of the board of trade have pronounced on the inadequacy of the post office and customs office here.

Cranbrook, B.C.

Tenders addressed to J. D. McLean, assistant deputy and secretary, Department of Indian Affairs, Ottawa, will be received until May 29th for erection of industrial school at St. Eugene Mission, 5 miles from here. Plans, etc., at the office of the Inspectors of Indian Agencies at Victoria, Vancouver; at the offices of Dominion Lands at MacLeod, Calgary, and Lethbridge; and at the local post office.

Edmonton, Alta.

The Health Department will call for tenders for erection of Nurses' Home, $5,000.

Tenders are being called by tbe Edmonton Exhibition Association for erection of the new $100,000 stock pavillion on the Exhibition grounds.

Galt, Ont.

Tenders are called until May 13th for purchase of $25,000 worth of debentures for cost of additions, etc., to the hospital here. A. M. Edwards, chairman finance committee.

Quelph, Ont.

The plan of Architect Wm. Tanner, Jr., of this city, has been chosen by the Provincial Board of Health for the Infectious Hospital. Tenders will be called for erection of building to cost $15,000. Ald. McLean is interested.

Gretna, Man.

Tenders addressed to E. D. Tuttle, architect, 701 McArthur Building, Winnipeg, will be received until May 12th for erection of a brick school here.

Glace Bay, N.S.

The public school building at New Aberdeen was destroyed by fire on the 24th ulto. Estimated loss, $10,000.

Hamilton, Ont.

The Barton Street Baptist congregation, it is stated, have acquired the corner of Cannon street and Sherman.

Tenders addressed to W. R. Webb, 65 York street, president I.O.O.F., will be received until May 11th for erection of I.O.O.F. Temple. Plans, etc., at office of the architects, Stewart & Witton; A. Fraser, secretary-treasurer.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, will be received until May 15th for hot water boilers, setting, etc., for public building here. Plans, etc., on application to A. Barnard, caretaker, and at the above department.

Hull, Que.

The public school commissioners have decided to erect a large kindergarten school here this summer at the back of Notre Dame College.

Montreal, Que.

Mr. Geo. A. Ross has designed the new M. A. A. A. club house to be erected in Westmount.

Toronto, Ont.

Mr. Geo. A. Ross, architect, Montreal, has prepared plans for the $300,000 hockey arena to be erected on the site of the old Mutual Street Rink here. Among those interested are R. Reford, W. I. Gear, Montreal, and Sir H. M. Pellatt, Geo. A. Beardmore and Amelius Jarvis, Toronto.

Uxbridge, Ont.

Tenders addressed to R. C. Desrochers, Secretary, Department of Public Works, will be received until May 22, for erection of public building here. Plans, etc., at this department, and on application to Clerk of Works, station F., Yonge street, Toronto, Ont., and at the local post office.

Moose Jaw, Sask.

A by-law to carry out petition of ratepayers for a public library will be submitted shortly.

Tenders are called until May 22nd for construction of incinerator plant here. J. M. Wilson, city engineer; W. F. Heal, city clerk. Advertisement in "Tenders and For Sale Department" of this issue.

Montreal, Que.

The Protestant Board of School Commissioners will purchase a site for a new school in Outremont. Dr. Barclay, chairman.

The site for the new school for blind comprises 8¼ acres on Sherbrooke in Notre Dame de Grace. Plans are being prepared for the building, which will probably be in the form of cottage homes. Estimated cost of construction, $60,000. Hon.treasurer, P. E. Layton.

Nelson, B.C.

The building site for the new post office to be erected here at a cost of $75,000, has been cleared.

It is reported that tenders for the new $100,000 Court House to be erected here this summer are required to be in by May 23rd, and the contract awarded by June.

New Westminster, B.C.

The Isolation Hospital here was destroyed by fire on the 22nd ulto.

Ottawa, Ont.

Tenders addressed to Crawford Ross, secretary-treasurer, P. S. Board, will be received until May 16th for erection of addition to Mutchmor street school. Plans at office of W. B. Garvock, superintendent of buildings, Creighton street school.

Owen Sound, Ont.

The property on Eighth street west has been purchased as a building site for the new Carnegie Library. Miss V. Scott, librarian.

Renfrew, Ont.

Mr. J. D. McNichol, architect, has prepared plans for the proposed gymnasium in connection with the Collegiate Institute, to cost about $40,000.

South Vancouver, B.C.

Tenders will be called on May 8th for the addition of two wings to Cedar Cottage schools at an estimated cost of $40,000. Write Mr. Clement for further information.

Stratford, Ont.

Architect Thos. Hepburn has been authorized to prepare plans, etc., for a new arrangement of steam heating, ventilating, etc., to cost $2,300 for the Separate school.

St. John, N.B.

The Natural History Society building will be remodelled. W. McIntosh, curator

Strathcona, Alta.

The ratepayers will vote on May 10th on a by-law to authorize the borrowing of $50,000 to provide for erection of hospital.

Summerland, B.C.

A grant of 24 lots as a building site for the new hospital has been granted by the Summerland Development Company, provided the hospital cost not less than $10,000. A by-law will probably be submitted to the ratepayers. President Hospital Board, Mr. Robinson.

Toronto, Ont.

The Toronto Jewish Young Men's Association will raise $35,000 for erection of a club building.

The city's new registry office will be situated on the corner of University avenue and Anderson street.

The congregation of Ossington Avenue Baptist Church will enlarge their church at once. Pastor, Rev. M. C. McLean.

The Canadian Institute are contemplating the erection of a suitable building in the near future. President, J. B. Tyrell.

The congregation of St. Anne's are considering the erection of a parish house at a cost of about $40,000. Rector, Rev. L .E. Skey.

The Board of Control of Toronto have recommended to council an issue of $75,000 debentures for the establishment of public library branch at Bloor street and Dovercourt road.

The Ontario Government has purchased a new site for a residence for the Lieutenant-Governor on Douglas avenue and Roxborough East. The site comprises nearly 14 acres.

The Women's Christian Temperance Union have had plans prepared for a building to be used as a restaurant on the Exhibition grounds. Dr. Orr, chairman, Exhibition Committee.

The house and property of Mr. F. Nicholls, 13 Homewood Place, was purchased recently by Toronto physicians, whose purpose is to remodel and enlarge the building for a hospital, at a cost of about $125,000.

It is stated that tenders will be called shortly for construction of the new Stanley Barracks, near Long Branch, on the site secured by the Militia Department, Ottawa. Plans are about completed. Work is expected to start this summer and to continue for two or three years. More land has to be purchased. Sir F. Borden, Minister of Militia.

Tignish, P.E.I.

Tenders are called by Public Works Department, Ottawa, until May 17th for erection of public building here, R. C. Desrochers, secretary.

Winnipeg, Man.

The Granite Club will probably erect a new building to cost about $100,000 next winter. Tenders for sale of present quarters have been called.

Permits were granted to Dr. Thos. Beath for fireproof hospital on River avenue, $37,000; public bath, $45,000; Bruce & Bostorm, contractors; architect, Wm. Bruce.

Tenders addressed to F D. Tuttle, architect, 701 McArthur Buildin, will be received until May 5th for erection of brick school building. J. Turner, sec.-treas., S. D. No. 1,440.

Tenders will be called about the middle of June for erection of Isolation Hospital. The building will be fireproof and cost about $200,000. Equipment for heating, ventilation, laundry, bath and service fixtures will be required. H. B. Rugh, architect, 927 Union Bank Building.

[illegible] church and presbytery for St. Ignatius Parish were to be called about May 1st. Equipment costing about $50,000 will be required for basement. For further information address Jno. Chaffee, 476 McMillan avenue, Winnipeg. Noted in last issue.

AWARDED

Calgary, Alta.

The contract for construction of new city market was awarded to Boyle & Thomas, $38,400, which does not include the heating and plumbing of the original tender, of $41,000. Tenders will be called separately for these.

Outremont, Que.

The following contracts were awarded for construction of a fire and police station to be erected on St. Just avenue; masonry, Theo. Lessard ,$11,410; carpentry, Jackson Company, $7,675; roofing, Richardson Limard Company, $610; electric lighting, J. C. Duff, $125; plumbing, Tumblay & Frainocur, $1,346.

Regina, Sask.

The contract for erection of Methodist church here has been awarded to R. J. Lecky, $268,780.

Saskatoon, Sask.

The contract for erection of school on Alexandra street was awarded to Bigelow Bros., $49,300. Other tenders were as follows. Shannon Bros. & Cassidy, $56,000; Wright Construction Co., $53,352; T. E. Farley, $52,643; A. A. Godwin, $50,000. The contract was exclusive of heating and ventilation.

Vancouver, B.C.

The contract for erection of the two new fire halls on Fernwood and Cedar Hill roads was awarded to R. Lang at $5,175 and $5,150 respectively. Parfitt Bros. tendered at $5,703 and $5,745.

The contract for the new school at 12th avenue and Victoria street, Mount Pleasant, has been awarded to Messrs. Baynes & Horie, $58,740, the lowest. They will at once commence work of constructing the new building. The tenders for the Lord Nelson School were all found to be excessive; referred back to the architect for alterations.

Residences

Calgary, Alta.

Tenders addressed to F. J. Lawson, architect, Norman Block, will be received until May 6th for erection of one apartment house on Sixth avenue west. Plans, etc., at office of the above.

Montreal, Que.

The Mountain View Apartment House in the Annex was destroyed by fire on the 28th ulto. F. X. Clavette, owner. Estimated loss, $125,000.

Saskatoon, Sask.

St. James' congregation have decided to build a parsonage this year. Estimated cost, $3,000. Dean Tucker.

Winnipeg, Man.

A permit was granted to James Enright, Jarvis avenue, for apartment block, $36,500.

Permit has been issued to J. T. Bergman for apartment block, $72,700. P. C. Samwell, architect.

AWARDED

Brockville, Ont.

The following contracts for erection [illegible] awarded: Fox & Farr (masons), Brockville, [illegible]; Paisley & Horton (carpenters), Brockville, $2,000; Lindsay & [illegible] (painting), Brockville, $300; Geo. Ross (plumbing), $345; A. G. Dobbie (electric), Brockville, $168.50; Geo. Barclay (plaster), Brockville, $235. A. S. Allaster, architect.

Prince Albert, Sask.
A. F. Anderson has the contract for the building of Judge Forbes' new residence and Turner & Summers the contract for painting. A. G. Creighton, architect.

Ottawa, Ont.
The following contracts have been awarded in the construction of the stores and apartment house for Donald Fraser: George Crain, brick anad stone; W. Charlebois, carpentering; P. Ackroyd, electrical work; Murphy and Morrow, plasteing; J. R. McLennan, plumbing; and P. Stewart, painting. Horwood, Taylor & Horwood, architect.

Business Buildings and Industrial Plants

Amherst, N.S.
The plant of the Canadian Car Foundry Company was damaged by fire to the extent of about $200,000 on the 27th ulto.

Dauphin, Man.
The C. N. R. will shortly let the contract for a modern coal chute to replace the one recently burned. The government elevator commission will erect an elevator with a capacity for 30,000 bushels, at Ste. Rose du Lac.

Edmonton, Alta.
The by-law to grant a fixed assessment and free water to the G. T. P. for twenty years if they build an hotel here, carried.

J. F. Cairns, of this city, has just completed negotiations whereby he will erect a large new 4-storey store on the corner of Second avenue and Twenty-third street, 100 x 140 feet. Brown and Vallance, architects, Montreal, have the plans in hand and excavation work will start shortly. Total cost, $400,000.

Elora, Ont.
It is decided to place a by-law before the people to loan the Elora Furniture Company $10,000 to erect a two-storey addition to their present factory.

Fort William, Ont.
A new industry to produce cheap and efficient sewer pipe and paving block is reported here. Messrs. Dowler, Gowanlock, are interested.

Galt, Ont.
Hall & Utting will build a 2-storey addition, 60 x 40 feet, to their cabinet and planing mill, of reinforced concrete.

Huntsville, Ont.
G. F. Purdon contemplates the erection of a large addition to his hotel.

Lethbridge, Alta.
Tenders are invited for excavation and concrete basement for a proposed business building. Plans may be seen and particulars obtained from Alberta Loan and Investment Company, 416 Dufferin street, Calgary.

R. J. Hutchings, of the Great West Saddlery Company, announces that the company will build a factory and wholesale house in this city. The company has an option on a site. The new stock and plant will cost $250,000.

Moose Jaw, Sask.
The G. T. P. station, it is stated, will be situated not far from the C. P. R. station.

Beaubier Bros., of Brandon and Saskatoon, have purchased the corner of High street and Eighth avenue as a building site for the 5-storey hotel which they intend to erect at once.

North Vancouver, B.C.
McDougall-Jenkins Engineers, Limited, have purchased the plant, including foundry equipment, patterns, etc., of the Albion Iron Works. They will erect another shop extending from the present building a distance of 250 feet and costing about $150,000.

Ottawa, Ont.
F. W. Burns will erect a commercial building on the corner of Bronson and Somerset streets. W. E. Noffke, architect.

Hiram Robinson has decided to erect a four-storey building on Queen street instead of two storeys, first proposed. The building has about 100 feet frontage and will cost about $50,000. James Mather, architect; Holbrook and Sutherland, general contractors.

Peterborough, Ont.
Messrs. G. W. Green, W. C. Ackerman, Geo. Giyllespie, president, Board of Trade, and others, were appointed on the committee to report on the proposition of the Jules Motor Company regarding their location here.

Parry Sound, Ont.
The box factory of the Parry Sound Lumber Company was destroyed by fire on the 26th ulto.

Prince Albert, Sask.
A. G. Creighton, architect, is preparing plans for the 3-storey block to be built for Mayor Holmes. Estimated cost, $25,000. Contract for excavation has been let to Jas. Anderson.

Port Arthur, Ont.
Plans and specifications are being prepared for a 2-storey market building to be erected here. Estimated cost, $12,000. Material, cement. The suggestion has been made that a cold storage plant be included.

Specifications are being prepared for a large cement warehouse to be built on the C. P. R. track for the Riley-Ramsay Co., wholesale grocers. It is understood that work will be started early in the summer. As far as can be learned the estimated value for the building is not yet known, but it will be four or five storeys high, 80 feet wide, and about 150 feet deep.

Portage la Prairie, Man.
The National Grain Stooker Company, Limited, will erect their factory here. Plans, etc., will be called for at once and the factory built as soon as possible. Directors, I. Riley, M.P.P., Stonewall, and R. E. Bruce, LL.B., of Grandview. Mr. Boerman, local representative.

Regina, Sask.
The Alask Bedding Company are negotiating for rental of Wright Bros. warehouse pending the erection of their own. J. H. Parkhill, western manager; A. H. McIntosh, resident traveller.

Saskatoon, Sask.
A permit has been issued to the Ashdown Hardware Company, Winnipeg, for their 6-storey warehouse here, $150,000; also to the Dominion Bank for an office building on Second avenue, $35,000.

It is understood that a company to be known as the Saskatoon Cordage and Flax Fibre Company will locate here. Benjamin Ward, representative. Dr. Elliot is said to be interested.

Thetford Mines, Que.
Work on the excavation for the Bank of Montreal's new office building has been started.

Vancouver, B.C.
The ratepayers will vote on May 10th on the following by-laws: erection of isolation hospital and clearing site, $30,000; construction of jail on Admiralty reserve and purchasing sub-station in city, $30,000.

Woodstock, Ont.
The cheese factory of J. H. Williams was destroyed by fire on the 27th ulto. Loss, about $4,000.

Westport, Ont.
The Westport Manufacturing and Plating Company's plant was destroyed by fire recently.

Windsor, Ont.
The Foresters' Block was damaged to the extent of about $17,000 on the 25th ulto.

Winnipeg, Man.
Tenders addressed to D. W. McCuaig, chairman, Government Elevator Commission, 579 Garry street, will be received until May 6th for remodelling the government elevators at the following points, Minitonas, Dauphin, Grandview, Miami, Oakville, St. Claude, Swan Lake, Valley River, Miniota.

Yorkton, Sask.
The manager of the Hudson Bay Co. announces the probable construction of a large department store here. Commissioner Burbidge.

AWARDED

Calgary, Alta.
The contract for the erection of the new C. P. R. Land and Irrigation building was awarded to McDiarmid Bros., of Winnipeg. The contract calls for the termination of the building by October 1st next.

Galt, Ont.
The Down Draft Furnace Company has awarded the contract for an addition to the nickel-plating department to Thomas & Hancock.

Ottawa, Ont.
The following contracts have been awarded in the Blackburn building: McFarlane and Douglas, ventilation and copper work; M. M. O'Connell, heating and plumbing; W. J. Carson, painting and glazing; Talkins Tile and Mosaic Company, Montreal, marble and tile work. W. E. Noffke, architect.

Prince Albert, Sask.
The contracts for the Manville-Angus block were awarded to Bonas Bros, masonry; T. E. Baker, carpentry; Manville

Hardware Co., tinsmithing, heating and plumbing; Turner & Summers, painting, and W. Davy, the electric lighting. The lowest tender was accepted in each case. Total cost, $50,000. Work will be started as soon as possible.

Regina, Sask.

The contract for erection of the wholesale warehouse for the Great West Saddlery Company has been given to Wilson & Wilson, of Regina. Dimensions, 75 x 50, full sized basement.

St. John, N.B.

The contract for the mason work in connection with the enlargement of building for T. McAvity & Sons has been given to A. R. C. Clark; carpentry, Edward Bates.

Toronto, Ont.

The contract for erection of C.P.R. freight shed 300 x 30 x 40 here, has been awarded to Geo. Martin, Smith's Falls.

A. B. Ormsby, Limited, has been given the following contracts: steel shutters and fireproof doors for the Mason & Risch Building, Yonge street; galvanized iron, roofing and windows on Lionel Rawlinson's warehouse; galvanized iron, copper and felt roofing work on Home Bank, Broadview and Elliott street.

Vancouver, B.C.

The contract for construction of fireproof freight sheds, 250 feet long, for the C. P. R., has been awarded to R. G. Wilson & Co.

Marriott & Fellows have been awarded the contract for erection of the new fireproof building for the Arts and Crafts. Estimated cost of building, $70,000.

Victoria, B.C.

Mr. J. L. Skene, contractor, has been awarded the contract for the erection of the new British Columbia Telephone block. It is expected that the new premises will be ready by the first of September. The building will be of concrete construction and fireproof, costing about $60,000.

Welland, Ont.

The Welland Machine & Foundries, Limited, have been awarded the contract to supply 150 tons of gray iron castings for the construction of the Page-Hersey works.

The Bishop Construction Company, Limited, Toronto and Montreal, have been awarded the contract for extensive addition to the plant of the Canadian Billings & Spencer Company, Limited, here.

Winnipeg, Man.

The cantract for the new warehouse of the Ontario Wind, Engine & Pump Company has been let to Alex. Jamieson, Winnipeg. Amount of permit, $50,000. G. M. Miller & Co., Toronto, architects.

The contract for completion of coach shops and buildings for the National Transcontinental Railway, estimated to cost about $2,500,000, has been awarded, it is stated, to Haney, Quinlan & Robertson. Completion within two years.

Power Plants, Electricity and Telephones

Chatham, Ont.

The Chatham, Wallaceburg & Lake Erie Railway may extend the road to Blenheim and Sarnia this summer.

Edmonton, Alta.

On May 16, the ratepayers will vote on the agreement between the International Heating and Lighting Company, of Cleveland, Ohio, and the city, for a non-exclusive twenty-five year franchise for the manufacture and distribution of gas.

Superintendent Ormsby, Electric Light Department, has submitted a plan of lighting similar to those in use in eastern cities. All of the wiring in connection with the installation of cluster Tungsten lamps will be underground. He also proposed to install a new system of arc lights, each being of 1,300 candle power, as well as fifty additional arc lamps of the type now in use. The entire scheme would call for the installation of approximately 125 new arc lights as well as eight-five ornamental iron poles, which the superintendent will recommend the city to purchase will cost approximately $85 each, while the total cost of the venture will be in the vicinity of $10,000.

Fort William, Ont.

Tenders addressed to the Chairman of the Utilities Committee, care of City Clerk, will be received until May 4th for the following: 50 tons 60 lb. T rail, A.S.C.E. section, drilling 2½-in. x 5-in.; 90 pair angle bars for 60 lb. T rail, A.S.C.E.; 50 kegs railroad spikes 5½ in. x 9-16 in.; 3,000 lock-nut washers for ¾-in. bolts; 400 track bolts and nuts, 4 in. x ¾-in. A. L. Farquharson, construction superintendent.

Guelph, Ont.

Tenders are called until May 11th for construction of about 4,900 feet of street railway track. J. J. Hackney, manager, Guelph Radial Railway. Advertisement in "Tenders and For Sale Department" of this issue.

Hamilton, Ont.

A Toronto syndicate, represented by Engineer Somerville, is preparing to make a proposition to the city to build an electric line to Galt, Hespeler and other western towns. Inquiries have been made as to what powers the city has to compel the Cataract Railways to give other railways running rights over their lines into the city.

Knowlton, Que.

A committee was appointed to report on the cost of installing a municipal power plant.

London, Ont.

The London Street Railway Company will put on night shifts to hurry the construction work on Richmond and Dundas streets.

Melville, Sask.

The by-law for electric light, $23,000, was carried.

Moose Jaw, Sask.

Tenders are called until May 9th for construction of a rural telephone line; tenders for labor and material to be made separately. Information, etc., on application to Geo. Wilcox, sec.-treas., Moose Jaw-Enterprise Rural Telephone Co., 92½ Manitoba street east.

Niagara Falls, Ont.

Recommendations for the purchase of the necessary transformers for the new Bell Telephone plant were submitted to council.

Prince Rupert, B.C.

A proposition to supply Prince Rupert with gas for lighting and cooking purposes, electric power for industries and street cars was outlined to the city council recently by Raymond Brutinell, representing the Tsimpsean Light and Power Company. The company proposes to spend $3,000,000 on the enterprise and briefly the proposition is to supply gas at$1.25 to $1.75 per thousand feet; electric power up to 50,000 horse power at $30 per h.p. year, with a reduction after 5,000 horse power is taken; to build a line for street cars and run them when the city has 15,000 people. Under the agreement the gas plant will be installed here, and electric power will be transmitted from a point forty-two miles up the Skeena river and the company will give the city from 3 to 10 per cent. of the gross earnings of the street cars.

Renfrew, Ont.

This municipality will spend about $117,000 in the construction of the power plant inclusive of site; work probably will be done by day labor. Engineer in charge, J. R. Stewart, Renfrew. W. E. Smallfield, chairman, waterworks committee.

Scott, Sask.

A by-law to expend $9,000 on electric light system will be voted upon on May 8th.

Sandwich, Ont.

A franchise has been granted R. Stuart to run a line of poles and wires across town to carry electric power developed from a plant to be constructed in Sandwich.

St. John, N.B.

A meeting of the Eel River Light, Heat & Power Company, Limited, was held recently. John G. Murchie was elected president; H. A. Connell, vice-president and general manager, and R. G. Lee, secretary-treasurer. The directors authorized Mr. Connell to proceed with the work of survey immediately. The plant is expected to be in operation before the close of the year.

Toronto, Ont.

Tenders addressed to G. R. Geary, Chairman, Board of Control, will be received until May 9th for supply of glass cylinders and aluminum reflectors. Specifications obtained from Toronto Hydro-Electric System, City Hall.

Tenders addressed to G. R. Geary, Chairman, Board of Control, will be received until May 23rd for supply of steel crossing towers. Specifications obtained from the Toronto Hydro-Electric System, City Hall, Toronto. Advertisement in "Tenders and For Sale Department of this issue.

Victoria, B.C.

See "Business Buildings Awarded."

Welland, Ont.

The Niagara Falls, Welland & Lake Erie Railway Company, Hendrick H. Leach & Co., contractors for the construction of the street railway system in this town, have commenced work. The Ontario Power Company will furnish the power.

AWARDED

Magog, Que.

The contract for construction of hydro-electric plant here, has been awarded to the Bishop Construction Co., Ltd., of Montreal. T. Pringle & Son, consulting engineers, Montreal.

(Continued on page 60)

Tenders and For Sale Department

Tenders for Steel Bridge

Tenders will be received by the undersigned up to 4 p.m., on Tuesday, May **16th, 1911**, for the erection of a Warren Truss Steel Bridge, over Snake Creek at Dunblane, 5 miles north of Paisley. Span 60 ft., centre to centre of bearings, 14 ft. roadway, concrete floor.

Plans and specifications may be seen at my office, Walkerton. Tenders will be opened on Wednesday, May 17th, at 2 p.m., at Queen's Hotel, Port Elgin.
Also tenders received for the erection of two concrete abutments for said bridge.

The lowest or any tender not necessarily accepted.

JAMES WARREN,
Engineer.

Walkerton, April 22, 1911. 17-18

Department of Railways and Canals

Ontario—St. Lawrence Canals

Rapide Flat Canal

Sealed tenders addressed to the undersigned and endorsed "Tender for Improving Lower Extreme to Lock No. 24," will be received at this office until 16 o'clock on **Friday, May 5th.**

Plans, Specifications, and Form of Contract to be entered into can be seen on and after Monday, April 17, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Resident Engineer of the Ontario—St. Lawrence canals, Cornwall, at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wage schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $9,000 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES, Secretary.

Department of Railways and Canals,
Ottawa, April 14th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 17-18

Bucket Crane

FOR SALE—One full circle, self-propelling, modern 10 to 15-ton capacity Browning size No. 1 Locomotive Crane, standard gauge, 4-wheel truck, 38 ft. steel boom, 8 x 10 engines, equipped to handle Clam or Orange Peel. Will furnish with or without bucket. Attractive price, fine condition, quick delivery. Inspection here.

WILLIS SHAW MACHINERY CO.
39 So. LaSalle Street, Chicago.

PORT HOPE

Tenders

For Concrete Sidewalks, etc.

The Corporation of Port Hope invite Tenders for the construction of five lineal miles, or thereabouts, of Concrete Sidewalks and Crossings, with the necessary works connected therewith, in accordance with detail and specifications prepared therefore, copies of which, with forms of tender, may be obtained on application to the undersigned. A marked cheque equal to five per cent. of the gross amount of the contract to be furnished with each tender, and the lowest tender not necessarily accepted. Tenders will be received to noon, **15th May, 1911.**

J. W. SANDERS,
Town Clerk.

Dated 19th April, 1911. 17-19

Tenders

For Steel Crossing Towers

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon of Tuesday, **May 23, 1911**, for steel crossing towers.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications may be seen and forms of tender obtained from the Toronto Hydro-Electric System, City Hall, Toronto.

Tenderers shall submit with their tender the names of two personal sureties (approved by the City Treasurer) not members of the City Council or officers of the Corporation of the City of Toronto, or, in lieu of said sureties, the bond of a guarantee company approved as aforesaid.

The lowest or any tender not necessarily prescribed by city by-law must be strictly complied with or the tenders will not be entertained.

The lowest or any thender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman, Board of Control.

City Hall, Toronto,
April 26, 1911. 3-3

CITY OF MOOSE JAW
Saskatchewan

Incinerator Plant

Sealed proposals endorsed "Incinerator Plant" will be received by the City of Moose Jaw addressed to the undersigned City Clerk until 8.30 o'clock p.m., on **Monday, 22nd May, 1911.**

The proposals received may cover alternative designs and methods but in any case the plant shall be capable of handling 25 tons per day.

The price bid shall include the supply of all materials for and the complete construction of the plant, same to be turned over to the Corporation in satisfactory working order.

Satisfactory guarantees shall accompany each tender.

The lowest or any thender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.

Moose Jaw, April 24th, 1911. 18-20.

Department of Railways and Canals

Ontario—St. Lawrence Canals

CORNWALL CANAL

Sealed tenders addressed to the undersigned and endorsed "Tender for Dredging Rapide Plat Canal," will be received at this office until 16 o'clock on **Friday, May 5th.**

Plans, Specifications, and Form of Contract to be entered into can be seen on and after Monday, April 17, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Resident Engineer of the Ontario—St. Lawrence canals, Cornwall, at which place form of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $750 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES, Secretary.

Department of Railways and Canals,
Ottawa, April 14th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 17-18

TENDERS WANTED

Sealed tenders will be received until **Monday, May 8th**, noon, by J. W. Sanders, Town Clerk, Port Hope, for the construction of reinforced concrete girder bridge, superstructure 130 feet long on present piers, and for filling approaches.

Plans and specifications may be seen at the Clerk's office, or at the office of the Engineers.

BOWMAN & CONNOR,
17-18 36 Toronto St., Toronto, Ont.

PIPE LAYING

Tenders will be received until **May 25th next** for excavation and pipe laying for Harriston Waterworks. For all information apply to the Engineers,

BOWMAN & CONNOR,
18-18 Berlin, Ont.

CITY OF TORONTO

Tenders

For Construction of Ashbridge Bay Docks

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on **Tuesday, 23rd May, 1911**, for the construction of dock in Ashbridge Bay.

Envelopes containing tender must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained upon application to the Department of Railways, Bridges and Docks, City Engineer's Office, Toronto.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman, Board of Control.
City Hall, Toronto,
April 12th, 1911. 17-19

City of Prince Albert, Sask.

Tenders for

Electrical Machinery

Sealed tenders addressed to the City Commissioners, and marked "Tenders for Electrical Machinery," will be received until Wednesday, May 31st, 1911, for the following,

A.—One 100 h.p. Cross Compound Engine with necessary condensing apparatus, steam piping, installed complete.

Tenders on Engine of the following classes will be considered:

(1) Horizontal Cross Compound Corliss Engine, 125-150 r.p.m.

(2) Vertical Cross Compound Corliss Engine. 125-150 r.p.m.

(3) Vertical Cross Compound Quick Revolution Engine, Forced Lubrication.

B.—600 k.w. 2,200 volt, 60 cycles, 3-phase Engine Type Alternator, Exciter, Switchboards, Automatic Regulator, installed complete.

C.—72 in. x 18 ft. Return Tubular Boiler, suitable for 150 lbs. working steam pressure.

Specifications will be furnished on application to the City Commissioners, or R. Wright, City Electrician.

The lowest or any tender not necessarily accepted.

[illegible]
C. C. DAVIDSON, City Commissioners.
D. A. CRE[illegible]TON, 17-18

CITY OF GUELPH

Sealed tenders will be received by the undersigned up till noon on **Thursday, May 11th, 1911**, for the construction of approximately 4,900 feet of street railway track.

Plans and specifications may be seen at my office, or at the office of the City Engineer.

Each tender must be accompanied by a marked cheque for ten per cent. of the amount of the bid.

The lowest or any thender not necessarily accepted.

J. J. HACKNEY,
Manager Guelph Radial Railway.
Guelph, April 25th, 1911. 18-18

Tenders for

Bridge and Abutments

Tenders will be received by the undersigned up to noon, **May 27th, 1911**, at Arkwright P.O., for the erection of two concrete abutments, and one span Baltimore truss of 100 ft. span, over the Sauble River, about two miles from Tara.

Abutments to be completed by the 15th of July, and the superstructure to be completed by the 15th of August, 1911. An accepted cheque for $100, payable to the Treasurer, Township of Arran, must accompany each tender. Tenders to be opened at Arkwright at 2 p.m., May 27th, 1911.

The lowest or any thender not necessarily accepted.

(Signed) JOHN H. WILES,
Reeve Arran.
Arran, May 1s,t 1911. 18-19

Tenders

FOR MAIN SEWERAGE

Municipality of North Toronto

Tenders are invited for providing and laying Main Sanitary Pipe Sewers. Construction of Manholes, etc., as follows:

Contract No. 1.

Includes approximately Sewers to Streets and Trunk Sewers south of and including Eglinton avenue.

Contract No. 2

Includes approximately Sewers to Streets and Trunk Sewers north of Eglinton avenue and south of and including Glenview avenue to the west of Yonge street and south of and including Victoria avenue to the east of Yonge street.

Contract No. 3

Includes approximately Sewers to Streets and Trunk Sewers north of Glenview avenue to the west of Yonge street and Victoria avenue to the east of Yonge street to the Town Limits north.

Plans may be seen and information obtained at the offices of T. Aird Murray, 303 Lumsden Building, Toronto, on or after the 3rd of May, 1911.

Copies of the Conditions of Contract, together with Key Plans, Bills of Quantities, Schedule and Forms of Tender may be obtained [illegible] $25, returnable on receipt of bona fide Tender together with all documents and plans supplied.

Tenders to be sent in under seal not later than **Monday, the 15th of May, 6 o'clock p.m.** [illegible] to the value of 2½ per cent. of the amount of tender, such cheque to be returned when tender or tenders is or are accepted or rejected.

[illegible] accept the lowest or any tender.

A. J. BROWN, Mayor,
T. Aird Murray, North Toronto, Ont.
Consulting Engineer. 18-18

City of Kingston

NOTICE TO PAVING CONTRACTORS

Sealed tenders under registered post only, addressed to the undersigned will be received by the Board of Works up till 12 o'clock noon, Saturday, May 20th, 1911, for the construction of:

6,100 square yards of Pavement;

2,276 lineal feet of Curb and Gutter.

Plans and specifications may be seen and all other information obtained at the office of the undersigned.

Plans and specifications are also on file at the offices of the Contract Record, 220 King street west, Toronto, and B-34 Board of Trade, Montreal.

The lowest or any tender not necessarily accepted.

H. B. R. CRAIG,
City Engineer.
April 29th, 1911. 18-18

For Sale or Exchange

Municipal Pumping Plant Deseronto, Ontario

Tenders will be received by the undersigned up to noon of **June 4th, 1911**, by the Corporation of the Town of Deseronto, for the sale of the following equipment:

One 75 h.p. Fairbanks-Morse Suction Gas Producer.

One 65 h.p. Fairbanks-Morse Vertical Producer Gas Engine.

One 12 x 15 Triplex Pump, direct connected by friction clutch to Gas Engine, capacity 1,000 gallons per minute.

The above equipment has only been operated a short time and is in first-class condition. Changing to hydro-electric power necessitates disposing of above equipment. Plant is offered complete as above or separately, or would consider an exchange for equal capacity rotary pump **and motor.**

Specifications and dsecription of above equipment furnished on application to the undersigned or can be seen at the office of the Contract Record, B34 Board of Trade Building, Montreal; or at the office of the Canadian Engineer, 62 Church street, Toronto, or 404 Builders' Exchange, Winnipeg.

LUCIUS E. ALLEN,
Consulting Engineer,
18-20 Belleville, Ont.

EXTENSION OF TIME

City of Edmonton, Alberta

Sealed tenders marked "Tenders for Trunk Sewer," will be received by the City Commissioners up till 3 p.m., **May 15th, 1911**, for the supplying of all materials and the constuction, in tunnel of a concrete sewer ten feet six inches (10 ft. 6 in.), in internal diameter and approximately 3,290 feet long.

Plans and specifications and all particulars may be obtained from the City Engineer's office, Ed[illegible] sum of $25.00, which will be held until the return of plans and specifications. Duplicates of which may be seen at the office of the Con[illegible]

[illegible]

CITY COMMISSIONERS

[illegible]
City Engineer,
[illegible]

[illegible] 1911

TENDERS WANTED

[illegible] Excavation, Concrete Foundation, Brick Work, [illegible] Work, for a two-storey and [illegible] Road and [illegible] Street, Toronto. Plans at King Construction Company, 248 Wellington Street West, Toronto.

TENDERS FOR CLUB BUILDING

Bulk tenders, or tenders for the several trades required, will be received by the undersigned, up to **May 15th next (1911)**, at 6 o'clock p.m., for the erection of a club building, for the Galt Club, Limited, on Dickson Street, Galt, Ontario, according to plans and specifications which may be seen at the office of the Secretary, Gore Building, Galt, or Stewart and Witton, architects, Hamilton.

The Club do not bind themselves to accept the lowest or any tender.

M. A. SECORD, Secretary,
18-19 The Galt Club, Limited.

CITY OF MOOSE JAW
Saskatchewan

Storm Sewer Extensions

Sealed tenders endorsed "Contract 32 or 33" will be received by the City of Moose Jaw addressed to the undersigned City Clerk until 8.30 p.m. on **Monday, May 22nd, 1911.**

Any tender received after the above stated time will be declared informal.

Contract 32.—The laying of approximately 9,000 lineal feet of Storm Sewer and 2,300 lineal feet of Catch basin connections and builidng manholes, catch basins, etc.

Plans and specifications may be seen at the City Engineer's office.

Contract 33.—The supply of approximately: 7,900 lineal feet of 10-in. Vitrified Tile Pipe; 1,100 lineal feet of 8-in. Vitrified Tile Pipe; 2,300 lineal feet of 6-in. Vitrified Tile Pipe, also junctions, bends, etc.

Specifications may be obtained from the City Engineer's Office upon application.

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.
Moose Jaw, April 29th, 1911.

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

POSITION WANTED—As Clerk of Works in a good sized job. Six years experience with full charge of details and awarding of contracts. Thoroughly understand plans, specifications and details. First-class references. At liberty at once. Apply Box 267, Contract Record, Toronto, Ont. 18-18

Miscellaneous

Advertisements under this heading two cents per word per insertion.

Large European concern manufacturing water turbines, centrifugal pumps and steam turbines, wants to be represented in Winnipeg and Vancouver by well-known qualified and experienced firm. Box 265, Contract Record, Toronto, Ont.

Carpenters in Demand

Weyburn, Ssak.

Carpenters are in great demand here. Contractors are paying 50c. an hour. There is room for a first-class building contractor with capital.

Power Plants, Electricity and Telephones

(Continued from page 57)

Ottawa, Ont.

The contract for supply of 150 more poles for the lights on Bank, Dalhousie and Queen streets, was awarded to the Canada Foundry Company, Toronto, $44.60 per pole; the lowest. No. local firms tendered. Sparks street poles cost about $47.

Winnipeg, Man.

The board recommended that the tender of the Canadian Fairbanks Company for a motor car to be used on the city's railway line from the C. P. R. switch to Point du Bois, be accepted. The price of the motor car, which will be used for both passengers and freight, is $11,169.

Miscellaneous

Dunnville, Ont.

Tenders are called until May 8th for construction of sewer connections. A. M. Jackson, Town Engineer, J. W. Holmes, Town Clerk.

Galt, Ont.

Tenders are called until May 15th for erection of a club building for the Galt Club, Limited. Stewart & Witton, architects, Hamilton; M. A. Secord, secretary, Galt. Advertisement in "Tenders and For Sale Department" of this issue.

Harriston, Ont.

Tenders are called until May 25th for excavation and pipe laying for waterworks here. Bowman & Connor, engineers, Berlin. Advertisement in "Tenders and For Sale Department" of this issue.

Kingston, Ont.

Tenders are called until May 20th for pavement, curb and gutter. H. B. R. Craig, city engineer. Advertisement in "Tenders and For Sale Department" of this issue.

Kippewa, Que.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, will be received until May 29th for construction of dam and sluiceway here. Plans, etc., with above department and with J. E. Sing, district engineer, Toronto, and on application to postmaster at Haileybury, Ont.

Ottawa, Ont.

Tenders addressed to R. C. Desrochers, Secretary, Public Works Department, will be received until May 15th for dredging required at Prince Edward Island—Summerside and Vernon River; Nova Scotia—Cheticamp, Digby, L'Archeveque, Larry's River, Margaro Harbor, St. Mary's River, West Bay; New Brunswick — Buctouche Beach, Cape Tormentine, Loggieville, Marquapit Lake, Ox Island, Raft Channel, Richibucto, Scotchtown, Shediac, Shippigan Gully, St. George, St. Stephen.

Toronto, Ont.

Recent building permits include:—Woodcock & Lock, 1 pr. semi-det. 2-storey brick dwellings, Follis, $5,000; H. & J. R. Gray, 2 det. 2-storey brick dwellings, 6-8 Runnymede avenue, $7,000; Bank of Ottawa, 2-storey brick office building, cor. Gerrard and Broadview, $20,000; J. T. & H. Hutson, 2-storey brick apartments, cor. Avenue road and Cumberland street, $80,000; N. Butler, 3-sty. brick apartments, Howard, $20,000; Badali Bros., 2-storey brick store and dwelling,, cor. Queen and Logan avenue, $5,000; John Pherrill, 2 det. 2-storey brick dwelling, Edgwood Crescent, $7,000; D. E. Kennedy, 2½-storey brick dwelling, 118 Warren road, $8,500; P. K. McKissock, 2-storey brick apartments, 807 Bloor street west, $12,000; J. H. Simpson, 2-storey brick addition to dwelling, 345 Gladstone avenue, $6,000; S. J. Sharp & Co., 2 pr. semi-det. 2-storey brick dwellings, Palmerston Gardens, $7,200; W. S. Meredith, 2-storey brick warehouse, Duchess street, $25,000; Standard Sanitary Mfg. Co., alterations to foundry, Royce and Lansdowne, $13,000; M. Spence, 1 pr. semi-det. 2-storey and attic brcik dwellings, Strathcona avenue, $5,000; W. E. Booth, 2½-storey brick dwelling, St. Clair and Vaughn, $8,000; A. McColl, 2-storey brick factory, Dufferin street, $5,000; H. B. Reesor, 2-storey brick apartments, Linden street, $8,000; Joyce & Snow, 1 pr. semi-det. 2-storey brick dwellings, Armstrong avenue, $5,000; S. Prest, 3 att. 2-storey brick dwellings, Davenport Road, $6,000; W. I. B. Wellwood, 2-storey brick dwelling, Fredrica street, $5,000.

New Companies

Contractors, Limited, Montreal, Que., incorporated, capital $100,000. Incorporators, Joseph Wilfrid Simard, Civil Engineer; Henri Gerin-Lajoie, K.C., and Paul Lacoste, advocate, all of Montreal, Que.

The Grand Metis Power Co., Ltd., Montreal, Que., incorporated, capital, $100,000. Incorporators, Wm. James Shaughnessy, advocate, and Alvin Ernest Woodworth, accountant, both of Montreal, Que.

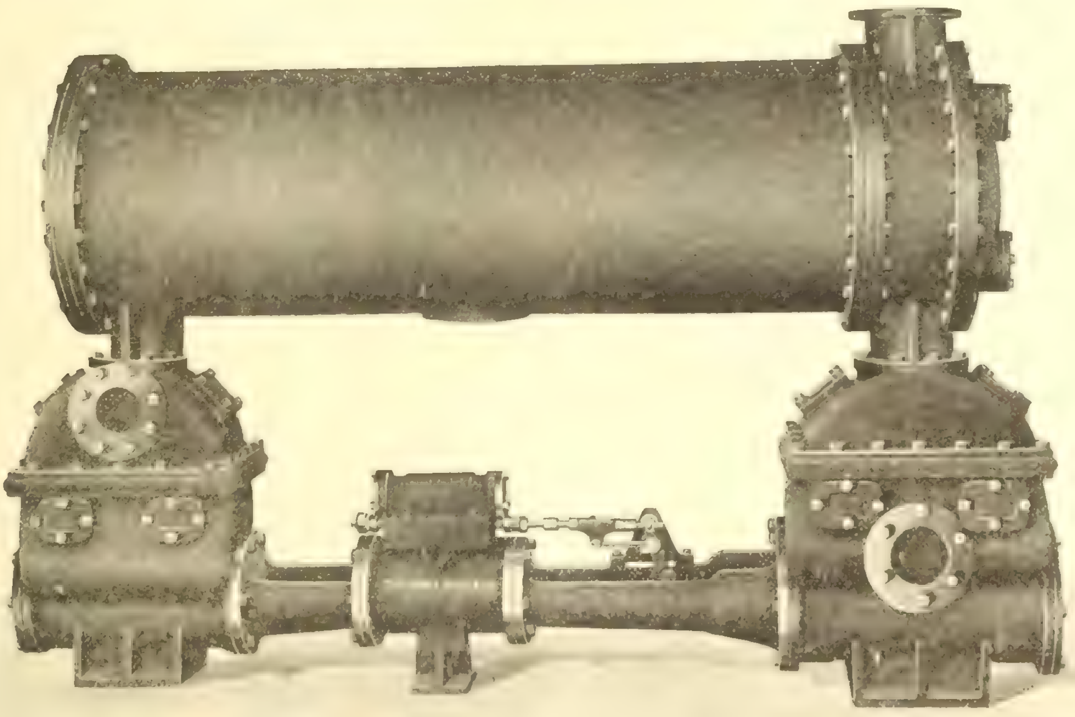
Canadian Yale and Towne, Limited, St. Catharines, Ont., capital, $100,000, incorporated to manufacture safes, locks, hinges and locks of all kinds. Incorporators, Henry Robinson Towne and John Henry Towne, both of New York City, N.Y.; Walter Cleveland Allen, Stamford, Conn.; John Bell Miliken, Montclair, N.J., manufacturers, and Louis Hopkins Porther, Stamford, Conn., counsellor at law.

The United Engineering & Construction Co., Ltd., Toronto, Ont., capital, $100,000. Incorporators, Frederick Philip Metzler, insurance manager; William John Taylor, accountant; Geoffrey Barron Taylor, C.E.; John Manly Spinks, and Edward Gillis, solicitor, all of Toronto, Ont.

The Masco Co., Ltd., Toronto, Ont., capital, $100,000, incorporated to carry on the business of electricians, electrical supplies, etc. Incorporators, Edward Gordon McMillan, law student, John Fraser McGregor, William Hamilton Walter, accountants; Harry Riley, law clerk; Alfred Bicknell, solicitor, all of Toronto.

The Holophane Co .,Ltd., Toronto, Ont., incorporated to carry on the business of electrical gas, etc., capital, $50,000. Incorporators, James Stellar Lovell, accountant, and William Bain, bookkeeper, both of Toronto.

Condensors



Condensor built by The John Inglis Co., Limited

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

Let us Submit Prices.

The John Inglis Company Limited

Engineers and Boilermakers

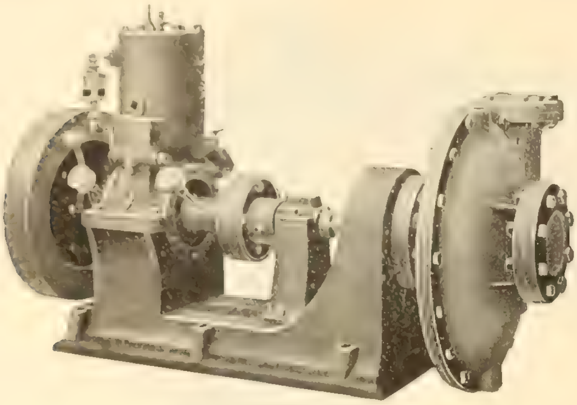
14 Strachan Ave., TORONTO, Canada

(Continued from page 51)

finger ring level sells for $1, for which sum it can be obtained upon application to the Kokomo Level Company.

An Up-to-Date Centrifugal Pump

The accompanying illustration shows a side suction centrifugal pump, driven by a gasoline engine, as built by the Smart-Turner Machine Company, Limited, Hamilton, Ont. These pumps are built with one, two and three cylinder engines, the engine being of the two-cycle marine pattern, the speed of which may be adjusted by the carburetor and commutator, so that the pumps are good for services up to 40 head. They are particularly useful on contracting work where it is not convenient to use a steam pump. They are easy to start and operate, and require little care. The company will be glad to give any desired information.



Smart-Turner Centrifugal Pump

Canada Iron Corporation, Limited

The Canada Iron Corporation, Limited, Montreal, has secured contracts for the following municipal supplies:

At Edmundston, N.B., the entire pressure water pipe for new waterworks plant, amounting to 600 tons, equal to about five miles of iron piping.

At Stellarton, N.B., a considerable amount of iron pipe pipe for the extension of the water system.

At Hebertville, Lake St. John District, Que., a quantity of material sufficient to lay about six miles of iron pipe for a new waterworks system being constructed under the direction of Mr. V. H. Dupont, Engineer, of Montreal.

At Ottawa, the total requirements of the city for pressure pipe for the year 1911. This will probably amount to 1,000 or 1,500 tons of all sizes.

At Fort William, 1,000 tons of pipe for municipal purposes.

At Winnipeg, from 800 to 900 tons.

At Prince Albert, Sask., the entire requirements for 1911, estimated at from 800 to 1,000 tons, equivalent to about eight miles of pipe. This is for the new waterworks system. This town is growing so fast that it is not known how far the waterworks system will have to be extended to meet the requirements of the population.

At Edmonton, Alta., the entire year's requirements, estimated at between 1,200 and 1,500 tons.

Messrs. Manders Bros., of Edmonton, who have been awarded the contract for a sewage disposal plant at Moose Jaw have ordered from the Canada Iron Corporation, Limited, some three hundred tons of pressure pipe for an extension of about two miles of conduit.

WATER - POWER PLANTS
LOW PRESSURE TURBINES

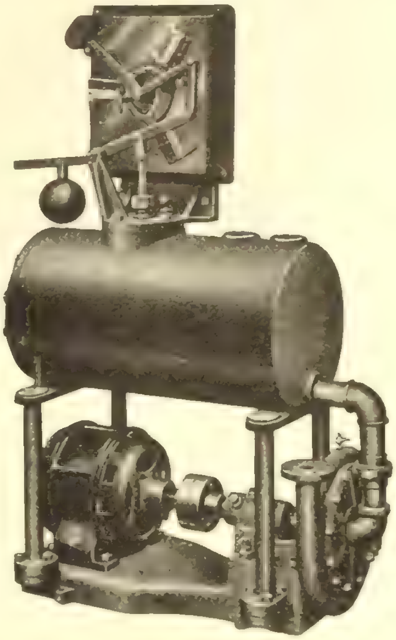
ANY OUTPUT

ESCHER WYSS & CO.

Water Power Engineers
Works: Zurich, Switzerland

Canadian Office: Toronto: Lumsden Bldg., R. 408

Cablegrams: Neumuehle, Toronto
Phone Adelaide 234, Toronto



CENTRIFUGAL PUMPS

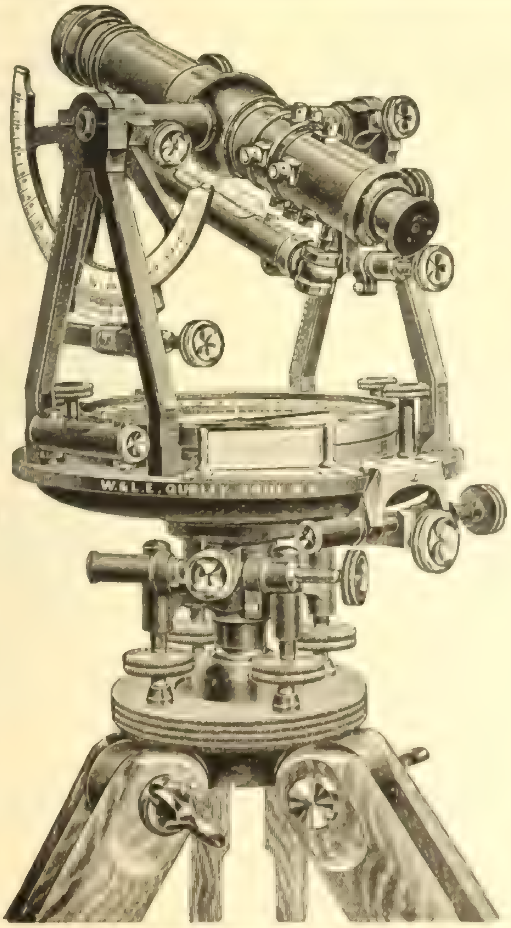
Built from the designs of our consulting engineer, Mr. W. C. Brown, formerly chief engineer for Henry R. Worthington, New York.

The illustration shows a simple and effective means of draining steam cylinders, heating systems, steam coils, etc., automatically.

Works:
512 William Street, Montreal

Sales Offices:
Montreal, Toronto, Cobalt, Winnipeg, Calgary, Vancouver.

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.
LIMITED



1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

- Transits
- Y Levels
- Compasses
- Plane Tables
- Current Meters
- Levelling Rods
- Chains
- Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

For efficient and economical

Weather and Waterproofing

use

Kiton

The Coal Tar which is soluble in water (but once only)!

It can be applied everywhere, to anything, even to

Wet and Cold Walls

No Tar Kettle! **No Fire!** **No Waste!**

For information write to

F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.

Enameled Brick

FOR EXTERIOR AND INTERIOR DECORATING AND CONSTRUCTION

Used in all modern buildings where the maximum amount of light and sanitary conditions are essential

Summary of Classified List of Jobs

No.	JOBS	1st. Quality	2nd Quality
104	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,991	412,545
50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and Fire Houses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

Send for Catalogues and Color Sheets

American Enameled Brick & Tile Co.
1182 Broadway, NEW YORK CITY
Local Agents in Montreal, Toronto and Ottawa.

CONTRACTORS

Home of W. J. Sykes, Ottawa, Can. Architect, Boyd Brothers. Frontage, 34 feet, depth, 32 feet Eleven rooms, hot-water heat. Cost complete, $6,000. Ideal blocks used.

You Mr. Contractor, want to know of course if "IDEAL" Face Down Concrete Machines are giving satisfaction.

Take the City of Windsor, for instance. The first "IDEAL" Machine was sold there late in 1909.

Last year we sold THIRTEEN more—and this year, we expect to place additional Machines.

The reliability, durability and economy of "IDEAL" Machines has been proven by 10 years of honest service.

If you have a contract in view, where concrete blocks could be used in place of stone or brick, write us for full information and prices of the "IDEAL" Machines.

IDEAL CONCRETE MACHINERY CO., LIMITED
Dept. C.R., - London, Ont.

THE CEMENT ERA—A monthly trade journal of merit. Devoted to the concrete and cement industry. Is carefully edited in the interest of the trade. Covers the following subjects: Reinforced Concrete Building, Cement Block Manufacturing, Tile Making, Concrete Paving, Ornamental Cement Work, Waterproofing, Fireproofing, etc. $1.50 a year. Send for sample.

CEMENT PIPE AND TILE—By E. S. Hanson. A cloth bound book which fully treats the subject of manufacturing cement pipe and tile, its uses, cost of production, etc. Its author is recognized as the leading authority on this subject. Price $1.00 a copy, delivered.

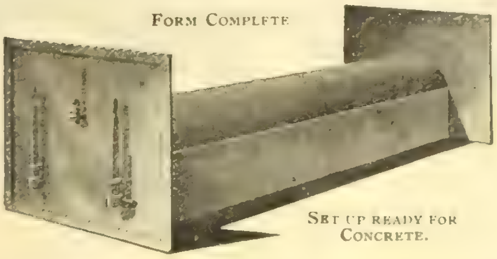
DIRECTORY OF PORTLAND CEMENT MANUFACTURERS together with manufacturers of Gypsum and Lime. The only directory of its kind. Gives a full list of the companies, their officers, capacity of plants, capitalization, process of burning, etc. Price $1.00 a copy, delivered.

The Cement Era Publishing Co.
1200-1210 Morton Bldg. - CHICAGO, ILL.

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.



Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

WRITE FOR FORM CATALOGUE
ENGINE CATALOGUE FOR THE ASKING
COMMISSIONER'S TIME BOOK FREE

Concrete Form & Engine Co.

Successor to Collapsible Steel Form Co.

83 Congress St., W., Detroit, Mich.

"A little fore-talk may save much after-talk in building—it is wisest to install the best first."

—The Philosopher of Metal Town.

Specify in the Contract

"Metallic"

Ceilings and Walls

When your specifications read "Metallic Ceilings and Walls", you are doing more than simply erecting a building — you are insuring **absolute satisfaction** for all parties concerned.

"Metallic" Ceilings and Walls are made of superior quality sheet steel—fit accurately, are durable and never sag, crack or fall off.

The exclusive patterns are varied and extensive, beautiful in design and very heavily embossed.

Our booklet, "Interior Decoration in Metal," will interest you. Write for it, also our new catalogue, No. 70—it contains valuable information on Metallic Building Materials.

Manufacturers 1952

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

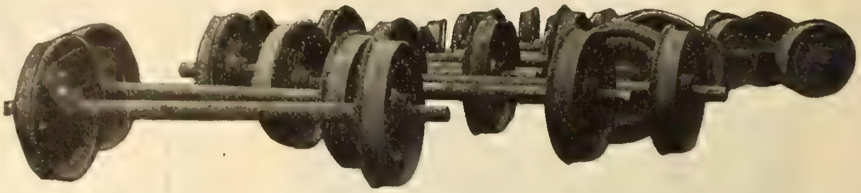
Main Office - 90 West Street
New York City

Bryan for Doors

We manufacture a line of high class doors for all parts of house finish. Our interior trim and fine interior hardwoods will give the building they are put into an artistic finish.

[illegible]

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario



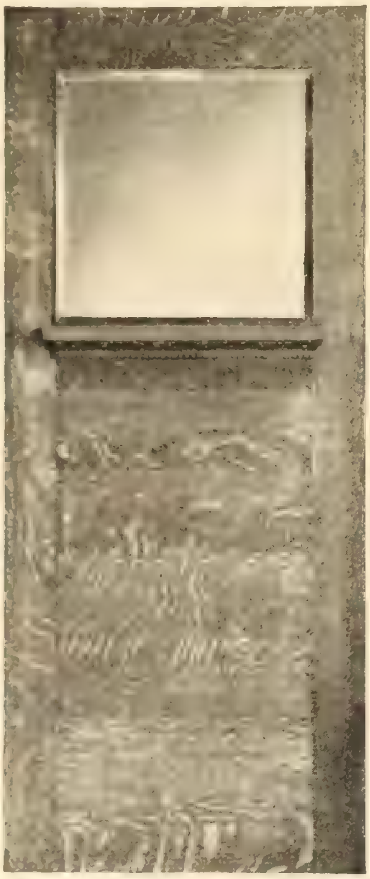
RAILWAY CONSTRUCTION PLANT

Hoisting Engines, Horse Powers, Hand Winches, Derricks, Car Wheels, Axles and Boxes, Dump Cars, Rail Cars, Buckets

MARSH & HENTHORN, Limited
Makers of Hoisting Machinery, BELLEVILLE, ONT.

Send for Catalogue

SALES AGENTS
MUSSENS
LIMITED
Montreal, Que.



DOORS
Pine and Veneered Hardwood

Midland Brand

Our stock of Doors is most complete, all we want is your order. We are prepared to take care of any amount of business you may give us. Our doors are made to get business and to keep it.

Will you send us your next order?

Georgian Bay Shook Mills, Limited
MIDLAND, ONTARIO

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

The Carey Roof Standard
CAREY'S FLEXIBLE CEMENT ROOFING

TO PROVE TO YOU the high, standardized construction and composition of Carey's Roofing, we want to send you BOOKLET AND SAMPLE FREE, and give you practical information regarding Carey's Roofing based on 25 years' actual time-proved tests Carey's Roofing is equally adapted to flat or steep surfaces, wood sheathing, tile or concrete. Whether your contract is large or small, we want to show you the advantage of using a standardized roofing material. THE PHILIP CAREY MFG. CO., 60 Wayne Ave. Cincinnati, O. 50 Branches.

"FAMOUS FOR DURABILITY"

12,000 Cement Brick
A Day—One Man
Material Furnished on the
Peerless Brick Machine

PEERLESS PAT'D.

1911 Model

The PEERLESS is a moderate priced machine on which you can make more perfect brick per day than on any other. Brick are made face down and delivered face up on pallet board. Cement brick find ready sale. We tell you how to start a profitable business.

Get Our Catalogue.

Peerless Brick Machine Company
No. 8 N. 6th St., Minneapolis, Minn.
Canadian Office: 92 Adelaide St. West, Toronto, Ont.
Machines for Canadian Trade are manufactured in Toronto, Ont.
Awarded Diploma by Canadian National Exhibition,
Toronto, Ont., 1909.

200 MORE BRICK A DAY
with
Renfrew Lime

That is what the bricklayers who use it say, and they are the men who know.

With this fact before you why continue to use other lime that cannot be worked so easily?

Yes, your freight rate may be a little higher but it's worth it.

ALWAYS USE
"Renfrew" the Lime of Quality

Jamieson Lime Co.
RENFREW, ONTARIO

White Lime - Stone - Grey Lime
Brick - Drain Tile

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

SOLE LICENSEES AND MANUFACTURERS FOR CANADA

Gardiner & Gaskill, 505 Power Bldg.
Montreal, Que.

Telephone Main 159

The Smith Marble and Construction Co., Ltd.

Montreal

Office & Factory:
145 Van Horn Ave.

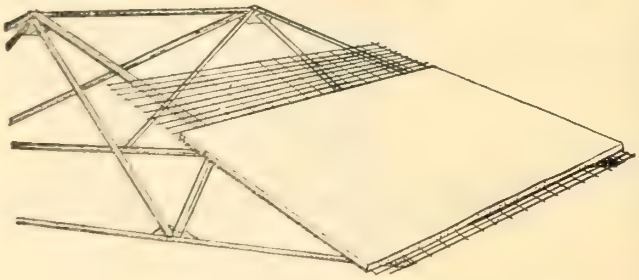
Show Rooms:
458 Blury Street

Importers,
Manufacturers,
Contractors

OF

Interior and Exterior Marble, Slate, Floor and Wall Tiles, Mosaics, Plumers and Electrical Marble, Granites for Building and Monumental Work.

Concrete Reinforcement



Our Bonding is a Crimped STEEL WIRE Fabric

Can be made in any Length or Width to suit you.

We claim in the erection of roofs and floors our continuous reinforcement has no superior, inasmuch as it knits the entire mass into an actual monolithic slab, weak at no point and so tied together that in case of accident from any cause whatever, no single section would fall but would be sustained by carrying capacity of wires running in continuous lengths over top of roof trusses or purlins

Inquiries Solicited

When in Need of—

Ornamental

Wire and Iron Work

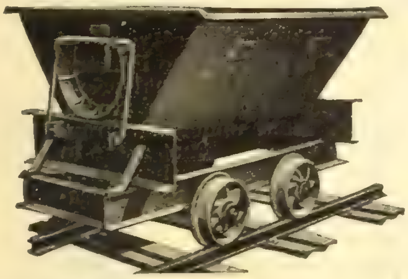
SEND US YOUR ENQUIRIES

We specialize in

Jail and Prison Work

Canada Wire Goods Mfg. Co., Hamilton

CARS - BUCKETS - SCREENS



IF you require any equipment send for our Catalog No. 31-A which illustrates a complete line of this material.

¶ We make any kind of Car or Bucket you want for handling concrete—clay—stone—cement blocks—or anything else.

Carry Standard Sizes in Stock

Write us we can save you money

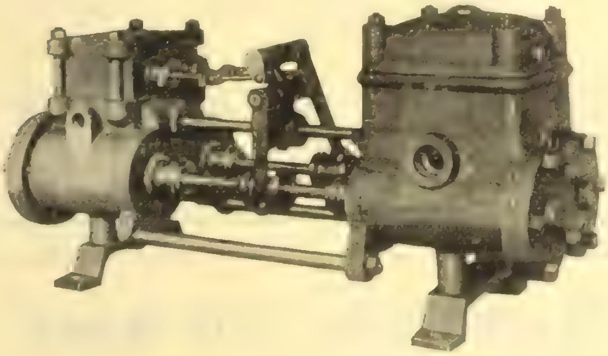
SACKETT - CHICAGO

High Quality
Low Prices
Quick Shipments

1691 Elston Ave., Chicago, Ill.

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.



The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
Limited
Toronto, Canada

Armstrong
CRANES

Built for Every Service
up to 75 tons capacity

Electric Traveling Cranes, Standard
Electric Traveling Cranes, Special
Electric Gantry Cranes
Electric Jib Cranes
Hand Operated Cranes
Locomotive Cranes
Hydraulic Cranes

H. J. ARMSTRONG
Engineer and Manufacturer
Markdale, Ont., Can.

Fred Holmes, President C. P. Holmes, Sec'y-Treas.

Telephone North 663

Fred Holmes & Sons
Limited
Building Contractors

1113 Yonge St., Toronto

SHAWMUT VITRIFIED PAVING BRICK WORKS

SHAWMUT, PA. ALFRED YATES, GEN. MGR

Vitrified Shale and Fire Clay
Paving Bricks and Blocks

Burned in Yates' Patent Kiln

Samples and Prices on Application

Note tremendous metal weight on this floor. Entire building of Alsen's Cement, reinforced concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Sand & Supplies
LIMITED

'Water-washed' & Gravel

Crushed Granite
Crushed Stone

Spadina Dock, Toronto

Phone M. 4507
1217

Interior Finish
in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston,n Otario

"The best is cheapest"

"Sanorto"
Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application Estimates on all classes of work free. Distance no object. Write for samples

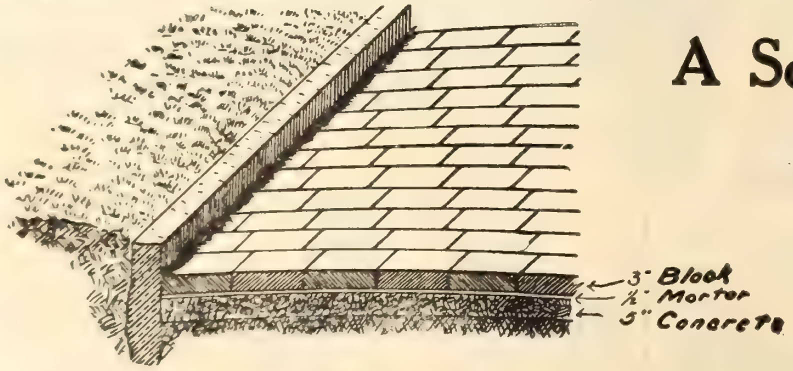
The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.

EVERYTHING YOU WANT
in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement
must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by
Asphalt Block Pavements
Send for Descriptive Literature

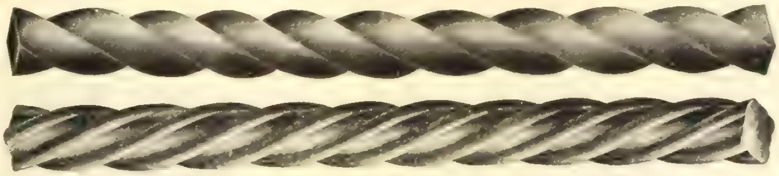
The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N.Y. "Suburbs of Buffalo, N.Y."

Toronto Office
117 Home Life Building

Producers of the Celebrated

"Peerless"
Bedford Stone

Bedford Indiana Limestone

Mill Blocks
Sawed Planed and Turned Stone

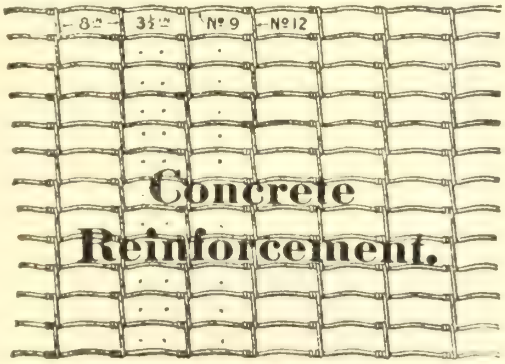
W. McMILLAN & SON
(Incorporated)
General Offices
Chamber of Commerce Building
CHICAGO, ILL.

Quarries and Mills { Bedford, Ind.
Bloomington, Ind.

Concrete Reinforcement

In 3½ ft. Rolled Units

Page Concrete Reinforcement with a 3½ x 8 mesh, and running wires of 2,200 lb. tensile strength is used on the Harbour Commission Elevator, Montreal, Soulanges Canal, etc. It replaced on the Chambly Dam reconstruction on the Richelieu, a reinforcing that failed, although of large reputaton. This is proof of its quality. It really reinforces concrete work under heavy stresses.



Put up in rolls for easy transportation. Running wires of high carbon steel, not bent or kinked, and of full strength. For adaptable and safe reinforcing of concrete, in dam, retaining wall, and bridge work, factory and foundation work, etc.

PARTICULARS, QUOTATIONS AND SAMPLE ON REQUEST.

Page Wire Fence Company, Limited
Walkerville, Ont.
Toronto Montreal St. John

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickess and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

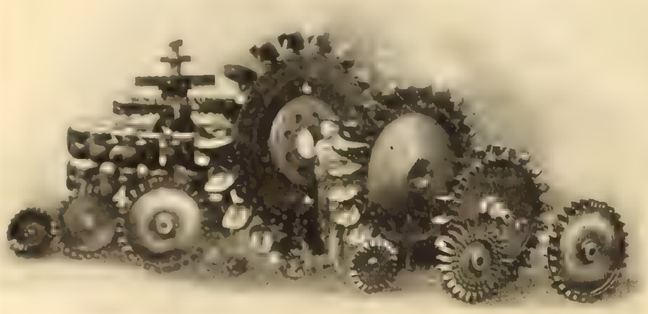
To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

Manufactured by

H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal

Water-Power Plants
Turbine-units from 1-4 up to 18,000 H.P. built



for any head and any output
—Highest efficiency—
CENTRIFUGAL PUMP, PAPER MAKING
MACHINERY, AIR COMPRESSORS
Apply to
Escher Wyss & Co.
Water Power Engineers
Canadian Office:
TORONTO - - Lumsden Buildings, R. 408

Tiffin Flushers, Sprinklers, Dump Wagons

Garbage, Street Cleaning Carts
and Municipal Devices
The Most Complete and Perfect Line Made in the United States
THE TIFFIN WAGON CO.
Tiffin, Ohio

SCANDINAVIA BELTING

For Conveying and Transmission
May be used either Indoors or Outdoors

Federal Engineering & Supplies, Limited
284 Yonge St., Toronto
329 St. James St., Montreal
STOCK CARRIED AT
Kinnear & Co., St. John, N. B. G. B. Oland & Co., Halifax, N. S.
Jos. Oullet, 12 Rue Caron, Quebec, P.Q. McDougald's Ltd. Ottawa, Ont.

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U.S.A.

PURE WATER

It is easy to obtain with our plants and apparatus

We design and contract for complete municipal filtration plants of any capacity.

We supply and install apparatus for sterilizing water supplies by the application of calcium hypochlorite.

Literature, Sketches, Estimates and Recommendations Supplied on Request

American Water Softener Co.
1001 Chestnut St., PHILADELPHIA, Pa.

We have no affiliations or working acquirements with any of our competitors.

Terra-Cotta Fireproofing

Get an Estimate from

ROBERT BENNETT
Contractor

347½ Euclid Avenue, Toronto

Over 25 years experience in U. S. and Canada

PHONE COLLEGE 4362

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

The Contractor's "Money Saver"

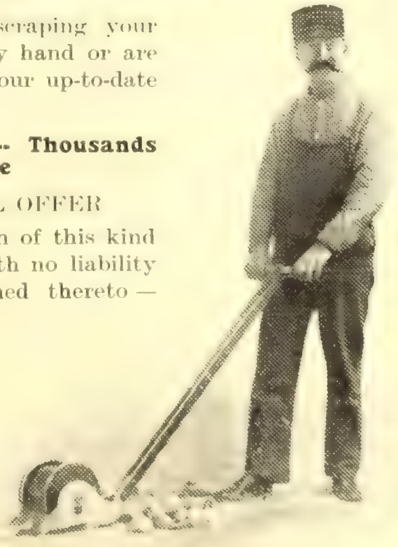
Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment --- Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto—write us **to-day.**

MACHINE
PAYS FOR
ITSELF
IN A FEW
DAYS.



"Little Giant Floor Scraper"

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President
Thos. C. Irving Jr., Vice-Pres.
Jas. W. Moffat, Secretary
Chas. Warnock, Treas. & Man.

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories Canadian Express Bldg., Montreal, Que.
Branch Offices, Traders Bank Building, Toronto, Ont.
Norfolk House, Laurence Pountney Hill, London, E.C.

The Tie that Binds

the wires in **PERFECTION MESH** for concrete reinforcement is a perfect attachment formed without heat or annealing. It is also splendid mechanical bond in the concrete.

PERFECTION MESH is the ideal reinforcement for spans up to eight feet. It's inexpensive too.

CLARENCE W. NOBLE

117 Home Life Building, TORONTO, ONT.

HY-RIB -

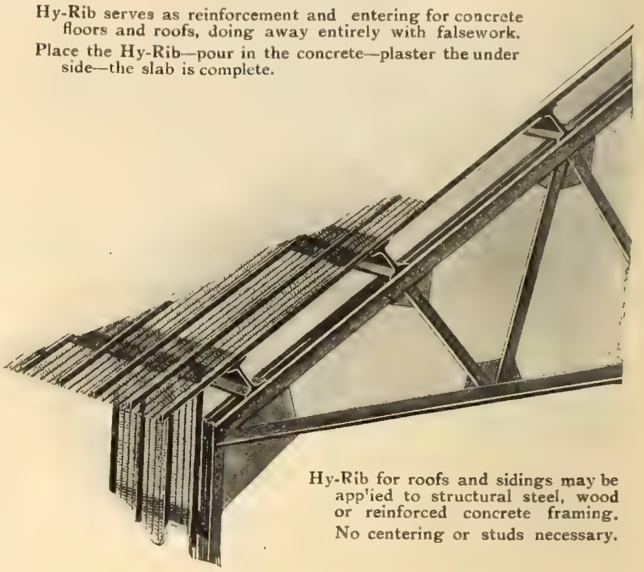
A Steel Lath with deep stiffening ribs made from the same sheet of steel.

Furnished in three weights of metal, Nos. 2, 3 and 4.
Ribs 13/16 inches high and 3½ inches center to center.
Sheets 10½ inches wide center to center of outside ribs.
Standard Lengths—6 ft., 8 ft., 10 ft. and 12 ft.

FLOORS AND ROOFS

Hy-Rib serves as reinforcement and entering for concrete floors and roofs, doing away entirely with falsework.

Place the Hy-Rib—pour in the concrete—plaster the under side—the slab is complete.



Hy-Rib for roofs and sidings may be applied to structural steel, wood or reinforced concrete framing. No centering or studs necessary.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office:	Branches:	Agencies:
Walkerville	Toronto, Winnipeg, Montreal, Vancouver,	Quebec, Halifax.

Steel Bridges
and Concrete Work

For over a quarter of a century we have been building Steel Highway Bridges throughout Canada.

Our experience is at your disposal.

We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

Get our figures before closing your contracts.

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

SATINETTE

When an Architect specifies Satinette he desires to enhance and protect the beauty of his design

When a Contractor recommends Satinette he shows his good taste

"Satinette"—the enamel that never turns yellow—is the most perfect and durable white enamel ever made.

"Satinette"—is suited for decorative work of every description—Gloss Interior and Flat Interior for interior work and Gloss Exterior for all exterior work.

"Satinette"—is always in evidence where elegance is of primary importance.

"Satinette"—makes an artistic, durable and Sanitary covering for house decoration.

Like all standard products "Satinette is the result of **much thought** and **experience and is now the most popular enamel finish** on the market.

All Standard Products are sold in full Imperial Measure Cans and manufactured by

International Varnish Co., Limited
TORONTO WINNIPEG

A28

for Highest Efficiency, Absolute Reliability, Greatest Economy

**Used by the Largest Mining Companies and Hydro-Electric Plants.
Also Extensively for Dredging, Exhaust Steam, Compressed Air, etc.**

Sizes 3 to 42″ Diameter up to ¼″ in thickness
Easily installed and securely connected with our Forged Steel Flanges or All Steel Bolted Joints.

Write for our Catalogue [illegible] and prices on your requirement

AMERICAN SPIRAL PIPE WORKS - MAIN OFFICE—CHICAGO
NEW YORK OFFICE—50 Church Street

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)
"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."
W. S. Downing, (Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, [illegible]

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.
1032 Garfield Building, CLEVELAND, OHIO
SELLING AGENTS
The Dominion Equipment & Supply Co., Winnipeg, Canada

Strengthen Your Concrete

BY USING

Guelph Hydrated Lime

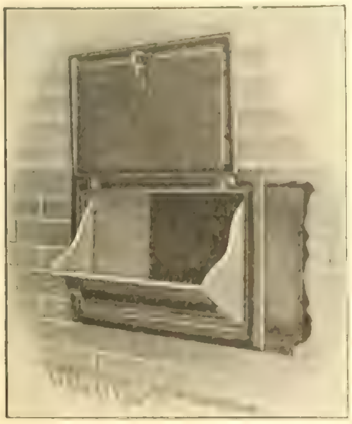
The engineer who is dealing with concrete construction can greatly strengthen his job by using **Guelph Hydrated Lime.**

It makes the work Waterproof, and a better color.

Specify **Guelph Hydrated Lime** and insist on your dealer supplying it.

Standard White Lime Co.

Guelph - Ontario



EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

[illegible]

The Down Draft Furnace Co., Limited

Galt, Ontario, Can.

Corinthian Stone

is extensively used for Church Buildings, in trimmings for brick or stone work, it is without an equal. Special prices for any work where a large quantity of repetition occurs. :: :: ::

Ingersoll Methodist Church—Architects, Messrs. Taylor & Taylor, Brantford

A large quantity of Corinthian Stone was used in the remodelling of this church. Estimates given for all classes of work. Send plans or write to :: :: :: :: ::

The Corinthian Stone Co.

OFFICE AND WORK:
G. T. R. JUNCTION, GUELPH, ONTARIO

Hamilton Pressed Brick

Start Right

by specifying Hamilton Pressed Brick for every job where a clean, smooth and distinctive effect is desired.

Hamilton Pressed Brick is made from shale, not clay, rich in Iron Oxide free from so called Soda. Besides furnishing this high class product we can fill your orders promptly. Connections with T. H. & B., C. P. R., G. T. R., M. C. R.

Hamilton Pressed Brick Company

Limited

Phones
Factory 992
Office 293
Residence 345

Spectator Building, Hamilton, Ont.

Chance's
Flemish Glass

A new product of the famous glass works of Chance Bros. & Co., Limited, near Birmingham, England.

"Flemish" is a new and most attractive variety of Ornamental Window Glass, unsurpassed in character and brilliancy. It is particularly effective in the best kinds of Leaded Light work, and for glazing in casements, door panels or interior partitions, where the object is to obscure the vision but not the light.

"Flemish" Glass is made in large and small patterns and in White, Staining White, and numerous Tints.

Chance's Figured Rolled Glass excels in depth and brilliancy of pattern, as well as in easy cutting qualities.

Chance's Double Rolled Cathedral is brighter and more translucent than the ordinary Cathedral, while it costs no more.

To Architects and Contractors we will send on request samples of any of these lines of Chance's Glass.

You will find them distinctly superior.

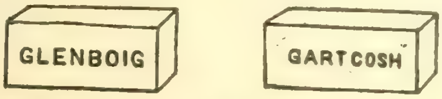
Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

Perfect Castings

can be obtained only when a practically perfect fire-brick is used in the furnace.



GLENBOIG

Fire-Bricks have been proved to be the most perfect brick on the market.

They withstand the highest heats without melting; changes of temperature without expansion or contraction and the consequent splitting-up, and keep the iron free from fire-brick in forging.

Have you our literature?

Stocks carried by all principal dealers

SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The

Missisquoi Marble Company

Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices :—

Eadie-Douglas, Ltd.	Toronto, Ont.
C. N. Barclay	Winnipeg Man.
Bosse & Banks	Quebec, Que.
General Contractors Supply Company, Ltd.	Halifax, N. S.
129 Sparks Street	Ottawa, Ont.
James Robertson Co. Ltd.	St. John, N. B.
G. R. Duncan	Fort William, Ont.
Walker & Barnes	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd.	Vancouver, B. C.
315 Coristine Building	Montreal, Que.

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Limited

Head Office (Manning Arcade)
24 King St. W. Phone Main 5913 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Everything for the Builder

At the Right Price

Interior Trim
Mouldings
Turnings
Stair Building
Lumber
Lath
Shingles
Sash
Veneer Doors
Pine Doors
Frames
"Empire Brand" Hardwood Flooring

LET US QUOTE YOU

J. R. Eaton & Sons
Limited
Orillia, Ontario

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 604 / 605 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd., & C.P.R. 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Concentration

is the secret of our success as Fitting Manufactures. All our efforts are directed towards one end, that is why

S BRAND

Cast Iron Fittings and Valves are Right

Have you seen our
"Everlasting" Blow-off Valve
SIMPLE AS A. B. C.

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

CRUSHED
All Sizes
STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES
THE STANDARD FOR ALMOST HALF A CENTURY
PROMPT SHIPMENTS
WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use
W. E. Seagrave Fire Apparatus
MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

TENTS
for Engineers and Contractors

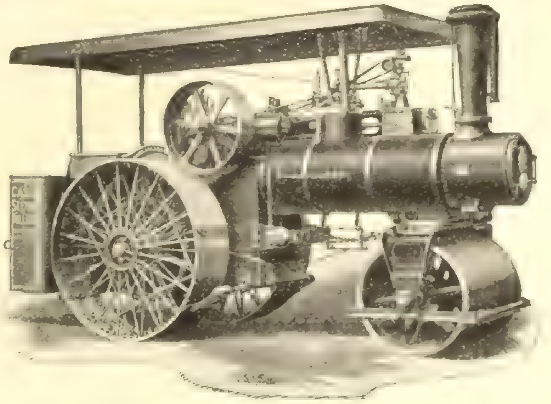
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

Woods Limited
Woods Building - Ottawa, Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT
THOROUGHLY REPAIRED — IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18" x 26" cylinder Mogul, Standard Gauge, and 18-10" x 14" Vulcan and Davenport dinkeys, 36" Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36" Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8" Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2 Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	Drag Scrapers and 1—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2 Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36" Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW

May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. & Dolland Lane - - MONTREAL, CANADA

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A.

Steel and Wood TANKS

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

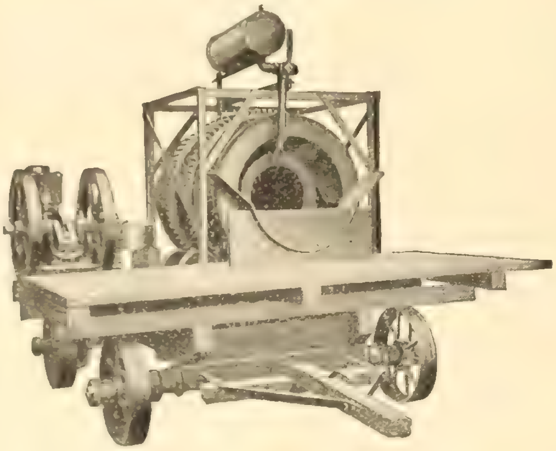
Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

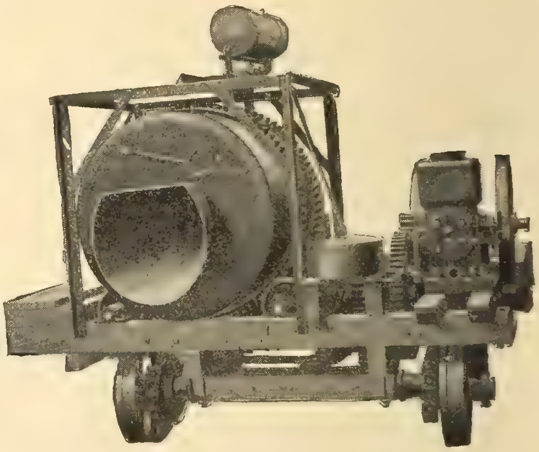
The Low Charging CROPP MIXER

The only Mixer that will not spill when overcharged

Low charge and high discharge covered by Patent 947196.



Either Steam or Gasoline Engine



Our Prices will Interest You

The only mixer having batch constantly in sight of operator.

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

THE
Thames Quarry Co.
St. Mary's, Ont.

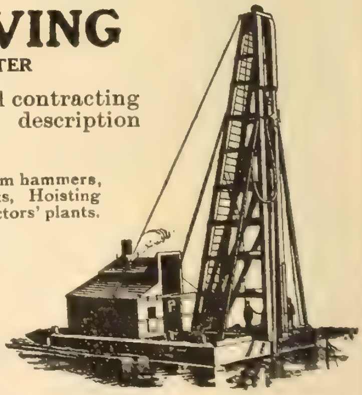
CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.



Lincoln Construction Co.

Office: 64 Niagara St.
St. Catharines, - Ont.

IRON STAIRS

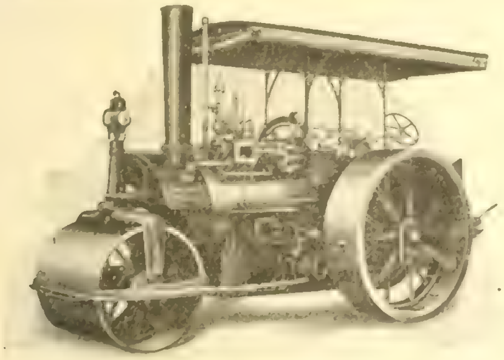
Dennis Wire & Iron Works Co.
London, Canada Limited

Toronto Offices - 12 QUEEN STREET E.

Cut shows a four wheel steam Locomotive Crane with 40ft. boom handling forms on New York Catskill Aqueduct at Valhalla, N.Y. These contractors are finding our cranes indispensable in this work, as they can be used for so many purposes; such as handling loose materials as broken stone, sand, concrete, etc., heavy timbers, rails, concrete forms, etc.

THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND, OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City

"A Canadian Roller
for Canadian Roads"



THE WATEROUS
DOUBLE CYLINDER
STEAM ROLLER

is built essentially to suit Canadian road building conditions. Over 100 Rollers in use in Canada to-day are proving their ability as road makers of the highest quality. A greater rolling capacity, with less cost of maintenance and operation, are its distinguishing characteristics. [illegible]

The Waterous Engine Works Co.
BRANTFORD, CANADA Limited

Agent:—Hugh Cameron & Co., 72 Queen St. E., Toronto, Ont

E. V. Alburty & Co. Ltd.

Building Materials

Lumber, Lath and Red Cedar Shingles

British Columbia Representatives

—FOR—

F. T. Crowe & Co., Seattle, Portland, Spokane and Tacoma.
North Western Terra Cotta Co., Chicago.
Gladding McBean & Co., San Francisco.
Hydraulic Pressed Brick Co., St. Louis
Ludowici-Celadon Co., St. Louis
Wadsworth, Howland Co., Boston
Dexter Bros., Boston.
Corrugated Bar Co., St. Louis.
St. Paul Sash, Door & Lumber Co., St. Paul.
Lickleys Limited, Toronto.

Some of our Specialties:

Plaster Board, Gypsinite Studdings and Furring, Lath Joint Hangers, Bay State Cement Coating Luxfer Side Walk and Window Prisms, Window Coal Chutes, Lowrie Wall Safes, Bank Fittings, Interior Hardwood Finish

We cater to the builder who wants Quality.

Our Prices are Reasonable

Vancouver Offices:
902-3-4 Dominion Trust Building
Phones 7855 - 6161
Vancouver, B. C.

Victoria Office
Times Building

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—
New York N.Y. - 71 Broadway
Baltimore, Md. - - Continental Trust Bldg.
Boston, Mass. - - - 70 Kilby Street
Chicago, Ill. - - - McCormick Building
Mexico City, Mex. - Edificio de "a Mutua"
Philadelphia, Pa. - - Morris Building
San Francisco, Cal. - - 1505 Chronicle Building
St. Louis, Mo. - - Commonwealth Trust Building
London, England - - 110 Cannon Street
Steelton, Penna. - - At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

Steel Plate and Structural Work

of every description

MacKinnon, Holmes & Co.

Limited

Civil and Mechancal Engineers,
Manufacturers, Contractors.

Head Office and Works:

Drummond Street - - - SHERBROOKE, QUE.

The

Phœnix Bridge & Iron Works

Limited

MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

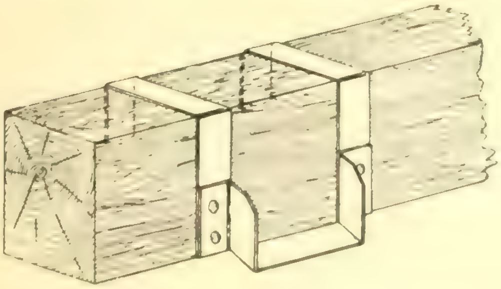
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

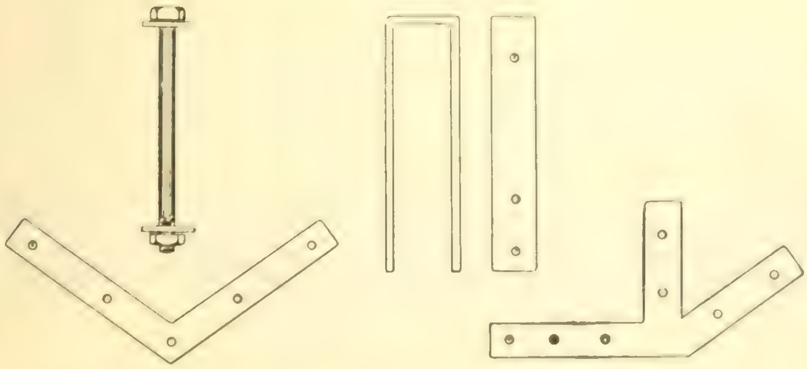
Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company, Ltd.

HAMILTON, ONT.



STEEL JOIST HANGERS, Single or Double



IRON FORGINGS, for Wooden Trusses, Apex Straps, Stirrups, Bolts and Rods made to order

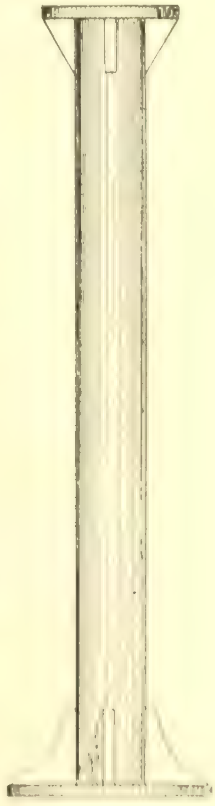
Beams,

Angles,

Channels,

Plates,

Any Size from 1½ inch to 24 inches, and any length up to 70 feet.



CAST IRON COLUMNS,
all sizes and designs

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners

Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

JAMES THOMSON, President. J. G. ALLAN Vice-President. JAMES A. THOMSON, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

PROMPT DELIVERIES

Fellowes and Fellowes

59 Yonge Street., TORONTO

Engineers' and Contractors' Machinery

Steel Dump Cars, Hoisting Engines, Derricks Pumps, new and second hand Rails and Cars, Turntables, Clam Shell and Orange Peel Buckets, etc. Contractors' Elevating and Conveying Machinery.

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridge's Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, **Toronto**

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, **Ottawa**

R. S. LEA and H. S. FERGUSON ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structures Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street East, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

---

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer. C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C.E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.

Consultations, Reports, Plans.

Suite 413, Pacific Block, **Vancouver, B. C.**

CONCRETE BARGES

SPECIFICATIONS AND PLANS OF
Reinforced Concrete Barges, Pontoons and Scows

PREPARED BY **James Taylor,**

CONSULTING AND INSPECTING ENGINEER,
MONTREAL

P.O. Box 95, Station B Enquiries Invited

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage
and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Allan Keefer

Architect

Ottawa, Ontario

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

H. SYD. HANCOCK Jr.

A. M. Can. Soc. C.E. A. M. Am. Soc. C.E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes. "Roman" building stone. "Milton" pressed bricks. Sanitary flooring, stone crushers, fire engines, &c.

T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St.
Montreal

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.85	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	...	15.00
91 to 95 "	...	17.50
Brass Goods, Valves, etc.		
96 to 100 "	...	20.50
101 to 105 "	...	24.00
106 to 110 "	...	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	...	...	14.00	10.50
90 u. i.	...	...	16.50	11.50
95 u. i.	...	...	18.00	13.50
100 u. i.	...	...	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 65 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95

Lead Pipe.

Lead pipe, 80 per cent. off; lead waste, 30 per cent. off; caulking lead, 4½ cents per lb.; traps and bends, 60 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 75 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

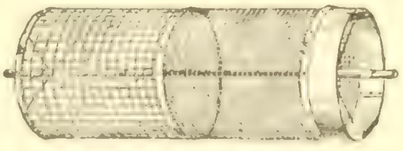
Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.35; ⅝-inch, $1.40.

Binder stone, $1.35 per ton, f.o.b. Toronto.

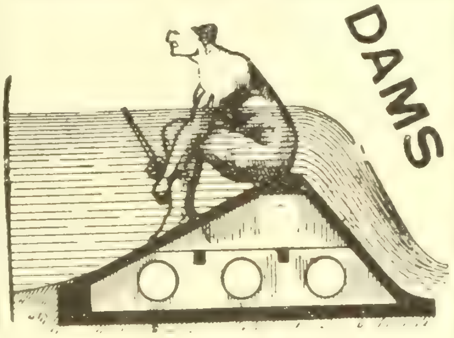
Rails for Contractors, Switches, Girders, etc.
New and Second Hand.
Locomotives and Cars
JOHN J. GARTSHORE
58 Front Street W., TORONTO

Arthur L. Weeks
Architect
Canada Life Building, Ottawa
Reinforced concrete and steel structures, factories and commercial buildings

We manufacture
Revolving Screens

and anything in the screen line.
Also railings, wire guards, grills etc.
Electro-plating and all metal finishes.
Estimates Given - Send for Catalogue
Crescent Wire & Iron Works
Partridge & Sons KINGSTON

Bonds of Suretyship for Officers and Em-
[illegible]
Bonds Bid and Supply in lieu of Certified
[illegible]
The
Guarantee Company of North America
[illegible]
Head Office - Montreal
[illegible]
[illegible]
[illegible]

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS
General Manager.
Head Office:
INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Barrett Specification Roofs

For Large Plants

FOR use on a large modern plant like the Arlington Mills illustrated below, only one kind of roofing is suitable, namely, Barrett Specification Roofs.

The roof area of these buildings is about 22½ acres, which includes saw-tooth, monitor and ordinary flat roofs, under which are valuable machinery and textiles, where a leak might do thousands of dollars worth of damage.

The roof practically gets exposure from both sides, because the humidity of the interior of the building (which is a neceesary feature of textile manufacturing) causes constant condensation of moisture on the under side of the roof.

No other style or type of roofing could be used economically.

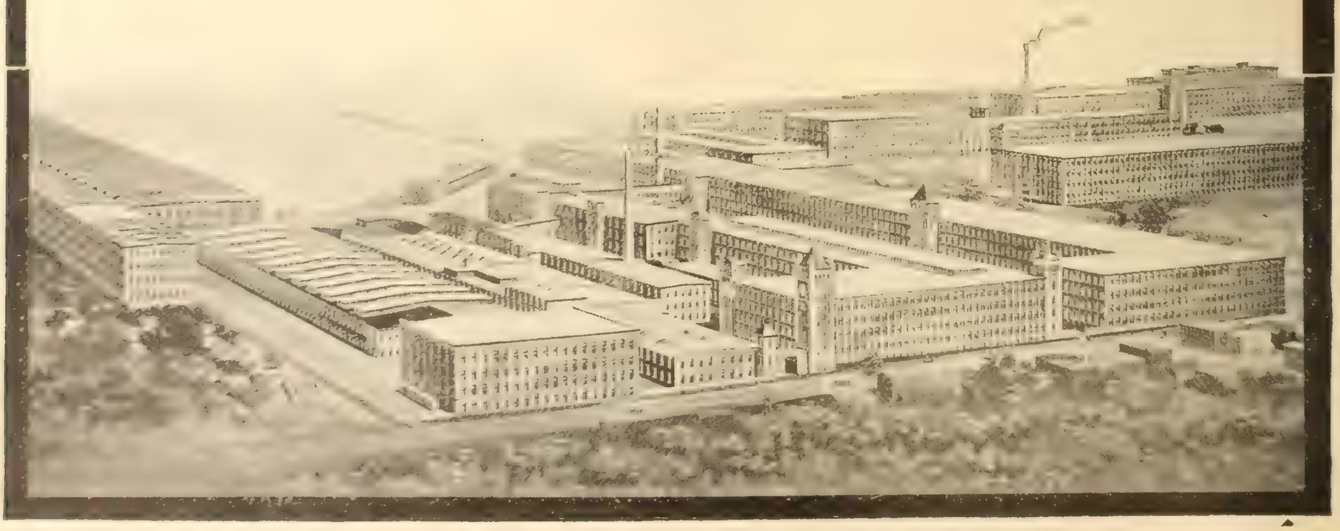
Tin and ready roofing would require painting every few years—and think of the cost of painting so vast an area ! Slate and shingles are not fitted for use on such buildings.

If ultimate economy is desired, a Barrett Specification Roof *must* be used, for its price is lower than that of other permanent roofs and, as it requires no painting, its maintenance cost is nothing. We can point to roofs of this type which have given faultless service for over thirty years without leaks and without repairs.

If you are interested in the roofing problem we suggest you write our nearest office and any information desired will be cheerfully furnished.

The Paterson Manufacturing Co., Limited

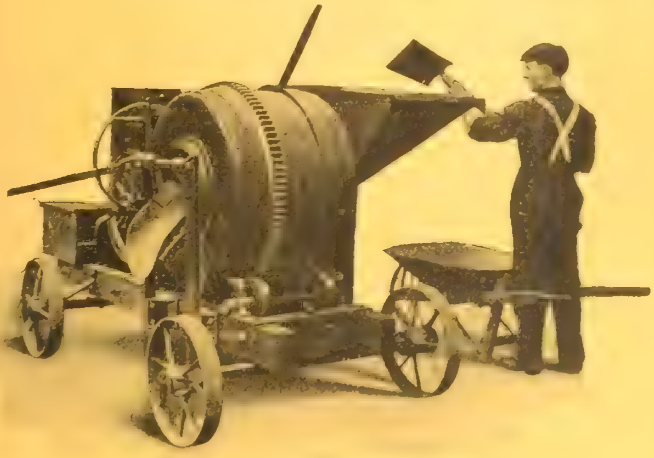
Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.



Arlington Mills, Lawrence, Mass. C. R. Makepeace & Co. Mill Engineers. Providence, R I.

Ransome Concrete Mixers

Electric, Gasoline and Steam Driven. All sizes



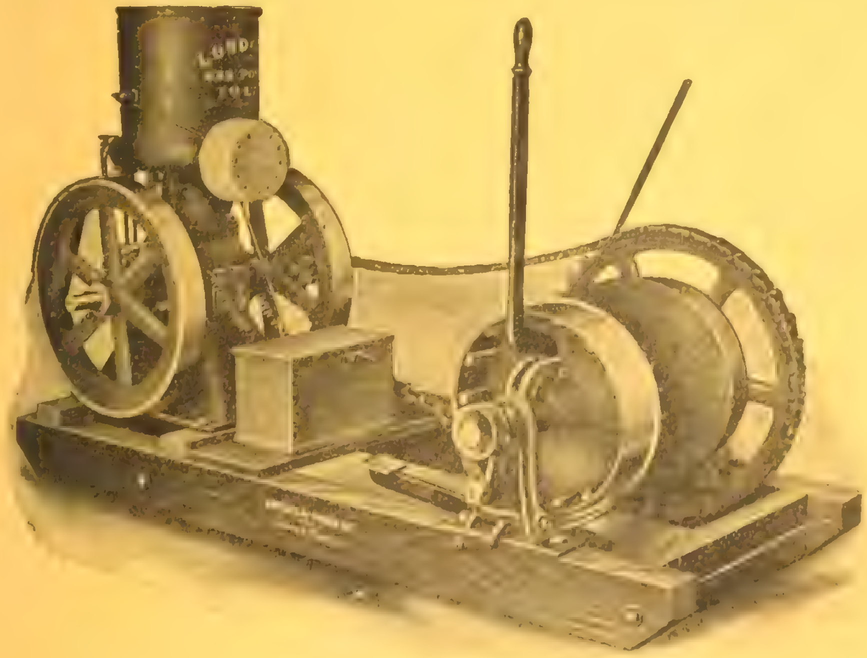
- Ransome Concrete two wheel run carts
- Ransome Hoist Buckets
- Ransome Concrete Bins
- Ransome Concrete Rotary Dump Cars
- Hoisting Engines
- Derricks
- Side and Corner Dump Cars
- Orange Peel
- Clam Shell Buckets

For Prices and Catalogues Write

Ritchie Contracting & Supply Company

Limited

7th Floor, Bower Building 543 Granville Street VANCOUVER, B. C.



Complete 5 H. P. Hoisting Outfit, Operating Side

Here is a Hoisting Outfit that Has Saved Money Let it Save Yours

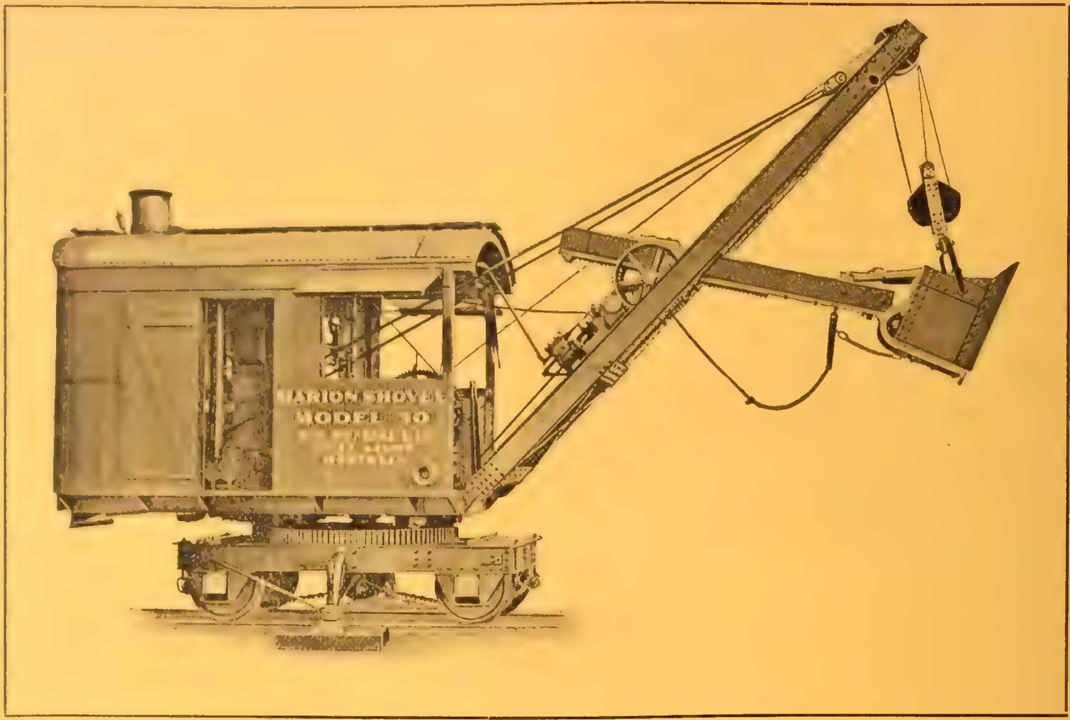
A **"London"** self contained engine mounted on the strong bolted frame with our famous **"London" Friction Clutch Hoist** with ball bearing thrust, will give you an outfit hard to beat.

The gearing consists of sprockets and heavy malleable iron chain.

Send for our Literature which contains complete description of the above outfit.

The London Gas Power Company Limited, London, Canada

ENGINEERS and MACHINISTS



"MARION"

Revolving Steam Shovels

Especially designed for

BRICK YARDS
ORE DOCKS
THOROUGH-CUT WORK
CONTRACTORS USE IN ROAD WORK
CELLAR EXCAVATING
LOADING COAL

Any similar operation where it is desired to deposit material within full circle swing.

Supplied with

½—⅝—¾—1¼ cubic yard Dippers

"MARION" Revolving Shovels are the most extensively used revolving shovels there are on the market today, which is abundant proof of their superiority in design, construction workmanship and efficiency over other makes of this type of shovel. Operated by one man. Supplied with Traction Wheels if desired.

Let us send you catalogue

F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man. and Vancouver, B.C.

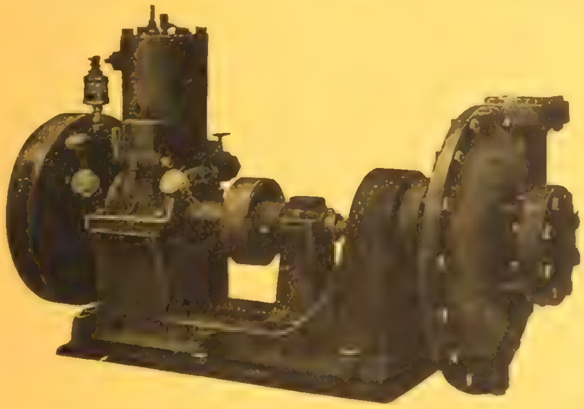
Vol. 25 Toronto, May 10, 1911 No. 19

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

We manufacture Steam and Power Pumps
Condensers, Travelling Cranes, etc.



WRITE FOR CATALOGUE

The **Smart-Turner Machine Company** Limited
HAMILTON, ONTARIO

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

TRADE MARK REDCLIFFE

TRADE MARK REDCLIFFE

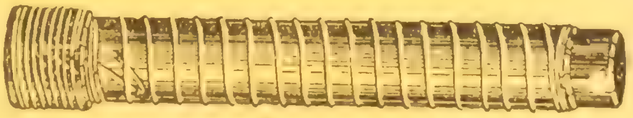
"Redcliffe"

Corrugated Iron

Gets the Preference when Quality Counts

John Lysaght, Limited
Makers
Bristol, Newport

A. C. Leslie & Co., Limited
MONTREAL
Managers, Canadian Branch



Continuous and Machine Banded Wood Stave

WATER PIPE

RESERVOIR TANKS

for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

---

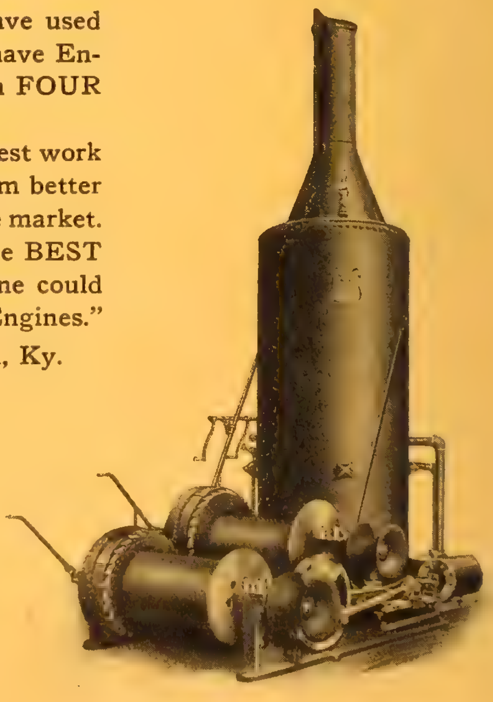
NOTE THE TONE OF THIS LETTER

"For the two 'AMERICAN' Engines which we have used for six years, we have paid very little for repairs. We have Engines of other makes on which the repair bills have been FOUR TIMES what we spent on the 'AMERICANS.'

We use these two engines for Pile Driving (the hardest work an engine is called upon to do), because we consider them better adapted to this kind of work than any other engine on the market.

The several 'AMERICAN' Derricks we have are the BEST WE HAVE EVER USED, and do not see how any one could make a mistake in buying 'AMERICAN' Derricks or Engines."

LANGHORNE & ALLEN, Oneonta, Ky.



THERE IS UNMISTAKABLE ENTHUSIASM AND SINCERITY IN THIS LETTER FROM CONTRACTORS WHO RANK HIGH IN THEIR PROFESSION

May we send you prices and information on "American" Machinery?

AMERICAN HOIST AND DERRICK CO.

ST. PAUL, U.S.A.

AUTHORIZED AGENTS—
Gorman, Clancey & Grindley, Edmonton and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot, Ltd., Vancouver, B.C.
J. L. Neilson & Co., 602, Main Street, Winnipeg, Man.
Dunn Brothers, Winnipeg, Man.
J. A. McTaggart, Winnipeg, Man.

It is perhaps not generally known

that we have an Information Department consisting of trained and practical men, whose time is employed solely in answering enquiries from people interested in cement.

Now it will be readily understood

that out of the mass of enquiries that come to us, there are a number that include questions as to what might be termed Allied Industries. These we now answer to the best of our ability, but we could answer them still more satisfactorily, if manufacturers of materials used in conjunction with cement would co-operate to the extent of sending copies of their catalogues and other literature to be placed on file in our office for reference.

We should like to obtain

the names and addresses, together with catalogues, and any other obtainable information of manufacturers of and dealers in:

1. **Concrete Machinery**
2. **Building Blocks**
3. **Cement Bricks**
4. **Tile Molds**
5. **Fence Posts**
6. **Re-inforcing Material**
7. **Water-proofing Compounds**

It is not alone for our own convenience that we make this suggestion; firms who manufacture or deal in such articles will find it to their own advantage to have this information in the hands of our Information Department, thereby enabling us to hand on to them from time to time enquiries for such materials as they severally make.

In sending catalogues, literature or information, please address same to "Sales Department."

The——

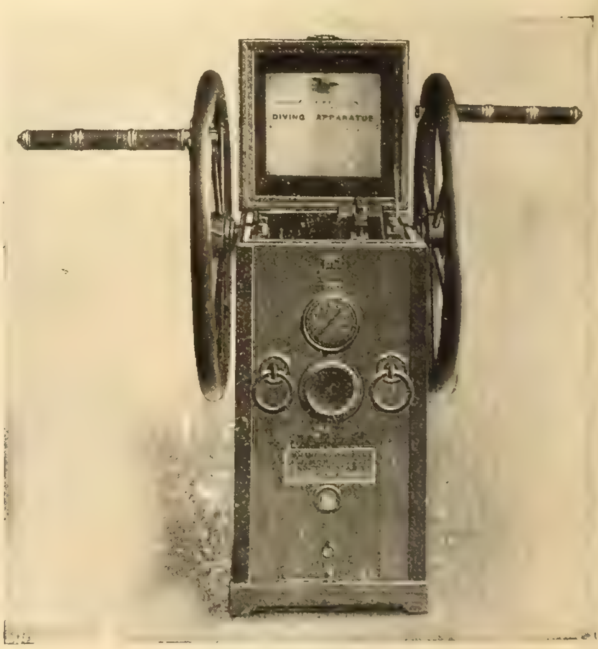
Canada Cement Company

Limited,

Banque National Building - - - MONTREAL

Morse Diving Apparatus

Complete Outfits Carried in Stock, with a Full Line of Accessories, such as Suits, Helmets, Shoes, Weights, Mittens, Cement, etc.



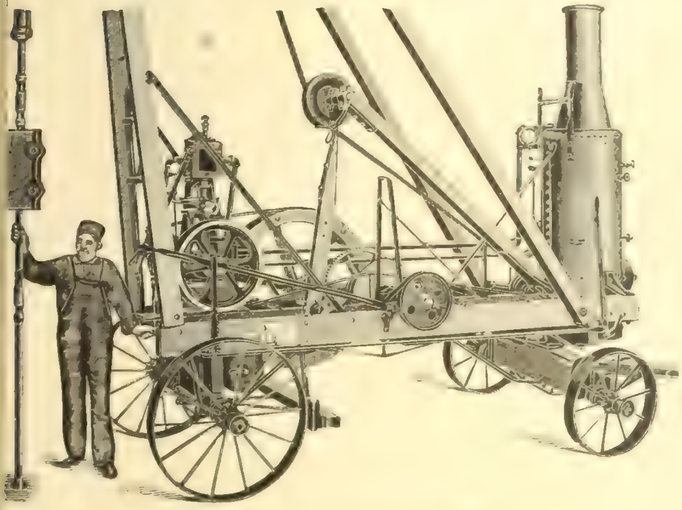
Morse Outfits are Standard

Send for Catalogue

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

CYCLONE DRILLS



Cyclone Contractor's Drill

For Deep Holes

As used by Contractors, Quarrymen, etc.

Supplied with or without power.

Steam or Gasoline.

Core Drills

Using Chilled Shot

Hand or Power

Cyclone Hand Power Core Drill

Economy Loader

"Economy" Loader

For Loading Deep Holes

SAVES YOUR POWDER

Send for Catalogues

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Crown Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architectural Iron Work	Page
Canada Wire Goods Mfg. Co	69
Dennis Wire & Iron Works	87
Meadows Co., Geo. B	49

Air Compressors	
Escher Wyss & Co	63

Air Valves, Automatic	
Marsh, J. P	84

Asphalt Plant	
East Iron Machine Co.	77

Buckets	
American Hoist & Derrick Co.	2
Sackett Screen & Shute Co.	

Belting	
Federal Engineering & Supplies, Ltd	72

Blowers	
Sturtevant Co., B. F.	25

Boilers	
Case Threshing Machine Co..	79
Inglis, John	61
Jenckes Machine Co.	2
Leonard & Sons, E	73
Marsh & Henthorn	66
McDougall Caledonian Iron Works	63
Mussens Limited	4
Waterous Engine Works Co.	83

Brick Machinery and Supplies	
Berg Mfg. Co.	
West C. S	
Whitehead, John	78

Brick	
American Enamelled Brick Co.	
Don Valley Brick Works	7
Hamilton Pressed Brick Co	
Milton Pressed Brick Co	
Port Credit Pressed Brick Co	82
Toronto Pressed Brick Co.	91

Brickmaker's Supplies	
Sackett Screen & Shute Co	

Bridges (Steel)	
Attica Bridge Co.	
Canadian Bridge Co	89
Cleveland Bridge Co.	89
Dickson Bridge Works	72
Dominion Bridge Co	80
Hunter Bridge and Boiler Works	74
Phoenix Bridge and Iron Works	89
Pennsylvania Steel Co.	88

Cement	
Alsen Portland Cement Co	70
Britnell & Co	70
Bremner, Alex	87
Canada Cement Co	3
McNally & Co., W.	85
Morrison & Co., T. A	88
Rogers, Alfred Limited	9

Concrete Pipe	
Dominion Concrete Co.	22
Lock Joint Pipe Co.	

Cement Waterproofing	
Ceresit Waterproofing Co.	27

Cranes, Travelling & Locomotive	
American Hoist & Derrick Co.	2
Armstrong, H. J.	
Brown Hoisting Machinery Co.	83
Males Co	58
Willis Shaw Machinery Co	58

Conduits	Page
Conduits Co., Limited	87

Crushed Stone and Granite	
Sand and Supplies	70

Concrete Mixers and Machinery	
Canada Foundry Co	20
Cropp Concrete Machinery Co.	84
Famous Block Machine Co.	71
Gould, Shapley & Muir	16
Hopkins & Co., F., H	92
Jenckes Machine Co	2
London Concrete Machinery Co	29
Milwaukee Mixer Co.	16
Mussens Limited	4
Morrison & Co., T. A.	88
Vining Bros.	73
Wettlaufer Bros..	10

Contractors' Plant	
American Hoist & Derrick Co.	2
Acme Eqpt. & Engineering Co	75
Beatty & Sons, M.	6
Hepburn, John T.	12
H & E. Lifting Jack Co	
Hopkins & Co., F. H.	92
International Marine Signal Co.	8
Willis Shaw Machinery Co.	58
Meaford Wheelbarrow Co.	70
Marsh & Henthorn	66
Montreal Locomotive Works	79
Mussens Limited	4
Oshkosh Logging Tool Co.	25
Ritchie Contractors Supply Co.	
Tiffin Wagon Co.	

Crushers (Stone and Rock)	
Berg Machinery Co	
Case Threshing Machine Co.	79
Hopkins & Co., F. H.	92
Jenckes Machine Co	2
Males Co	58
Mussens Limited	4
Morrison & Co., T. A.	88
Willis Shaw Machinery Co.	58

Corrugated Iron	
Galt Art Metal Co	62
Metallic Roofing Co	67
Metal Shingle and Siding Co.	
Ormsby, A. B., Limited	11
Roofers Supply Co	83

Contractors	
Bennett, Robt.	
Holmes, Fred.	
McIlwraith, Jas. A.	88
Nadel & Adler	88
Wells & Gray	26

Coal Handling Apparatus	
American Hoist & Derrick Co	2
Down Draft Furnace Co.	75

Derricks and Derrick Fittings	
American Hoist & Derrick Co.	2

Drills	
Beatty & Sons M	6
Canadian Rand Co	

Drilling Contractors	
Harvey, J.	89

Dredges	
Beatty & Sons, M	6
Males Co	58
Willis Shaw Machinery Co	58

Dry Kilns	Page
Sturtevant Co., B. F.	25

Electrical Apparatus, Motors	
Canada Ford Co.	

Engines	
Case Threshing Machine Co.	79
Canadian Boving Co	78
Inglis, John	61
Jenckes Machine Co	2
Leonard & Sons, E	73
Mussens Limited	4
Sturtevant Co., B. F.	25
Waterous Engine Works Co	83

Engineers (Civil) and Mechanical	
Barber & Young	88
Chipman & Power	88
Bowman & Connor	88
Farmer, John T.	88
Fuce, Edw. O.	88
Galt Engineering Co., John	88
Glaubitz, H. J.	88
Hancock, H. Syd	88
Inglis, John	61
Kennedy, Jas. C.	88
Lea & Ferguson	88
Mace, T. Harry	88
Mitchell, C. H.	88
McRae, John B	88
Moore & Scollan	88
Taylor, James	88

Exhaust Heads	
Sturtevant Co., B. F.	25

Filters	
American Water Softener Co.	

Friction Clutches	
Berg Machinery Co	

Field Instruments	
Gurley, W. & L. E.	66

Fire Brick	
Gibb, Alexander	79

Fire Apparatus	
Morrison & Co T. A.	88
Seagrave, W E.	80

Fireproof Doors and Windows	
Douglas Bros	18
Mussens Limited	4
Ormsby, A. B.	11

Gauges, Steam, etc.	
Marsh, Jas. P	80

Granite and Marble	
Laurentian Granite Co	89
Missisquoi Marble Co	79
Smith Marble & Construction Co.	

Glass	Page
Chance Brothers & Co.	
Consolidated Plate Glass Co.	
Luxfer Prism Co	27
Thompson & Co., B. & S. H	
Toronto Plate Glass Importing Co.	1

Heating Apparatus	
Jenckes Machine Co.	2
Leonard & Sons, E	73

Hoisting Machinery	
American Hoist & Derrick Co.	
Beatty & Sons, M	6
Canada Ford Co.	30
Inglis, John	61
Jenckes Machine Co	2
Hopkins & Co., F. H.	92
London Gas Power Co	91
Marsh & Henthorn	66
Mussens Limited	4
Sturtevant Co., B F.	25

High Pressure Pipe Lines	
Escher Wyss & Co	63

Hydrants	
Canada Iron Corporation	87
Gartshore-Thomson Pipe Co	86
Kerr Engine Co	13

Interior Finish and Doors	
Anglin, S.	70
Batts Limited	77
Canada Office & School Furniture Co	
DeLaplante, Ltd.	79
Bryan Mfg. Co.	67
Eaton & Sons, J. R.	70
Georgian Bay Shook Mills	
Rhodes Curry & Co.	
Sanitary Floor Co.	66
Tillson Co.	27
Wilson Bros.	69

Lime	
Christie, Henderson & Co.	80
Jamieson Lime Co	
Standard White Lime Co	75

Metal Lath	
Galt Art Metal	62
Metallic Roofing Co.	67
Noble C. W.	78

Meters	
Hopkins & Co., F. H.	92
McDougall Caledonian Iron Works	63
Neptune Meter Co	67

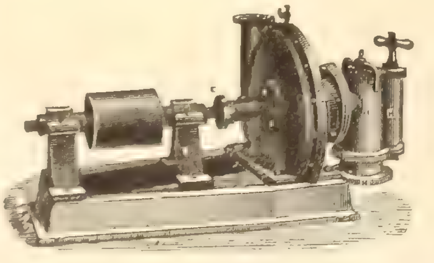
Paving and Paving Materials	
Dominion Carbolineum Works	14
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	66
Shawmut Paving Brick Co.	
Silica Barytic Stone Co. of Ontario	89

(Continued on page 10)

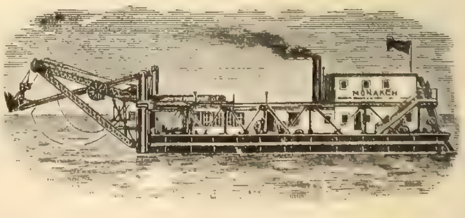
M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.

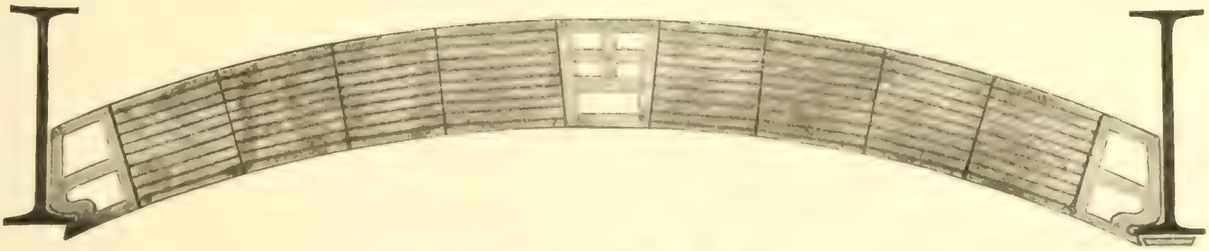


Don Valley Bricks

and Porous Terra Cotta Fireproofing

suited for every purpose of fireproof construction.

Column Covering **Furring**
Arches **Blocks**



T. C. Fire Proofing of Quality

DON VALLEY

Pressed Brick Enamelled Brick
Vitrified Brick Wire-Cut Brick
Porous Terra Cotta Brick

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: David McGill, 206 Merchants Bank Chambers

SIMPLE PERFECT

CLEAN WATER

For MANUFACTURERS or MUNICIPALITIES

Can be obtained by using the

"TORRENT" or "PULSOMETER"

FILTER

Complete information furnished on request

International Marine Signal Company Limited

OTTAWA, CANADA

GRAVITY PRESSURE

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Page
[illegible] Mfg. Co.	
[illegible] & Co.	8
[illegible] H. W.	8

Pipe

American Spiral Pipe Works	
Canadian Pipe Co	8
Dominion Wood Pipe Co	[illegible]
Dominion [illegible] Co	22
Gartshore Thomson Pipe Co	86
Lock Joint Pipe Co	17
Munderloh & Co.	11
National Iron Works	87
Pacific Coast Pipe Co	[illegible]
Pedlar People	8

Plumbers' Supplies

Standard Ideal Co	90

Power Engines

Inglis Co., John	61

Paints and Varnishes

Glidden Varnish Co.	
International Varnish Co	74
Paterson Mfg Co	90

Pile Driving Machinery

American Hoist & Derrick Co.	2
[illegible] Construction Co.	82

Pumps and Pumping Machinery

American Well Works	
Beatty & Sons, M.	6
Escher Wyss & Co.	63
Goulds Pump Co	73
Hopkins & Co., F. H.	92
Inglis Co., John	61
Leonard & Sons, E.	73
Martin Pump and Machine Co.	
McDougall Caledonian Iron Works	63
Mussens Limited	4
Ontario Wind Engine & Pump Co.	82
Smart-Turner Machine Co.	1
Waterous Engine Works Co	83

Roofing Contractors

Schwoerer & Sons, A.	25

Roofing Materials

	Page
Asbestos Mfg Co.	24
Bird & Son, F. W.	
Galt Art Metal Co.	62
Metallic Roofing Co.	61
Metal Shingle & Siding Co.	
Noble, Clarence W	74
Paterson Mfg Co.	90
Philip Carey Co	
Roofers Supply Co.	87
Standard Paint Co.	

Railway Supplies

Gartshore, John J.	89
Hopkins & Co., F. H.	92
Mussens Limited	4

Reinforcements. Concrete and Steel

Ambursen Hydraulic Construct'n Co.	89
Canada Wire Goods Mfg. Co.	66
Concrete Form Engine Co.	67
Steel Co. of Canada	23
Steel & Radiation	19
Trussed Concrete Steel Co.	74
Turner, C. A. P.	69

Road Machinery

Case Threshing Machine Co.	
Hamilton Machinery Co.	15
Morrison & Co., T. A	88
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co.	20
Hopkins & Co., F. H.	92
Mussens Limited.	4
Males Co.	58
Willis Shaw Machinery Co.	58

Stone

Britnell & Co.	80
Brodie, Jas.	
Christie, Henderson & Co.	80
Consolidated Stone Co.	72
Contractors' Supply Co.	80
Corinthian Stone Co.	
Crushed Stone, Limited	73
Doolittle & Wilcox	66
Hagersville Contracting Co.	11

Sand and Gravel

Sand & Supplies	63

Stone

	Page
Laurentian Granite Co.	88
McMillan & Son, R.	
Morrison & Co., T. A.	88
Myers, Oakley	73
Roman Stone Co	64
Sackville Freestone Co.	8
Sand & Supplies	70
Thames Quarry Co.	82

Steam Apparatus

Sturtevant Co., B. F.	25

Submarine Diver

Rouleau, Joseph N.	89

Structural Iron and Steel

Buffalo Steel Co.	
Dominion Bridge Co	84
Steel Co. of Canada	23
MacKinnon Holmes & Co.	
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	89
Salter, W. H.	85
Steel & Radiation	19

Sewer Pipe

Britnell & Co	80
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
GartshoreThomson Pipe Co.	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	17
National Iron Works	87
Ontario Sewer Pipe Co	21
Standard Drain Pipe Co.	21

Stationary and Power Engines

Case Threshing Machine Co	79

Slate

Roofers Supply Co.	87

Steel Shingles and Ceilings

Galt Art Metal Co.	62

Smoke Stacks

Leonard & Son, E.	73

Tents

Woods Limited	79

Safes and Vaults

Taylor, J & J	85

Testing and Inspection Bureau

Hunt & Co., Robt. W.	73

Stone Saws

	Page
Anderson, Geo.	18

Tiles

Smith Marble & Construction Co.	

Tanks and Stand Pipes

Berg Machinery Co.	
Inglis, John	61
Jenckes Machine Co.	2
Leonard & Sons, E.	73
Marsh & Henthorn	66
McDougall Caledonian Iron Works.	63
Ontario Wind Engine & Pump Co.	82

Trade Journals

Castellanos, A. W.	82

Valves

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co.	86
Kerr Engine Co.	13
Marsh & Co, Jas.	80
Standard Fitting & Valve Co.	80

Ventilating and Heating Apparatus

Gardiner & Gaskill	
Sturtevant Co., B. F.	25

Water Softeners and Filters

Berg Machinery Co.	
American Water Softener	

Wire Rope

Greening Wire Co., B.	
Smith, Thos. & Wm.	
Steel Co. of Canada	23

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	66
Crescent Wire Iron Works.	
Sackett Screen & Shute Co	

Water Wheels

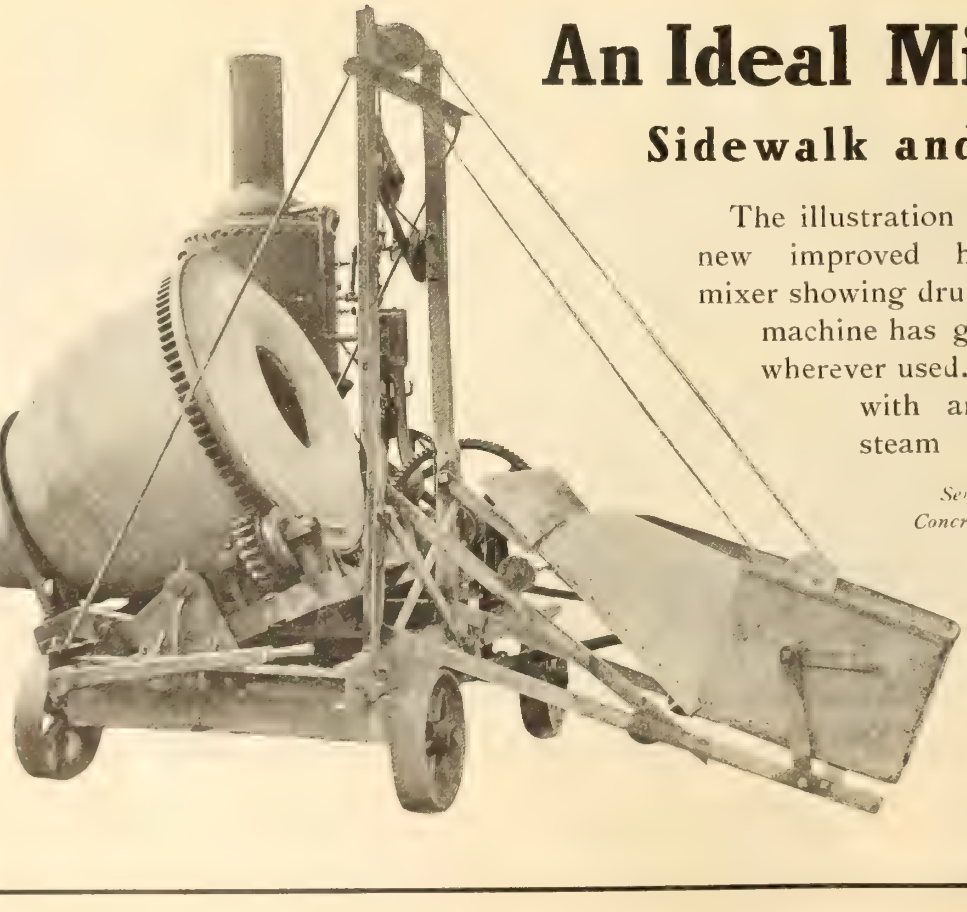
McDougall Caledonian Iron Works.	63
Canadian Boving Co.	78

Water Turbines

Escher Wyss & Co.	63

Wheelbarrows

Sackett Screen & Shute Co.	



An Ideal Mixer For

Sidewalk and Roadwork

The illustration shows the Wettlaufer new improved half-yard heart-shape mixer showing drum discharging. This machine has given excellent results wherever used. It can be equipped with any power desired — steam electric or gasoline.

Send for our Catalogue of Concrete Mixers and Machinery

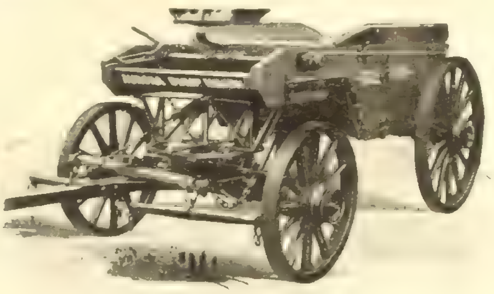
Wettlaufer Bros.
178 Spadina Ave.,
Toronto

A.R. Williams Machinery Company, 15 Dock St., St. John, N. B.
W. E. Ransome, Moosejaw, Sask.

MUNDERLOH & Co Ld.
MONTREAL.
SEAMLESS STEEL TRACTION AND LIGHTING POLES.
MANNESMANN SEAMLESS STEEL PIPES.
FOR GAS & WATER MAINS.
IN LENGTHS UP TO 40 FEET.
AN IMPROVEMENT ON CAST IRON.
ALL PIPES TESTED 75 ATMOSPHERES BEFORE LEAVING WORKS.
WRITE US FOR ILLUSTRATED BOOKLET.
SEND US YOUR ENQUIRIES.
WE ARE SOLE AGENTS IN CANADA FOR—
MANNESMANN TUBES.
FOR ALL PURPOSES.

THE STRENGTH OF OAK WITH 40 PER CENT SAVING IN WEIGHT

That's the saving effected by constructing the bed of selected Washington Fir, and its just one of the many reasons why lightest weight is combined with greatest strength in the



"Aurora" Dump Waggon

Built low for easy loading, coupled short for lightest draft only 7 feet 4 inch wheel base.

Chains entirely outside of bed, direct pull of chain on doors and length of chains adjustable.

Slotted hinges on doors give vertical movement, preventing installing team on dump.

Study its sturdy construction—its mechanical, labor-saving and dependable qualities. Catalog for the asking.

Western Wheeled Scraper Co.
AURORA, ILL.

You're A Busy Man

That's one of the reasons why we made this Catalogue so complete. The illustrations in every instance are from photographs, you see **just what we give you.** We guarantee you that if **ORMSBY 'UNDERWRITERS' Fire-proof Doors are specified** you will be relieved of all worry and bother. Your client gets the benefit when our goods are specified. We give you **real** service.

A. B. Ormsby, Limited
Experts in Fireproof Windows and Doors
Factories: TORONTO and WINNIPEG

"HAGERSVILLE"
CRUSHED STONE
FOR
CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: HAGERSVILLE, ONT.

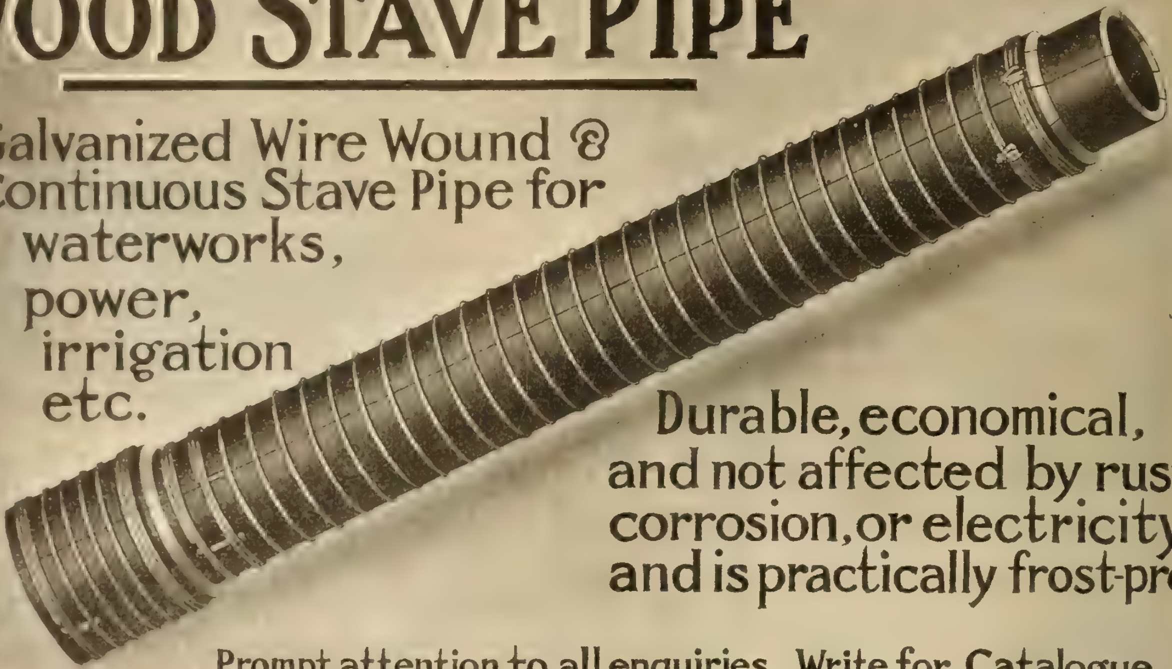
SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R.
and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

WOOD STAVE PIPE

Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.



Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Have you any use for a Derrick?

There are large plans under way. Large contracts are being placed. In all directions there is bustle and activity. Everything points to an unusually busy season for construction work of all kinds. But what about equipment?

John T. Hepburn

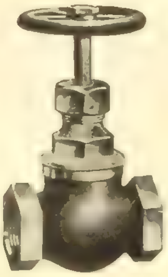
Scotch Derricks

are in use by all leading contractors in all parts of the country. They are designed and built for hard work, combining safety and high efficiency, with low operating cost. Being made in standard sizes, any part can be replaced at short notice. They may be operated by hand or power—are fitted with single and double purchase gears—powerful band brake—and safety locking device that prevents boom from falling.

We are busy now. We shall be busier in two or three weeks
Better place your order to-day to secure early delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

Water Crane and
Hydrant Combination



Indicator for Fire
Protection Valve

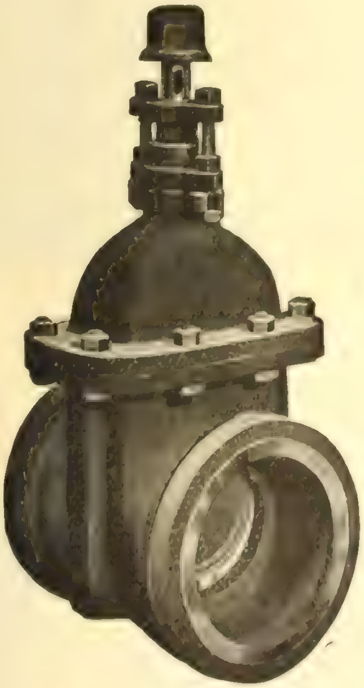
KERR

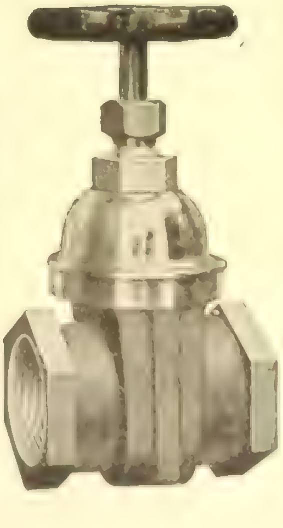
For City Waterworks

We manufacture valves and hydrants for every branch of city and town waterworks. If you are in charge of any waterworks' extensions, be sure you find out about "Kerr" goods before you prepare your specifications; then specify "Kerr."

Have you copy of our Catalogue?

VALVES



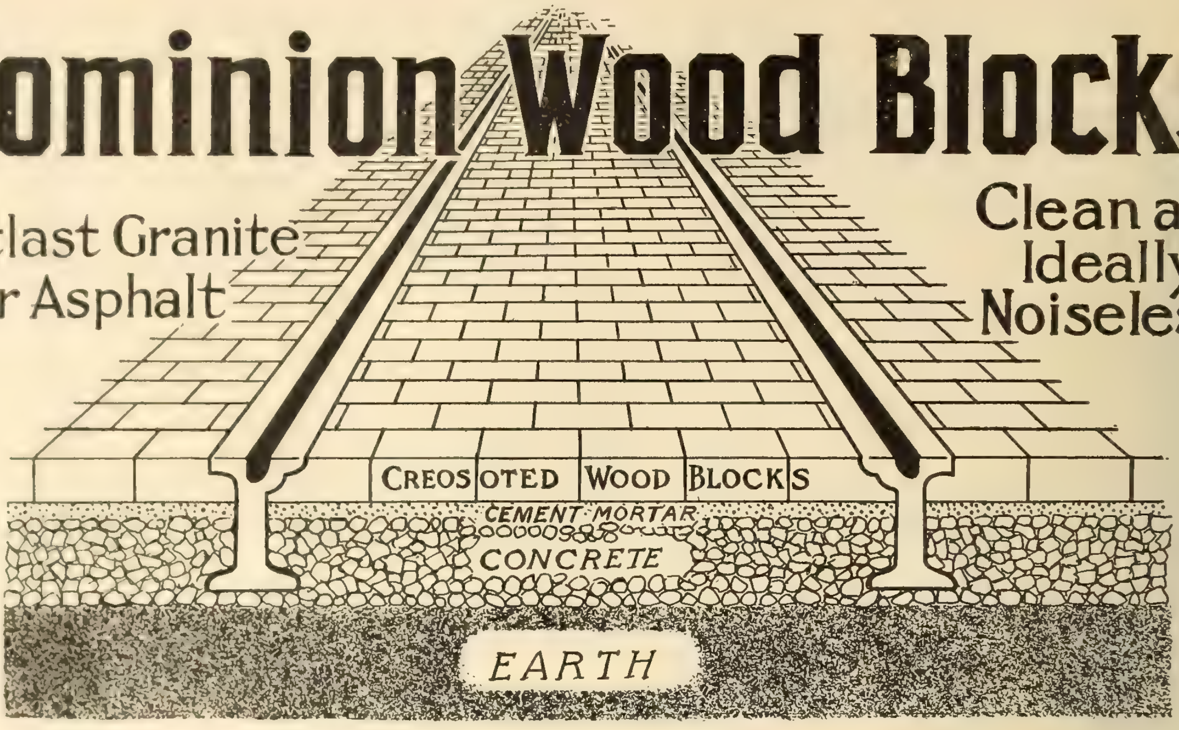


THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

Dominion Wood Blocks

Outlast Granite or Asphalt

Clean and Ideally Noiseless



Dominion Wood Blocks

make the most durable pavement for all classes of service, from the lighest wear of boulevard vehicles to the grinding of the heaviest trucking traffic. It is the one pavement that won't need the annual attention of the repair gang and will pass out of reserve in perfect condition.

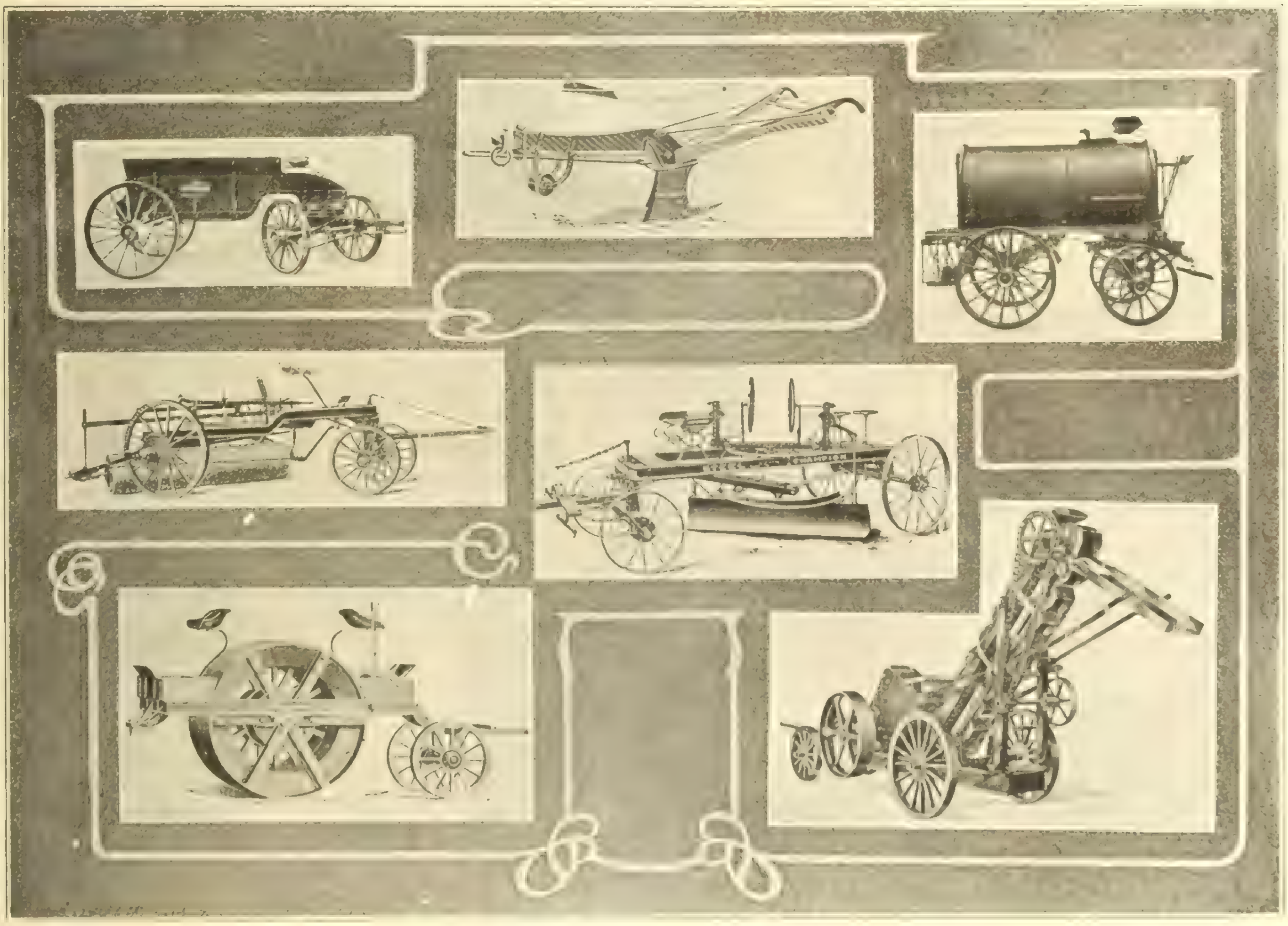
Don't put your money in a pavement that will need patching before the final payment is made on the assessment.

Dominion Carbolineum Works LIMITED
Vancouver, B.C.

"CHAMPION"

in name--"CHAMPION" in record

"CHAMPION" Road Machinery has features not found in any other make. Study this Cut



We make practically everything needed in road machinery, but every machine turned out is as carefully designed and constructed as if it was the only one built. Send for descriptive literature and prices. Standard in Canada for 20 years.

Manufactured By

The American Road Machine Company of Canada, Limited, Goderich, Ont.

Address correspondence to

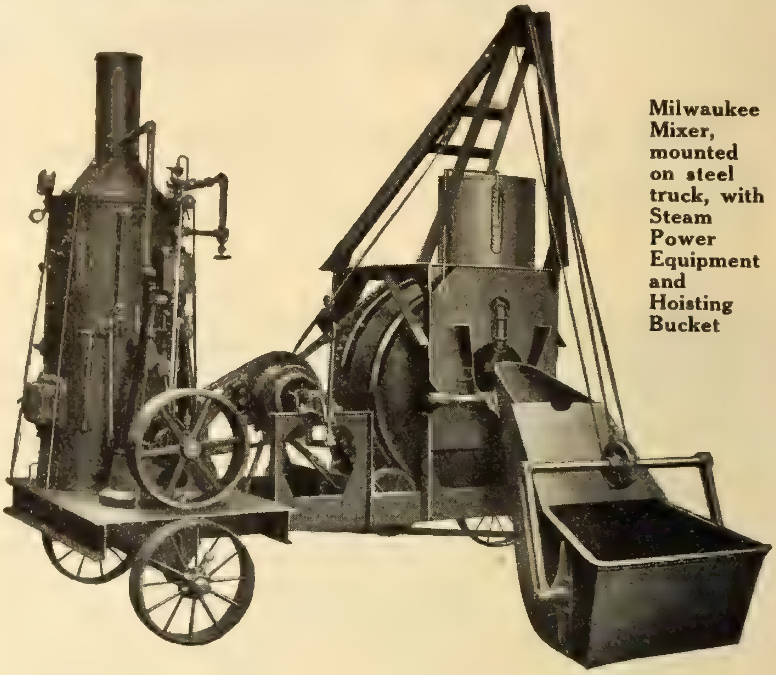
The Hamilton Machinery Company, Ltd.

Hamilton, Ont.

Sole Agents for the above Company.

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

We will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

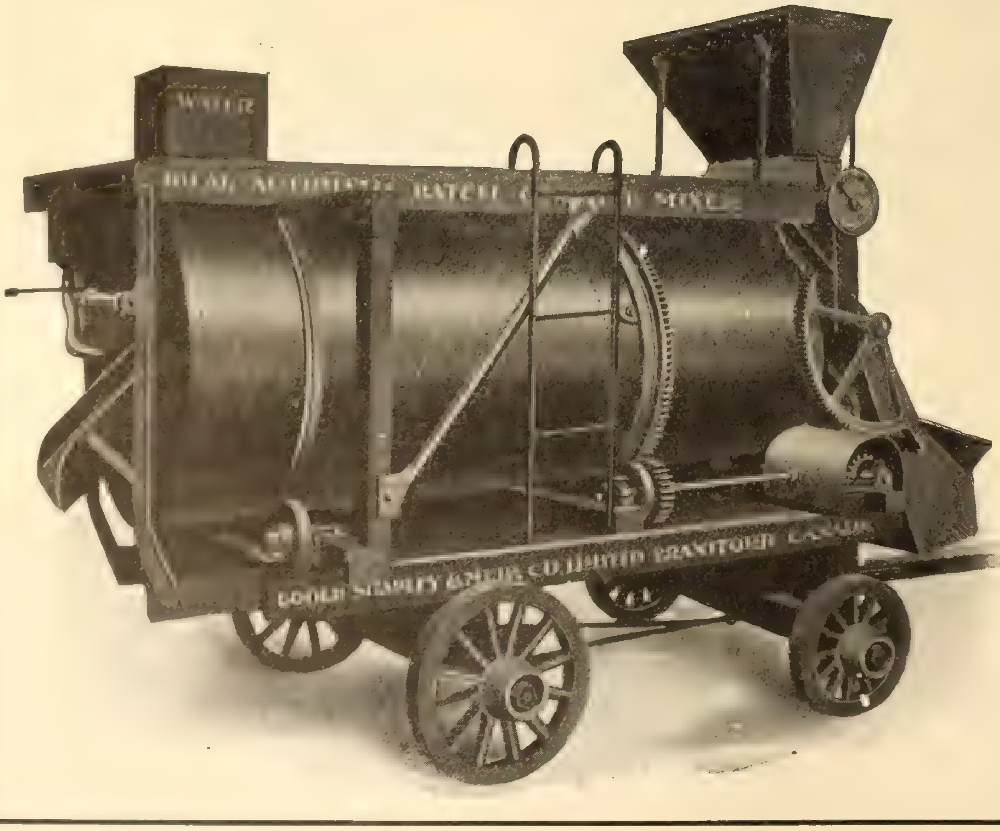
No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

Milwaukee Concrete Mixer and Machinery Co. - **Milwaukee, Wis., U. S. A.**

CANADIAN REPRESENTATIVES:

The Stuart Machinery Co., Winnipeg, Man. **C. W. Stancliffe & Co.,** Vancouver, B.C.

CONCRETE MIXERS



Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

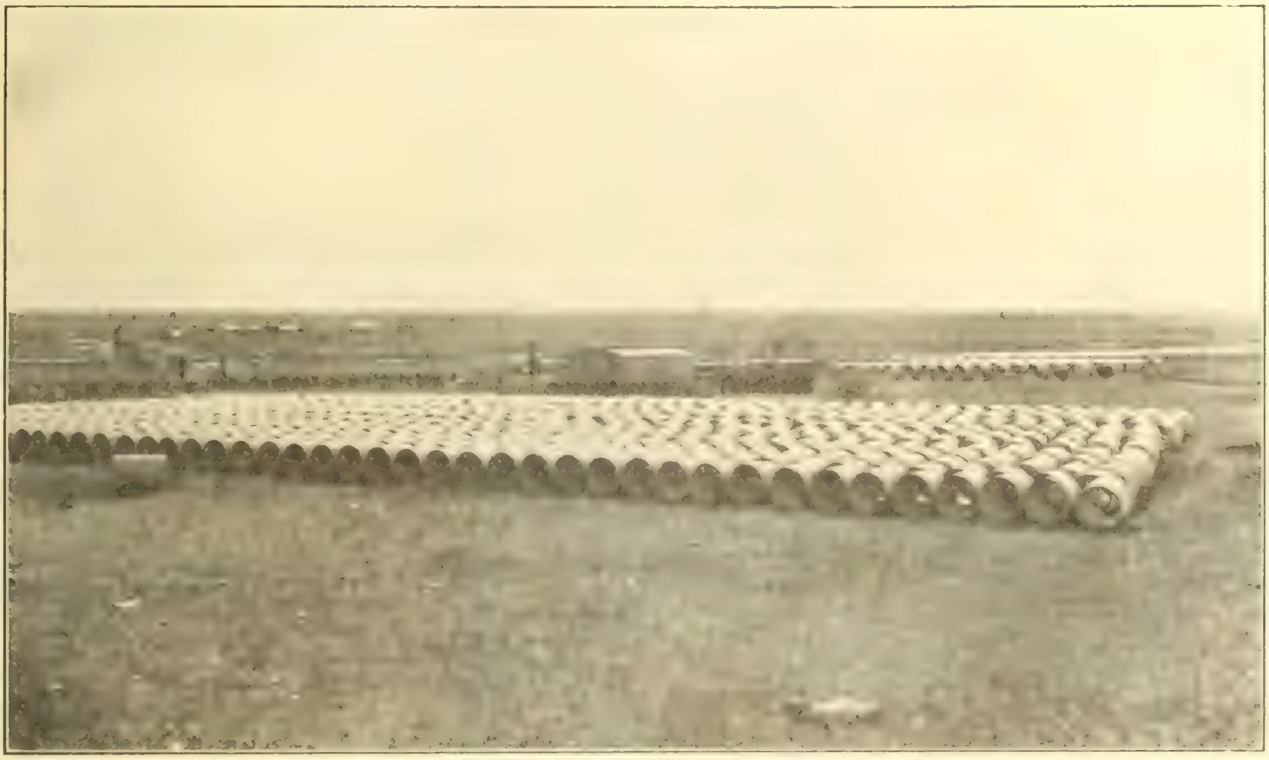
The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented



30 Inch Pipe Yard at Regina, Sask.

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

Write for Illustrated Catalog

ONTARIO AND QUEBEC
Francis Hankin & Co.
Montreal & Toronto

MANITOBA, SASKATCHEWAN AND ALBERTA
F. H. McGavin Company Limited
Winnipeg

BRITISH COLUMBIA
Pacific Lock Joint Pipe Co.
Seattle, Washington

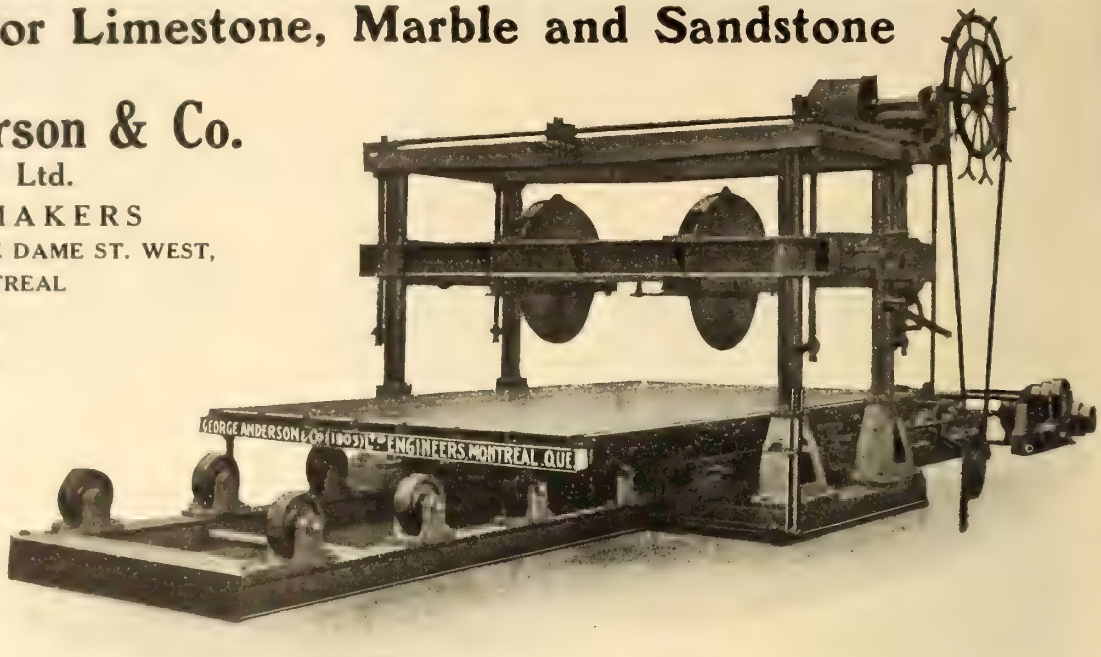
Circular Diamond Saws

For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

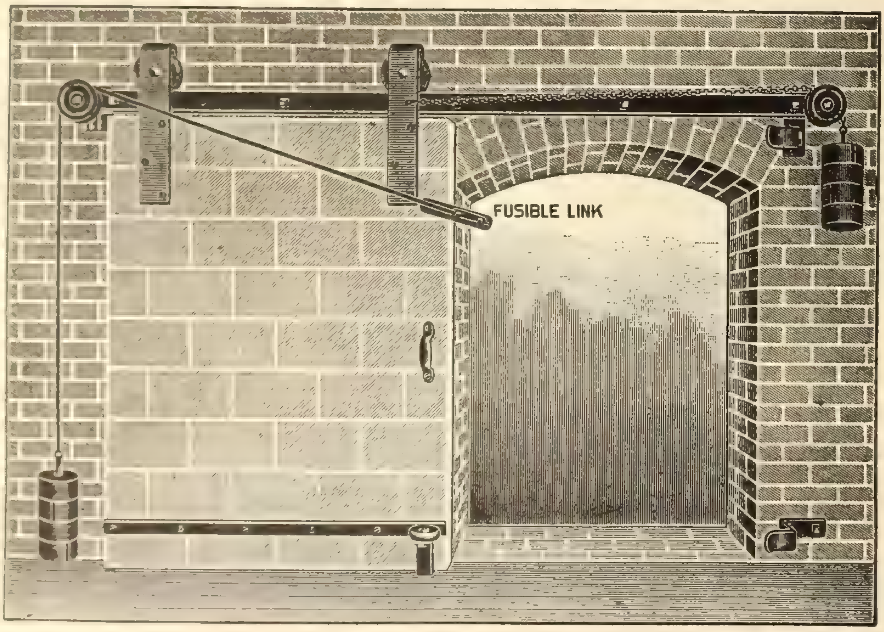
Branch Office & Works
London, England, 82 Victoria St. S. W., Newark N.J. U.S.A. 420-422 Ogden St., Montreal Works, 157 Craig St. West, Head Works, Carnoustie, Scotland

MAKERS OF
GANGS, PLANERS, MARBLE DRESSERS DERRICKS, AND ELECTRIC TRAVELING CRANES UP TO 50 TONS, QUARRY MACHINERY, GAS ENGINES AND PRODUCER PLANTS 10 H.P. TO 150 H.P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 **SINGLE AND DOUBLE TABLES**

About 50 of the above Machines at work in Canada



Fireproof Doors and Windows

We are specialists in this particular line and can solve your most difficult problems.

Estimates furnished on complete work or any part.

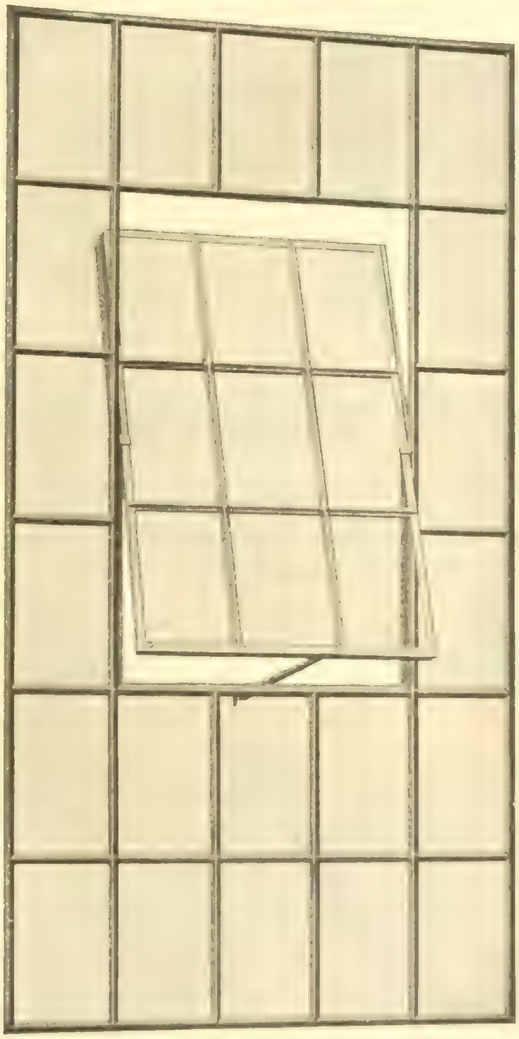
Have you our Literature?

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

STEEL AND RADIATION LIMITED

"Fenestra" Sash

Protect your
Buildings
from
Outside
Conflagrations
with
"FENESTRA"
SASH



Make Your
Windows
as
Strong
as your Walls
with
"FENESTRA"
SASH

The main object of a window in any up-to-date building is to supply a maximum amount of light, correct ventilation and protection against fire. "FENESTRA" SASH will give 25% to 30% more glass area in a given wall opening than any other type of Sash. "FENESTRA" SASH can be made to use any desired number of panes as a ventilator (illustration shows 9 panes side hung pivotted). "FENESTRA SASH" is made from solid rolled steel sections joined by the ingenious "Fenestra" joint.

STEEL AND RADIATION LIMITED

SHOW ROOMS | MONTREAL, 138 Craig St. W.
TORONTO, 92 King St. W. and
80 Adelaide St. E.

Head Office
TORONTO, ONTARIO

Stocks and
Agencies in All
Leading Cities

J. H. NEW, PRESIDENT RYLAND H. NEW, VICE-PRESIDENT

The Maximum of Quality at the Minimun of Cost

Hamilton Vitrified Salt Glazed Sewer Pipe

It is always uniform, always dependable, insuring more work, more wear and better service than is possible to obtain from substitutes. And the cost is not any greater.

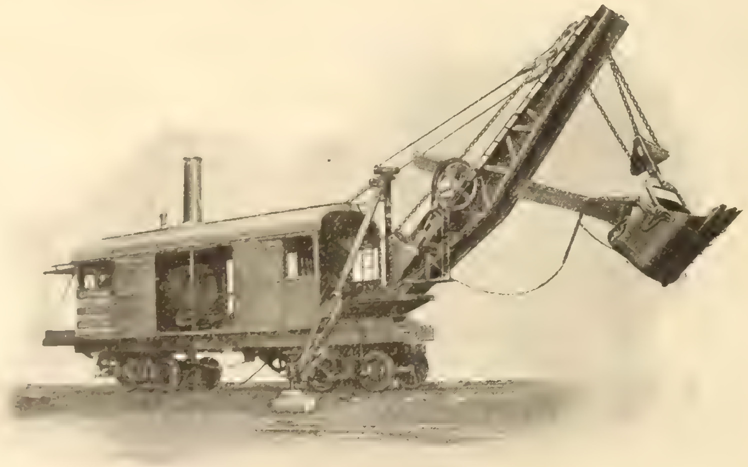
It is to your own interest to investigate our claims.

Established 1860

The Hamilton & Toronto Sewer Pipe Co. Limited

HAMILTON and TORONTO

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert Pipes

We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

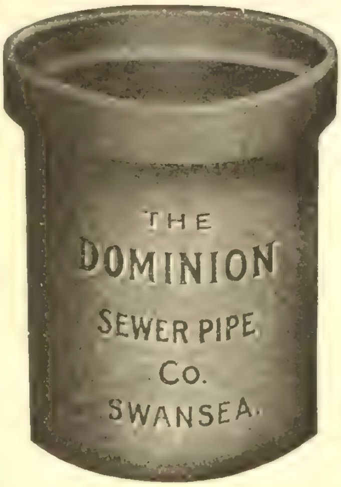
Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

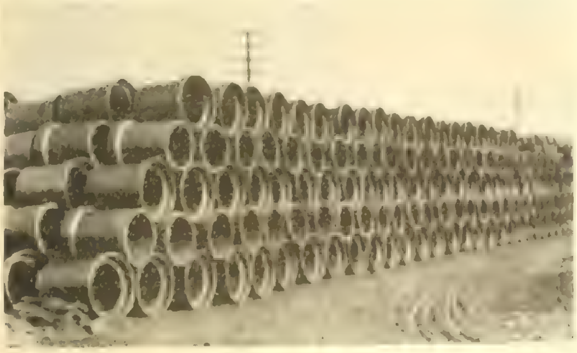
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) **Limited**
SWANSEA (near Toronto)

We are not the Largest Manufacturers

The Row of Fame is a Row of VITRIFIED PIPE



18 inch Double Strength

We Have Many Rows Like This In
MIMICO

Sizes 4 in. to 24 in. in any desired quantity

OF

SEWER PIPE

IN THE WORLD

and we have not been at it for Fifty Years either.

Look at our Pipe

and then tell us if it is necessary for us to make those boasts before we modestly admit that we hold first mortgage on the title of BEST.

ARE YOU FROM MISSOURI ?

Then we can produce to your satisfaction if you give us the opportunity.

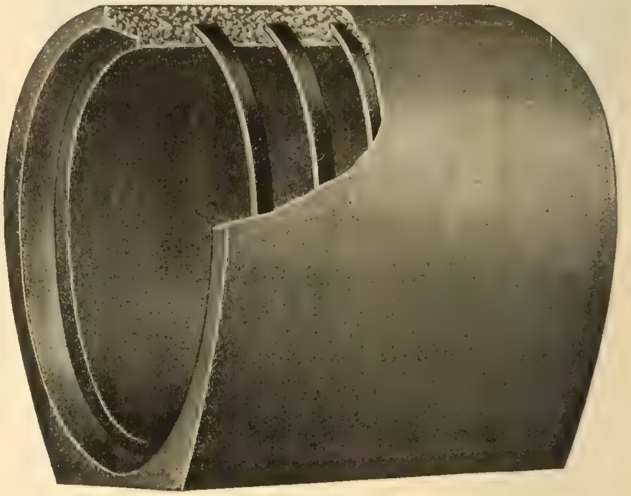
MIMICO PIPE

may be equalled, we admit, but it's more than a day's journey to find a better.

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422, Evenings Park 3888 and 3889

Railway Engineers and Contractors

Timber culverts rot, clay pipe culverts break from frost or weight, metallic culverts rust and are woefully dear, CONCRETE CULVERTS LAST FOREVER and the price is relatively low.



36" Section

The only absolutely **durable and frost-proof** culvert pipe is

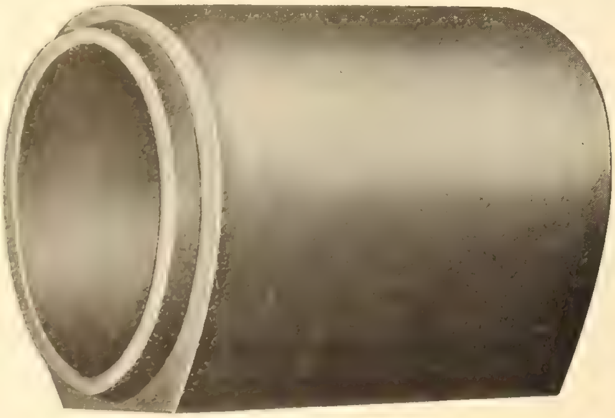
REINFORCED CONCRETE

of **first quality.** The prime requisites of first quality concrete are **good raw material, proper proportions** and **scientifically correct methods.**

We possess all these in the highest degree. Our years of experience, our facilities and our raw material enable us to make **good concrete** and make it **always good.**

Nowadays the railway engineer must get results in **permanency** as well as in other matters. The contractor too must get results if he is to stay in the game. A very important result to him is the **economy** of buying material that **holds out,** that can be handled with **facility,** and that can be procured **promptly** and at a **reasonable price.**

Don't imperil your interests by using non-durable material, or by trusting to the random hits and misses of a novice when you can buy **durable, mature,** and **guaranteed concrete pipe,** from a long-established and reputable firm.



30" Section

Mature Stock

Prompt Shipment

Quality Guaranteed

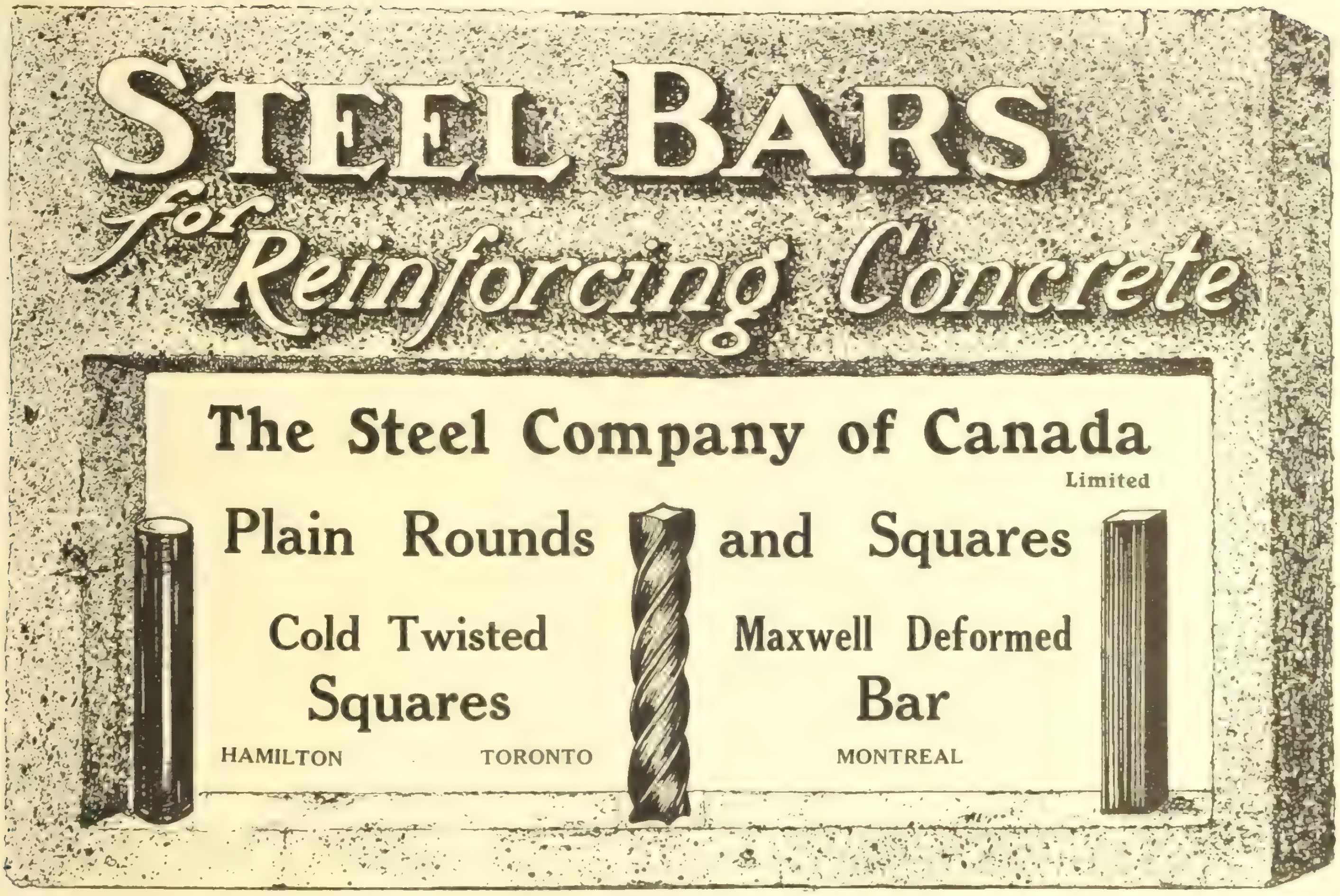
No Loss from Breakage

Low Prices

WRITE FOR CATALOGUE AND PRICES

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO



STEEL BARS *for Reinforcing Concrete*

The Steel Company of Canada
Limited

Plain Rounds and Squares

Cold Twisted Squares

Maxwell Deformed Bar

HAMILTON TORONTO MONTREAL

Make Your Buildings Rentable

By the Addition of

Gas Ranges and Water Heaters

When a tenant steps into a home, apartment or flat, and there finds a gas range and water heater set up ready for use in the kitchen, it makes a very favorable impression on him. The little extra cost is more than offset by returns from a satisfied tenant. Gas water heaters especially are not things to be carried from one house to another; besides, conditions vary—one water heater may not just suit the newer conditions. It pays to have

The Vulcan Gas Ranges and Water Heaters

installed. They keep a house or apartment in a much cleaner and healthier condition. Once installed there is then no danger of damaged walls and staircases through careless carrying in and out of tenants' own stoves. The **Vulcan** goods are also made strong. Parts can be replaced so easily. The Gas Company cleans the burners once every 3 months without extra charge (Toronto homes only). This promotes lasting satisfaction. Tenants remain, because of the increased accomodation. Let us have a talk on the matter. We can supply interesting particulars. We are at your service. Remember also, that we inspect Toronto piping contracts for you, free of charge, to insure efficiency. Act to-day. Consultations free. Prices right. Terms easy.

SEE THOSE BALLS

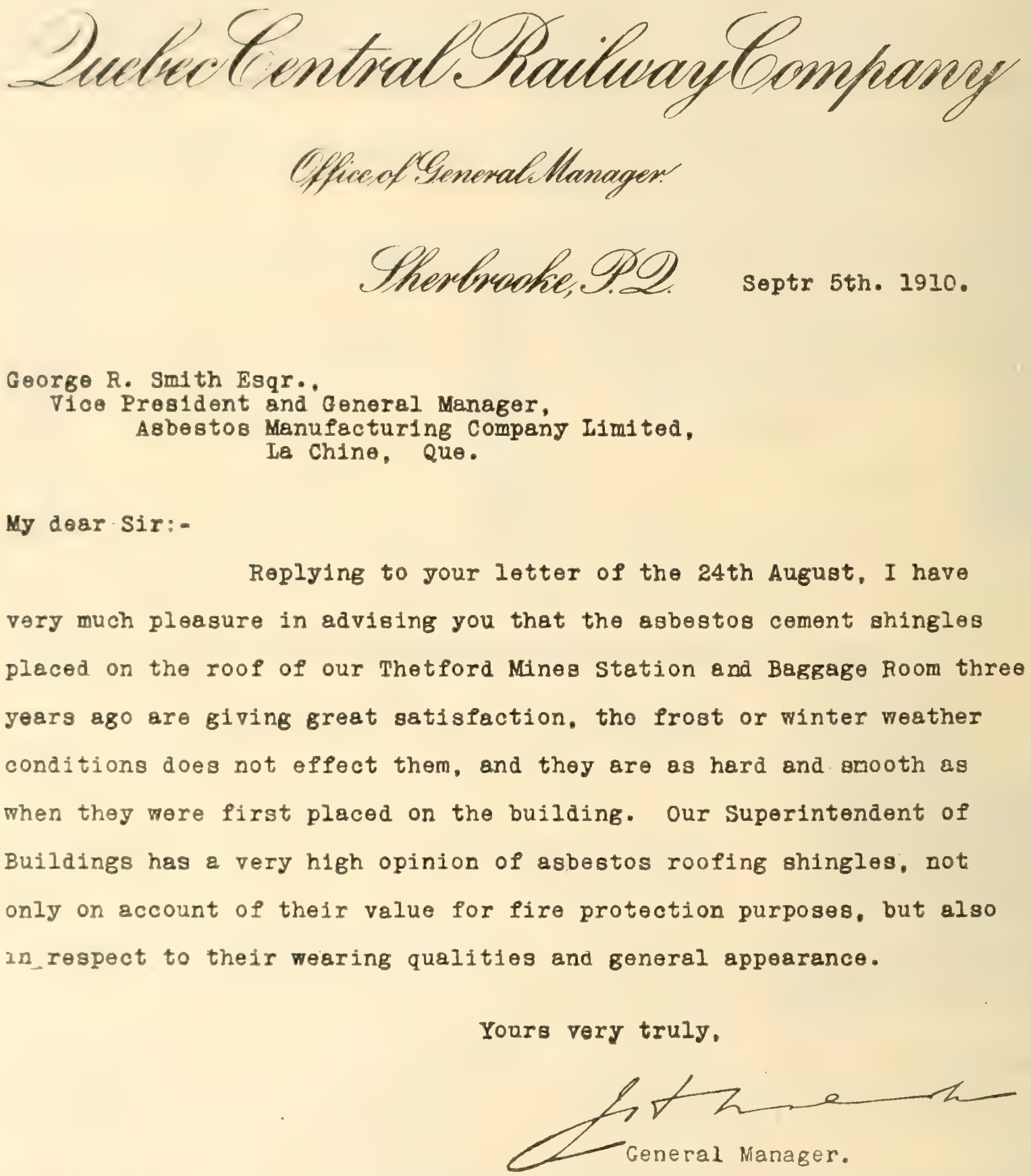
THE CONSUMERS' GAS COMPANY OF TORONTO

45 Adelaide Street E. Phone Main 1933

Asbestos Cement Shingles

WHAT USERS THINK OF THEM

LETTER No. 2



Quebec Central Railway Company

Office of General Manager

Sherbrooke, P.Q. Septr 5th. 1910.

George R. Smith Esqr.,
Vice President and General Manager,
Asbestos Manufacturing Company Limited,
La Chine, Que.

My dear Sir:-

Replying to your letter of the 24th August, I have very much pleasure in advising you that the asbestos cement shingles placed on the roof of our Thetford Mines Station and Baggage Room three years ago are giving great satisfaction, the frost or winter weather conditions does not effect them, and they are as hard and smooth as when they were first placed on the building. Our Superintendent of Buildings has a very high opinion of asbestos roofing shingles, not only on account of their value for fire protection purposes, but also in respect to their wearing qualities and general appearance.

Yours very truly,

General Manager.

FIREPROOF, WATERPROOF AND EVERLASTING

Write or Wire for Quotations

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P.Q.
Factory at Lachine, P.Q.

We manufacture Air Cell Pipe Covering, Asbestos Paper, Mill-board etc.—in fact we make everything in the Asbestos Line

Saskatoon

Porcupine

In the Western City building is active. In the New Ontario town mine equipment and machinery are in demand. In these towns and every place of importance in Canada we can, through "our man on the spot" furnish you with advance authoritative information of all BUILDING AND ENGINEERING PROJECTS.

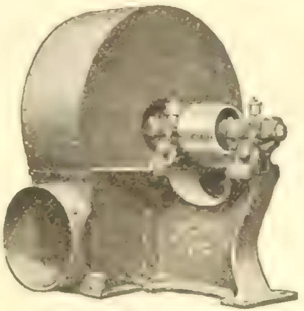
OUR SERVICE gives you timely knowledge of all sales possibilities—enabling you to get busy long before the other man knows. It enables you to select from the whole field those opportunities that promise the most profit and which you can handle to the best advantage.

MACLEAN DAILY REPORTS give a service never before attempted in Canada—a service that will increase in value to you day by day.

Ask for further details and rates.

MacLean Daily Reports Limited

220 King St. West
TORONTO ONTARIO



Sturtevant Stock Fans

Embrace such a diversity of types and sizes that nearly any ordinary conditions of fan engineering may be met by a fan shipped from stock.

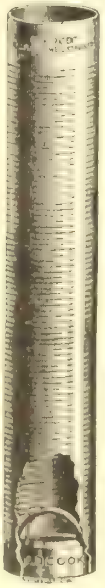
Spare parts always ready for immediate shipment.

STURTEVANT Engineers suggest and recommend apparatus to meet requirements.

ASK THEM. S63

B. F. STURTEVANT, Hyde Park, Mass.

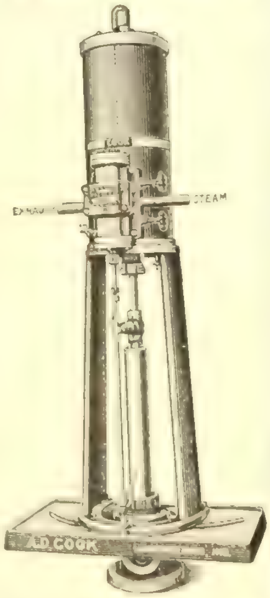
Polson Iron Works Ltd., Toronto Eadie-Douglas Ltd., Montreal



Water Supply from Deep Wells

is obtained at a minimum cost by use of our deep well pumps.

Write for Bulletin 26 explaining the use of Cook's Patent Brass Tube Well Strainer.



A. D. COOK

Lawrenceburg, Indiana, U. S. A.

Manufacturer of a Complete line of **DEEP WELL SUPPLIES** including Steam, Belt and Motor Driven **DEEP WELL PUMPS**, Wind-mill and Hand Pumps, Working Barrels and Valves, Pump Rods and Pump Rod Joints, Drill Rods and Drill Rod Joints, Drilling and Well Tools.

CATALOGUE MAILED UPON REQUEST.

TENDERS

For Roofing and Sheet Metal Work

in all parts of Canada

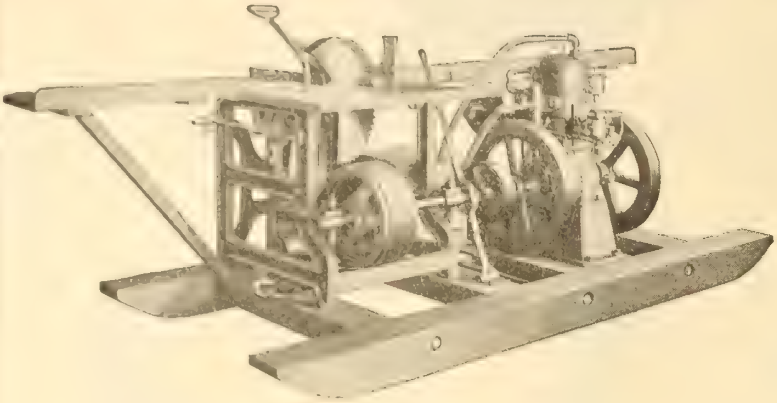
Communicate with

A. Schwoerer & Sons, Inc.

530-34 E. 80th St. New York, N.Y.

Now working in W[illegible]egina, Vancouver Montreal and Ottawa

DON'T THROW AWAY **Money** IN TIME AND LABOR



Increase your profits and business by using the latest up-to-date machinery and methods.

Oshkosh Portable Saw Rigs

Will enable you to bid lower and Beat out your competitors.

Tear Off the Coupon and Mail To-day
Before your competitor gets ahead of you

Manufactured by
Oshkosh Logging Tool Company
OSHKOSH WIS.

OSHKOSH LOGGING TOOL COMPANY
Oshkosh, Wis.

Gentlemen
Kindly send me complete catalogue and prices of the Oshkosh Portable Saw Rig

Name ....

Town ....

State ....

Transformer Building, Sydney Electric Power Co., Trenton, Ont.
ENGINEERS SMITH, KERRY & CHACE

General Contractors:

WELLS & GRAY, Limited - Toronto, Ont.

The

Tillson Company

Limited

WHOLESALE MANUFACTURERS OF

Sash, Doors, Mouldings, Frames for Doors and Windows, Columns, Interior Finish of Every Description, Porch Work, Gable Ornaments, Brackets, Head Blocks, Corner Blocks, Base Blocks, Door and Window Screens, Etc.

Millwork of all kinds

Tillsonburg,
Ontario

WHICH!

Gas-Light for $ $ $?

OR

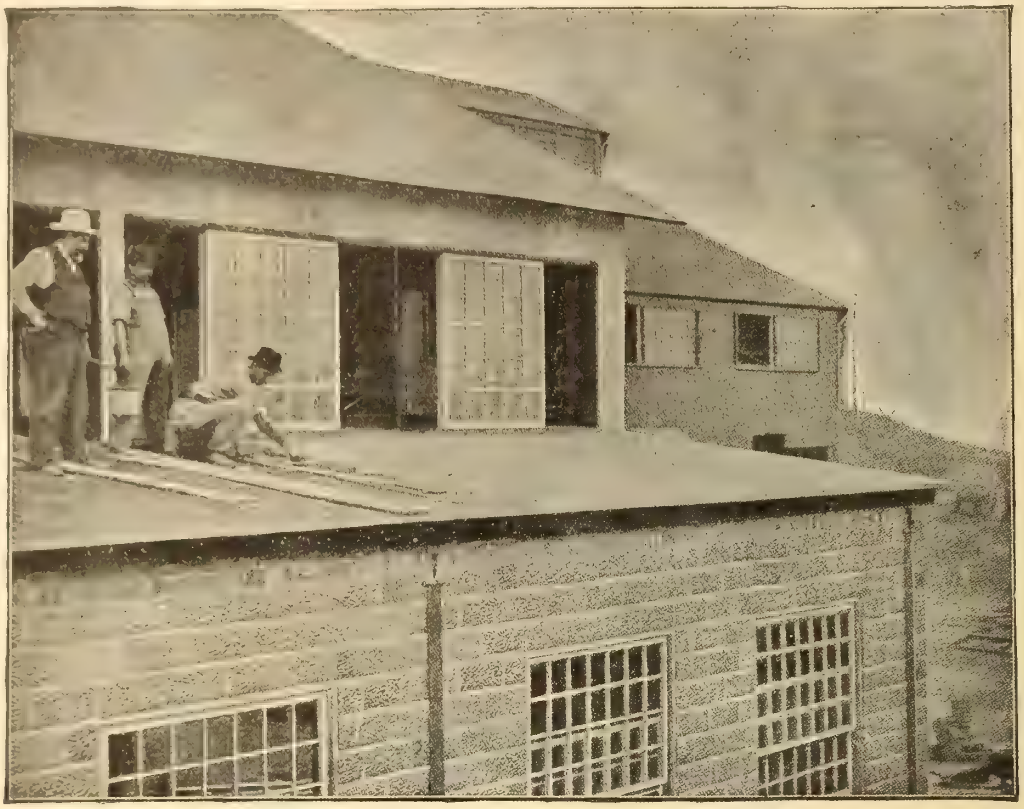
Day-Light for O O O?

By installing a system of LUXFER PRISMS in your building you can have perfectly distributed sun-light all day. There are many prisms that will admit daylight, but LUXFER PRISMS with a combination of angles will put daylight **where you want it.**

Give your client the best—LUXFER.

Luxfer-Prism Company, Limited

100 King Street West, TORONTO



The above Illustration shows the concreting of

PEDLAR FERRO-DOVETAIL

Plates, which have been laid to form a roof. The under side of these plates is plastered. This is a good example of a roof that is both fireproof and timeproof—the two qualities in which Pedlar Ferro-Dovetail Plates stand preeminent. A roof in which Ferro-Dovetail Plates are used, made of steel and cement, has not an ounce of combustible material in it. The steel plates being concreted on the upper side and plastered on the lower side, are so perfectly protected, that gases, acid fumes, atmospheric conditions or any other injurious influence cannot harm them.

Ferro-Dovetail floors show no deflection under loads far exceeding the possible requirements. There is no form of floor construction to be compared with Ferro-Dovetail Plates for factories, warehouses, freight depots, breweries, bridges, subways, tunnels, coal bunkers, public halls, etc, etc.

As Pedlar Ferro-Dovetail Plates embody an idea that is new to many architects and builders, we have published a profusely illustrated book dealing with them. This book covers the specifications, the uses to which these plates may be put, and the methods of using them. If you are interested in the subject, we would like to send it to you. On receipt of your request for bulletin No. 52, we will gladly mail you a copy **free.** Write for it.

Ferro-Dovetail Plate
Ready To Lay

Ferro-Dovetail Plate
Concreted on Top, Plastered Underneath

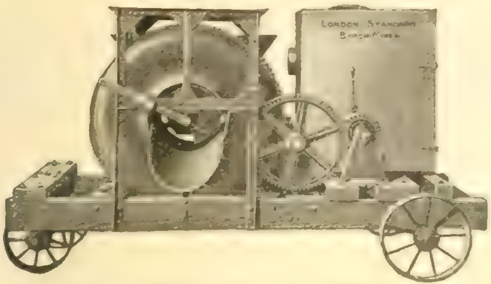
The PEDLAR PEOPLE of Oshawa

ESTABLISHED 1861

HALIFAX 16 Prince St.
LONDON 86 King St.
WINNIPEG 76 Lombard St.
MONTREAL 321-3 Craig St. W.
PORT ARTHUR 45 Cumberland St.
OTTAWA 423 Sussex St.
TORONTO 111-113 Bay St
CHATHAM 200 King St. W.
QUEBEC 127 Rue du Pont
REGINA 1901 Railway St. S
CALGARY 215 12th Ave., W.
VICTORIA 434 Kingston St.
ST. JOHN, N.B. 42-46 Prince William St.
VANCOUVER 821 Powell St
EDMONTON 547 2nd Street

Address Our Nearest Warehouse **We Want Agents In Some Sections** **Write For Details** **Mention This Paper**

A



London Standard Drum Batch Mixer No. 1
Equiped with Gasoline Engine

London Standard Batch Mixers

THE LONDON STANDARD DRUM BATCH MIXERS are made in four sizes, namely, one-third yard, one-half yard and one yard batches and are furnished with any equipment.

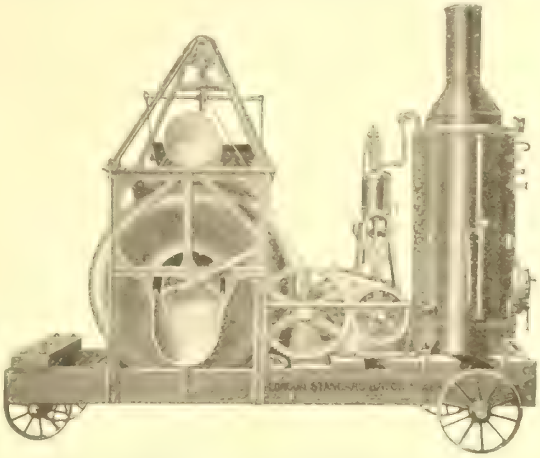
THE MANY NEW AND IMPROVED FEATURES of the London Standard Drum Batch Mixers appeal to every contractor desiring a mixer of this type. WE CAN GIVE YOU THE BEST VALUE FOR YOUR MONEY of any Firm doing business, BECAUSE we manufacture only Concrete Machinery, and on this account we can sell you a machine at very much less cost than Firms who do not manufacture their own machines but handle a concrete mixer along with other lines of goods.

We also Manufacture—

FACE-DOWN BLOCK MACHINES
CEMENT BRICK MACHINES
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES
SEWER PIPE MOLDS
ORNAMENTAL MOLDS SILO CURBS
ADJUSTABLE SILL, STEP AND WINDOW
CAP MOLDS FRICTION HOISTS

And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.



London Standard Drum Batch Mixer No. 2 equipped with Steam Engine and Loading Skip

London Concrete Machinery Co.
Limited
19 Marmora St., LONDON, CANADA

We are the Largest Manufacturers of Concrete Machinery in Canada

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.

No Wet Cellars No Damp Basements

Ceresit is a cream white paste readily dissolvable in water. This water is used instead of plain water for mixing Cement, Mortar or Concrete.

Ceresit Waterproofing Co.

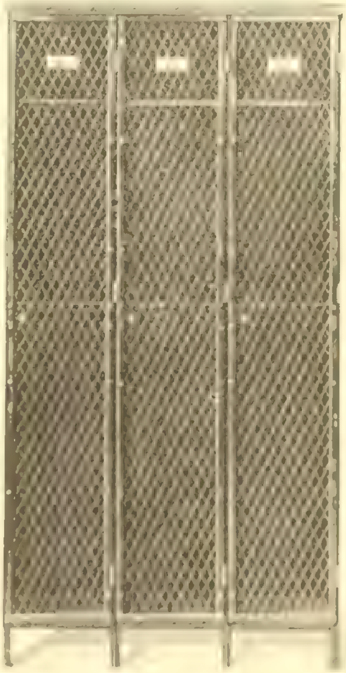
115 Adams Street, Chicago

Canadian Agents

Eadie-Douglas, Limited
Montreal, Toronto, Ottawa

[illegible]
[illegible]

GET AWAY



from the old style wooden lockers and use **Meadows' Metal Lockers.** Their construction is rigid and embodies a number of original features not found in other makes worthy of your consideration.

Send for our illustrated booklet entitled

"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co. Limited
TORONTO, CANADA

Street Railways

We are prepared to undertake the entire construction of Street Railway Systems—supply all the rolling stock from our own works.

Write us

Canada Ford Company

485 St. James Street
Montreal

Canada Life Building
Winnipeg

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

THE STANDARD Ideal
COMPANY LIMITED
GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

F. 084

Do you know of a new Barber Shop about to be fitted up? ? ? ?

If so, suggest this Handsome, Practical, Space Saving, Double Lavatory enameled all over.

It can stand free in centre of shop or against wall.

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
155 NOTRE DAME, WEST

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Published Each Wednesday by
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 May 10, 1911 No. 19

Efficiency Engineering and Organized Labor

The efficiency engineer has in numerous instances succeeded in earning his title by distinguished success in lowering manufacturing costs. It is unquestionably true that most manual operations are not conducted in such a way as to minimize the effort required for the results sought. It has time and again been shown that a little scientific study of current manual methods may result in great economy of effort and consequent economy in production.

To reduce the matter to its lowest terms, if you can show a man how to perform a given operation in 10 movements instead of 12 you will enable him to perform it more rapidly and more easily, and consequently to turn out more work with the same effort, says The Engineering Record. If the operative at a machine has to turn around to secure or deliver stock, or to lift material unnecessarily, he is by so much less efficient. It necessarily follows, as experience has proved, that study and a campaign of education resulting from that study bring effective aid in manufacturing processes. As such efforts become more common organized labor of necessity takes cognizance of them and the attitude of organized labor toward the work of the efficiency engineer is at the present time both important and altogether uncertain. No intelligent workman can object to being shown how to economize effort and work more effectively, but sooner or later he is bound to ask the categorical question whether or no he is to benefit personally by his own increased efficiency. Beyond this, if he is a union workman he is bound to consider the question of the effect of the change upon his fellows.

At the present time with efficiency engineering just under way, so to speak, organized labor is generally pursuing a waiting policy, watching the progress of events with interest, pending information that will justify a definite stand for or against the movement, and the chief matter of difficulty is that efficiency engineering is, as yet, far from being a definite proposition with respect to its effect on the labor situation. To define it is almost as difficult as to write a definite and clear-cut characterization of the New Thought movement or to explain the ethical bearing of pragmatism in a few pointed and well-considered sentences.

Organized labor is as uncertain about the bearing of the first proposition as it is about the actual meaning of the other two. In particular it is uncertain about the relation of efficiency engineering properly so-called, to the bonus system and to the still more simple operation of "speeding up" with which it is only too familiar. In a simple form its difficulty may be formulated somewhat as follows:

If by following a carefully planned scheme for economy of effort a bricklayer can double the number of bricks laid in a working day, to whom belongs the gain? And how can he distinguish the situation from one in which he is required to lay a certain number of bricks or get off the job, and from the intermediate proposition that if he will lay twice the usual number of bricks per day he will receive a more or less adequate bonus? We have nothing here to do with the effects of the distinction. What the workman wants to know is what the distinction means to him. At just this point the uncertainty of the efficiency proposition comes to the front. Again, the workman is interested in the effect of efficiency engineering on piece work. If he can learn how, without increase of effort, to turn out 200 articles a day instead of 100, will the price of piece work remain at the original figure or will it be cut in two?

These are simple economic questions, but from the workman's standpoint they are extremely pertinent. Is anybody prepared to provide them with definite answers? If so, the practical aspects of the matter are very easy to determine. But in the absence of definite information the hesitating attitude of organized labor and of labor generally is not to be wondered at. Indeed, it is hard to show the workman how in its result upon him efficiency engineering differs essentially from unscientific methods of "speeding up." That it does differ from such methods in a good many cases there is no reason to doubt. In one large works, for example, for some years past the management has fixed a price for piece work that it could properly afford to pay and has adopted the rule that thereafter the piece-work price would never be reduced unless there were furnished facilities to the workman which enabled him at least proportionately to increase his output. In this instance the management took the broad position that so long as the price for piece work was such that it could properly afford to pay, it did not in the least care how big the workman chose to make his earnings. In fact, the more money he made the more efficiency would the plant as a whole be utilized. It is quite unnecessary to state that the particular works here referred to have never had any labor troubles and that it has been increasingly prosperous and successful while this policy has been in force.

This represents one point of view regarding efficiency engineering and its results on the workman. On the other hand, in some instances of textile manufacture the piece-work price has been cut in one mill owing to increased facilities and cut in the mill next door without such increase owing to the action of more enlightened labor. Where is the line to be drawn between the attitude of the two? Morally speaking, it is sufficiently clear; physically speaking it is less easy to define.

Equally uncertain is the connection of increased efficiency with the bonus system. In one instance the management may set a price which represents fair and adequate profit to itself for the performance of an intricate example of piece-work and offer a bonus for its more efficient performance. The works next door may offer a similar bonus and use it merely to establish later a new standard of hitting the pace, with liberty to draw one's pay as the penalty of failure. All sorts of gradations exist between these two extremes and organized labor is somewhat puzzled as to what particular gradation will be represented by any particular case of efficiency engineering.

Broadly, the efficiency engineer certainly leans toward the more liberal view of the case, but can he and will he stand firmly for his view or become merely a skilled agent for discovering new ways of "speeding up?" This question stands unanswered. So far increased efficiency means all things to all men. In the long run it is quite certain that the campaign for more efficient use of human strength is bound to have a good effect. Wasted effort is unfortunate from any point of view and no one would more readily recognize this truism than the workman himself. As a practical matter, however, in its bearing on the labor question the issue seems at present uncertain, and organized labor in particular is tempted to look askance at what in the long run may bring it material benefit.

Labor Efficiency and Construction Camps

Estimating labor efficiency is and probably always will be one of the big problems contractors have to face, particularly when undertaking work of any size. It is true that certain basic figures exist as to what a man can do in a given time, but experienced contractors will agree that this is subject to considerable fluctuation and that there are periods when labor is more efficient than at other times. The remedy usually applied is that of discharging inefficient help, but in times when labor is scarce this offers no solution of the problem. The resolution is that other methods must be sought. A mistake in considering the laborer merely as a cog in the machinery seems to be pointed out by a corporation which at the present time is employing in the neighborhood of 3,000 laborers, on one of the most important construction enterprises in America to-day. This corporation has tried getting at the laborer from the human side and is achieving a measure of success in keeping the laborer for a longer period than he will ordinarily remain, and getting a standard of efficiency. In this lay the crux of the problem, for it costs the company sixteen dollars for transportation to bring the man on the job, without figuring the cost of board.

As the work is isolated and offers no opportunities for breaking the monotony by casual visits to a city, this company made the experiment of making its construction camps as attractive as possible and supplying the best possible food, commensurate with a figure that was agreed upon to be sufficient for the purpose. The keynote of the whole was cleanliness. The quarters were constructed on a sanitary basis, with plenty of ventilation, clean bunks, not too close together, provided with clean mattresses, pillows and sheets. The latter may seem a point too much for the average contractor, but it has proved a factor in raising the self-respect of the laborers. The interior of the bunkhouses are whitewashed and a janitor presides over each, employed in keeping it clean, and policing it so that there may be no breaches of the sanitary discipline. Reading and writing tables are also provided.

In the matter of food every precaution is taken to see that cleanliness prevails, both in storing it and in its preparation. A steward supervises this end of the work, and is accountable for the stores and the quality of the food. Experiments were made with various grades of flour, and when it was discovered that the best gave the best results is was adopted as a standard. The bread in this camp is as good as any obtainable. It was also discovered that when certain meat dishes were prepared by the cooks on the day previous to their use, they deteriorated and even caused sickness. This was stopped. Similar experiments were made with certain kinds of foods to find out which were best for the climate and gave best results in endurance. For the sick and indisposed a hospital has been placed in connection with each camp, provided with all first aid requirements. A competent nurse is in charge. This has been found a cure for loafing habits, as a man who reports as a sick man is treated as such.

This may seem by far too circumstantial for many and too expensive, but the organization which prevails and the cost data kept are not beyond reason. The laborers are kept in a cheerful mood and as the food is good, gives corresponding results in efficient labor returns. This fact was discovered by tests made, showing the amount of work done by the men during the afternoon hours. It is surprising what results can be achieved by raising the self-respect of the men. Some of the best foremen on this job were recruited from material which at first looked very unpromising. The large majority have accepted the sanitary methods and the attendant organization, and the others were speedily eliminated, proving that the surroundings of construction camps must be calculated on as a strong factor in figuring the efficiency of labor.—The Contractor.

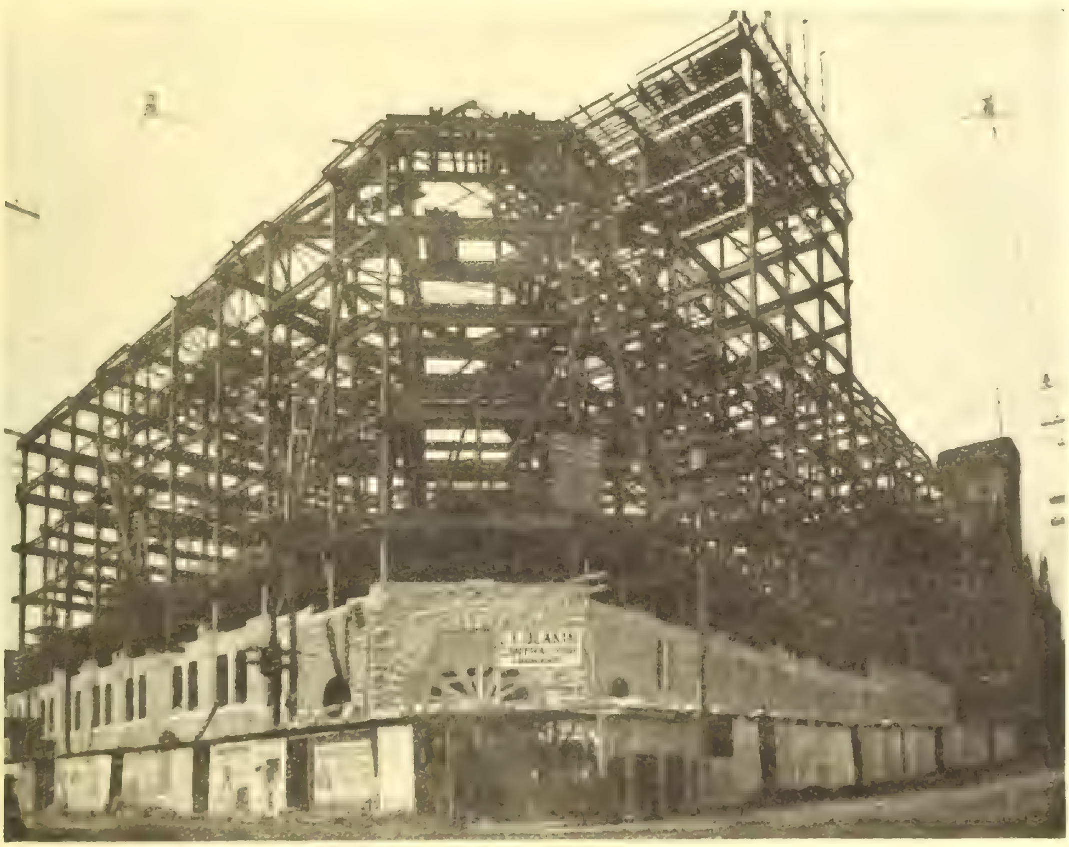
City Engineer Rust, of Toronto, is entitled to some gratitude from the younger members of the profession in the east for the constant effort he is making to protect the interests and promote the welfare of his assistants. By his recommendation for an improved salary schedule for assistant engineers he is not only improving the prospects of those under him, but he is helping to raise the status of the profession and make municipal work, if not attractive, at least a little more remunerative. Of all the thankless undertakings—where a man gives his best in exchange for ignorant criticism—commend us to the job of the city engineer. In the past the city of Toronto has lost a number of promising young men through its niggardly policy of keeping the wage bill down, and the only wonder is that it has succeeded in retaining as city engineer a man who is held in such esteem as to succeed to the presidency of one of the strongest professional organizations on the continent, i.e., the Canadian Society of Civil Engineers.

Noteworthy Building Work at Montreal

Progress Reports on the Windsor Street and Place Viger Stations — Former will be One of the Largest on the Continent

With the huge steel skeleton of the new Windsor street station of the Canadian Pacific Railway rapidly pushing its way up past the surrounding buildings into the higher atmosphere, Montrealers are beginning to wonder whether or not the building will be finished before the end of 1912, which was the date given for its completion when the work was started.

Up to date 4,800,000 tons of steel have been erected by the Dominion Bridge Company. The extensions on Windsor and St Antoine streets are practically finished as far as the superstructure is concerned, and it is probable that the steel work of the tower will be finished by the end of May.



Constructional View of the Windsor Street Station Extension, Montreal.

Good progress has also been made with the stone work of the building. The facings have been laid up as far as the floor of the second storey, the amount laid to date being over 10,000 face feet. Very little of the brick work has been laid as yet, but the concrete for the main floors has been commenced.

Shafts for three of the eleven elevators that will be installed in the building have now been dug and work has been started in connection with the digging of the artesian well which will supply the drinking water for the C. P. R. employees. This well, it is expected, will have a depth of between 900 and 1,000 feet.

The latest addition to the building operations is to consist of a boiler house, viaduct and a heavy retaining wall. These will be situated between the present main tracks on the upper level and St. Antoine street on the lower level, Mountain street on the east end. The estimated cost is about $175,000.

The retaining wall will be 225 feet long, 28 feet high and about 15 feet wide at the base; it will rest on massive rectangular concrete caissons. The wall will be given additional strength by the counterfort type of reinforced concrete and it will carry part of the baggage platform slab on top.

The concrete boiler house will extend 110 feet eastward from Moutain street and its width will be forty feet outside measurement; it will afford space for six huge boilers. A reinforced concrete coal hopper will be constructed over each boiler. Under the boiler house will be an ash tunnel, in the roof of which will be an opening from each boiler. Through these apertures the ashes will be dumped into a car conveyed to the ash hoist which will raise the refuse to the roof of the boiler house where it will be emptied into other cars running on top of the boiler house. The coal hoppers will be filled direct from cars also on the top of the boiler house.

Immediately the structure is completed three boilers of the Babcock & Wilcox type will be installed. These will be equipped with Greene travelling grate stokers with Cochrane feed water heater and Weir feed pump. Steam will be piped from the boiler house through a tunnel below the retaining wall and viaduct to the engine room directly below the concourse floor of the new station extension. The roof of the boiler house and viaduct will at the same time constitute the flooring for the new railway tracks. Three new tracks will be laid as soon as the concrete work is completed and hardened, but the design provides for expansion, admitting of four more tracks being added, the whole to be covered by a single roof, making this an up-to-date train shed.

A new feature will be adopted in the arrangement of the tracks, the idea being to have the passenger platforms and baggage platforms separate. The passenger platforms extending lengthwise of the trains will be 16 feet wide and the baggage platforms 10 feet wide. Passengers will alight always on one side of the train and baggage will be discharged on the other side, thus providing for rapid and uninterrupted traffic. The same scheme will be applied to the present track space in due time.

The chimney of the boiler house will rise to a height of 225 feet above the grade of Mountain street. A 140 foot radial brick chimney, resting on a rectangular caisson of concrete, is carried on the corner of the boiler house. The boiler house itself rests on circular concrete caissons, there being three rows of eight bents each. The boiler house, being below the track level, was designed with butresses to resist earth and train pressure. The tunnel carrying the steam from a boiler house to the station passes through the rectangular caissons which carry the retaining wall.

When the whole is completed, the Canadian Pacific Railway will have one of the largest sations on the continent. It is being built as an annex to the present Windsor street station and will be one of the highest buildings in the British Empire, rivalling even the company's new building which is to be built in Toronto.

Place Viger Station

Good progress is being made with the new Viger station, hotel alterations and re-arrangement of the terminal trackage. The accompanying photograph shows the new station in the foreground and the old station and hotel building beyond. The view is from the corner of Notre Dame and Berri streets, the latter passing down to the left and the former to the right of the picture. The new station is a two-storey structure of Scotch brick and stone on concrete foundations set on piling. It required some engineering skill to get the foundations in a satisfactory condition. It is only a couple of short blocks from the station to the river St. Lawrence. The water soaked in very fast when the excavation was being done and a good deal of pumping was necessary. The ground or track level is only fourteen feet above high water and 34 feet above the low water level, while the floor of the boiler room, which is in the sub-basement of the structure from which rises the smokestack, is only six feet above low water. The basement, however, has been made waterproof with heavy concrete. The boiler installed is a 600 h.p. Babcock & Wilcox, and it will furnish the heating for the entire terminal plant.

The Place Viger Station Contract From the corner of Notre Dame and Berri Streets.

Between the station and Berri street there will be a large court yard for the accommodation of cabs, etc. A strong retaining wall will be built to divide this court from Berri street as Berri street is a sloping thoroughfare from ten to twenty feet higher than the level of the station platform. The walls of the station are strong enough to carry additional storeys should they ever be required.

On the east side of the station is the track or yard space. Formerly the trains entered the station in a northerly direction, but under the new arrangement they enter in a westerly direction, the ends of the tracks abutting the east side of the new station. What was formerly the station in the east wing of the hotel building, is being altered for hotel purposes.

At the same time that this work is in progress a new steel and concrete viaduct is being built where Notre Dame street used to be. This will provide a roadway and foot path over head and freight sheds underneath. The whole will be fireproof.

Investigations of Flow in Brick Lined Conduits

In a paper read before the Western Society of Engineers, by John Ericson, city engineer of Chicago, the conclusion was drawn that for brick-lined conduits a value of n in Kutter's formula of 0.0130 is readily attainable. This is a coefficient due to roughness and is applicable to tunnels or sewers of ordinary sizes and velocities of flow, lined with sewer brick laid in cement mortar, if the brick is properly selected and not too warped or uneven, laid in a workmanlike manner and true to line, not disturbed by blasting and the mortar joints scraped off flush with the brick.

Under certain circumstances, especially if there has been any disturbance whatever of the brick on account of blasting, it will be found advisable and profitable to have in addition the entire interior surface of brick conduits washed with neat cement, the strokes of the brush applying the wash to be always along the geametrical axis of the conduit. By this method a coefficient of roughness, n, considerably smaller than 0.0130 should be obtained in well constructed tunnels of the sewer brick lined class.

In relation to blasting in the excavation of trenches for brick-lined conduits Mr. Ericson pointed out that if the lining is thereby at all disturbed, whether such disturbance is especially noticeable or not, it will have the effect of increasing the resistance to flow and consequently decreases the capacity of such a tunnel. The jarring of the brick work undoubtedly disturbs the mortar joints more or less, so that the bond with the brick will be broken. Slight projections and irregularities will be caused by this shaking of the brick work, and irrespective of any visible disturbance or distortion of the same, resistances to the flow of water are created.

A brick tunnel in rock should not be lined until after the completion of the entire excavation, or at least the brick lining should be kept far enough back of the face and be so protected as to be unaffected by the blasting.

In an earth tunnel, blasting should preferably not be permitted at all, and if anywhere found to be necessary care should be taken to protect the brick work from the effect of such blasting and to remedy any defects in the brick work that upon close inspection may be discovered.

Completion of the Rosenthal Building, Ottawa

The new building of A. Rosenthal & Sons on Sparks street, Ottawa, which has just been unveiled, is one of the most attractive commercial buildings in the city. It is a seven-storey building with basement and covers an area 67 feet by 100 feet deep. It is constructed of reinforced concrete, Kahn system of reinforcement. The work was started in June, 1910, and was delayed considerably on account of the large amount of rock excavation. For the basement and sub-basement it was necessary to go down 17 feet; in all, about 2,000 cubic feet of limestone rock was taken out. An arch type of floor construction was used, thus obviating the deep girder and floor slabs. The ground floor, basement and half of the second floor are used by A. Rosenthal & Sons, for their own business, the main floor being devoted to jewellery with the cut glass and art department in the basement. The workroom and manufacturing department is in the rear of the second floor. The remainder of the building is devoted to offices.

Two elevators supplied by the Otis-Fensom Elevator Company connect with all the floors and the basement. On the main floor there is a large burglar-proof vault of concrete, reinforced with street car rails. About 30 tons of rails were used. The vault was provided by J. & J. Taylor.

All the stairs are of concrete, with marble treads and risers. The main entrance lobby is panelled to a height of eight feet with large slabs of Mississquoi marble. The large columns in the store are finished in slabs of French Bresche Violet marble. The interior fixtures, which were supplied by the Library Bureau, are of mahogany on the main floor, with verde antique marble base. The store floor is of marble mosaic. The exterior of the building is of semi-glazed terra cotta manufactured by the Doulton Company, of England.

The New Rosenthal Building, at Ottawa.

All the ornamental iron work in the store front and throughout the building was furnished by the Canada Foundry Company.

The building was designed by Mr. A. Le B. Weeks, architect, Ottawa; C. E. Deakin, of Montreal, had the general contract. The reinforced concrete work was done by Jago & Company, of Montreal; the marble work by A. K. Mills & Son, of Ottawa; the electrical work by W. J. O'Leary & Company, of Montreal; the mill work by the W. C. Edwards Company, and the plumbing and heating by McKinley & Northwood, of Ottawa.

The Hypochlorite of Lime Treatment

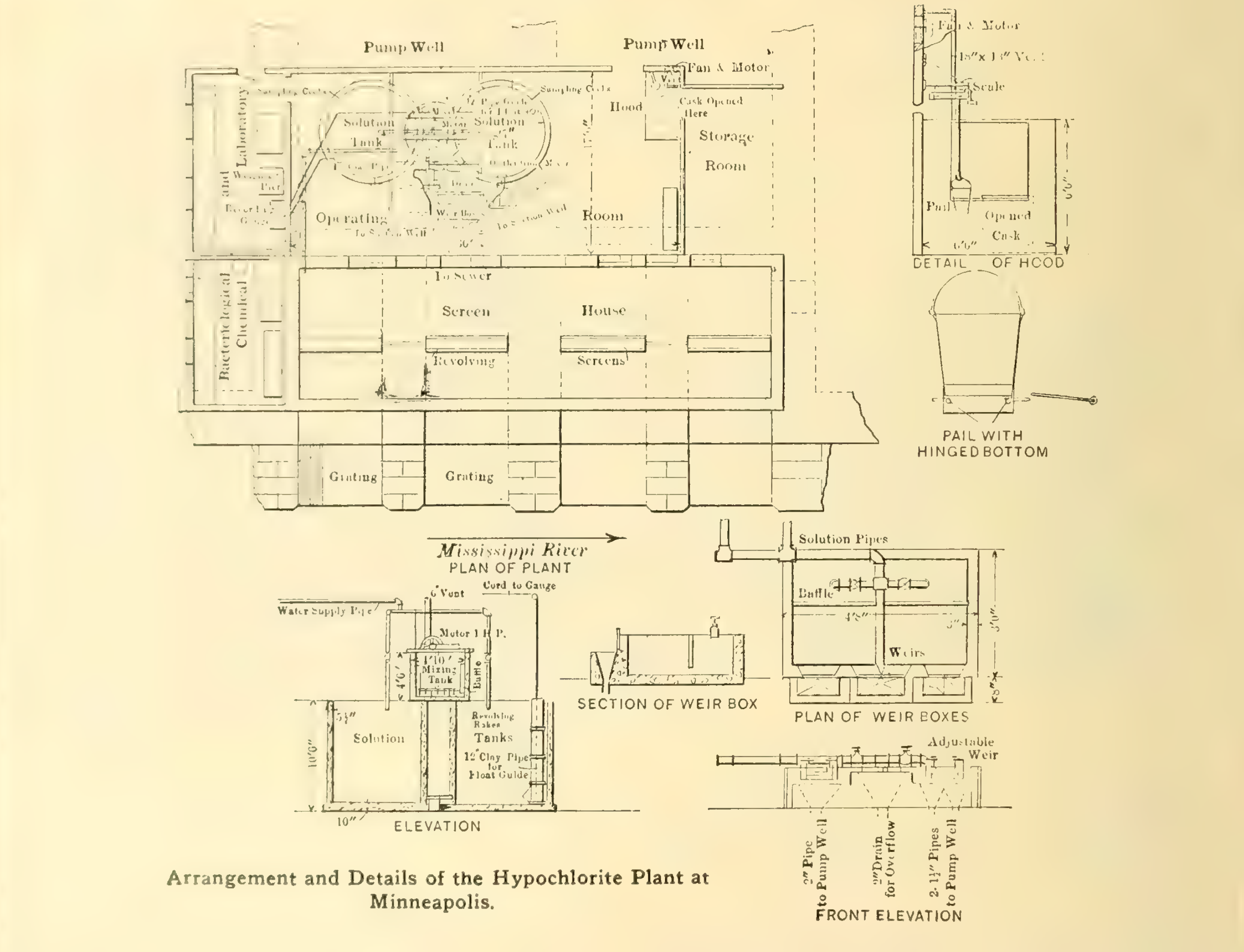
Difficulties of Operation Encountered at the Minneapolis Plant and the Protective Devices Adopted—Gauging Flow of Solution—Periodical Tests of Water

About one year has elapsed since the hypochlorite of lime treatment plant at the Minneapolis waterworks was installed. During this time some of the early difficulties of operation have been eliminated.

As the attendants operating the original temporary plant were frequently sick, means were adopetd in the permanent installation to handle the chemical under hoods. As no measuring device which will continue to give constant ratings is available, hand-adjusted weirs are used, reliance being placed on hourly readings of the drop in the solution tanks.

The plant has a capacity sufficient to treat from 20,000,000 to 30,000,000 gal. per 24 hours. The chemical is applied to the raw Mississippi River water entering the pump wells. As it is the intention to use hypochlorite of lime treatment in connection with the filters now in course of construction, the permanently installed plant consists of reinforced concrete tanks, weir boxes and discharging funnels connected up with galvanized iron pipe. The present use of hypochlorite of lime was an emergency measure brought about by an epidemic of typhoid fever caused by the infection of the water supply from the cities on the river above, where that disease was prevalent. The death rate being alarming, treatment was ordered by the city council, and through the co-operative efforts of the engineering and health departments, the temporary plant was constructed and put into operation eight days after authorization.

By introducing the chemical at the pump wells, a thorough mixing is obtained and a long contact period for reaction is provided by the passage of the water through the pumps to the reservoirs 3 miles away, whence it flows by gravity to the city. The original plant was built of wooden tanks and wooden measuring devices, thereby gaining several weeks' time as well as giving the designers valuable experience when it became necessary to replace the temporary appar-



Arrangement and Details of the Hypochlorite Plant at Minneapolis.

atus. The permanent tanks and measuring devices are built of concrete, and measures have been taken to avoid the disagreeable odor in handling the hypochlorite, to resist its corrosive action and also to measure the solution applied to the water. For the sake of economy, the old tanks were used as outside forms for the new concrete tanks, which have walls 5½-in. thick and are reinforced with No. 11, rectangular mesh, wire fabric.

Suitable charges of hypochlorite are introduced into the 450-gal. mixing tank and dissolved by revolving rakes on a vertical shaft. A 1-h.p. motor drives the shaft by worm gear. Baffles on the sides of the tank prevent the water from swirling in a mass. The ceive a specially designed pail with a collapsible bottom. The fumes rising from the dumping of the bucket and the churning solution escape through a 6-in. vent in the cover, passing up through the roof.

The solution is run from the mixer alternately to two 4,500-gal. feed tanks. Each tankful is tested, samples being taken both from the top and bottom, for available chlorine. When the proper strength is obtained by dilution, the solution is ready for use. Each tank is provided with a float rising and falling in a 12-in. clay pipe which serves as a guide. These floats communicate with recording gauges in the laboratory, which make a record of the service and check the work of the attendant. A dial gauge in the laboratory, on which the level of the solution may be seen, is read each hour by the attendant and the record kept in a book provided for the purpose.

Gauging of the flow is effected by passing the solution through two weir boxes, each supplying the pump well of a 15,000,000-gal. pump. The boxes are provided with adjustable weirs, which are reversely calibrated by the fall of the liquid in the solution tank per unit of time. This was found to be the only absolute method of accurately measuring the solution, owing to its corrosive or encrusting effect on weirs, or orifices varying the size of such openings which was sufficient to vary the size and render the work inaccurate.

The head on the weirs is kept constant by an overflow from the box, and the level is obtained by the operator of the valves controlling the solution. These valves are adjusted by an attendant. The discharging sheet from one of the weirs is divided by a knife-edge partition between the funnels, as shown in the drawing. Each portion of this discharge corresponds to the volume of water passing on each side of a dividing wall in the pump well. The weirs can be seen at all times, and the accretions which form can be filed off as soon as they affect the discharge. As the actual quantity discharged is checked each hour, the calibration is used simply as an arbitrary scale.

Besides eliminating the fumes of the mixer, precautions have also been taken to remove the fumes while opening the casks and weighing out charges. For this purpose a hood of matched lumber was built, of sufficient size to hold the largest size cask. The hood has a rectangular vent 18 in. x 18 in. at the top of which is a 24-in. motor-driven fan. When the dry material is being handled the fan is put in motion, thus driving the dust away from the operator. The charging pail is hung in the hood on a rod connected to a scale beam which is above and away from the fumes. The improvements enumerated have rendered the handling of the hypochlorite free from injurious effects upon the attendants, so that no time is lost on account of their being away on sick leave from this cause.

Four tests are made of the water daily—one of the river water, another after leaving the pumps, a third at the reservoir inlet, and a fourth at the tap in the bacteriological laboratory. In addition to these, periodical tests are made on water taken from various taps in the city. The colon bacillus has never been found in treated water since the initial installation, although it is always present in the river water. Two chemists and three attendants working in 8-hour shifts are in charge of the operation of the plant, which is fully equipped with a chemical and bacteriological laboratory. Owing to its remoteness from the city, the laboratory has its own gas-generating plant.

Experience has shown that to a certain extent the amount of chemical required is proportional to the fineness of the suspended matter, measured microscopically, rather than the amount of the turbidity. It has also been found that in summer harmless bacteria grow in the water, but in winter the bacteria counts continue to diminish from the pumps to the consumer, from which it would seem that in regulating the required quantity of chemical, more reliance should be placed on the removal of bacteria indicative of contamination, and less on the total number of bacteria. The following table gives a summary of the operating data of the plant for 1910:

OPERATING DATA OF MINNEAPOLIS HYPOCHLORITE OF LIME PLANT FOR 1910.

Month.	Av. Turbidity Parts Per 1,000,000 Raw.	Av. Daily Bacteria Per Cu. Cm. Raw.	Treated.	B. Coli. Raw.	Treated.	Av. Hypo. Used Parts Per 1,000,000
March	10	1,100	365	+	0	1.68
April	10	8,000	1,200	+	0	2.01
May	[illegible]	7,300	320	+	0	3.04
June	10	6,000	274	+	0	2.94
July	15	6,000	1,090	+	0	2.45
August	[illegible]	5,800	213	+	0	2.37
Sept.	5	1,070	230	+	0	2.30
October ...	5	1,360	299	+	0	2.28
Nov.	5	250	7	+	0	2 23
Dec.	3	.450	8	+	0	1.54

The plant was constructed under the supervision of Mr. J. Arthur Jensen, engineer of the waterworks. The laboratory and sanitary work is under the supervision of Dr. Frank J. Corbett, city bacteriologist, whose study in connection with the operation of the plant has resulted in the development of the protective devices described.

Labor on Railway Construction

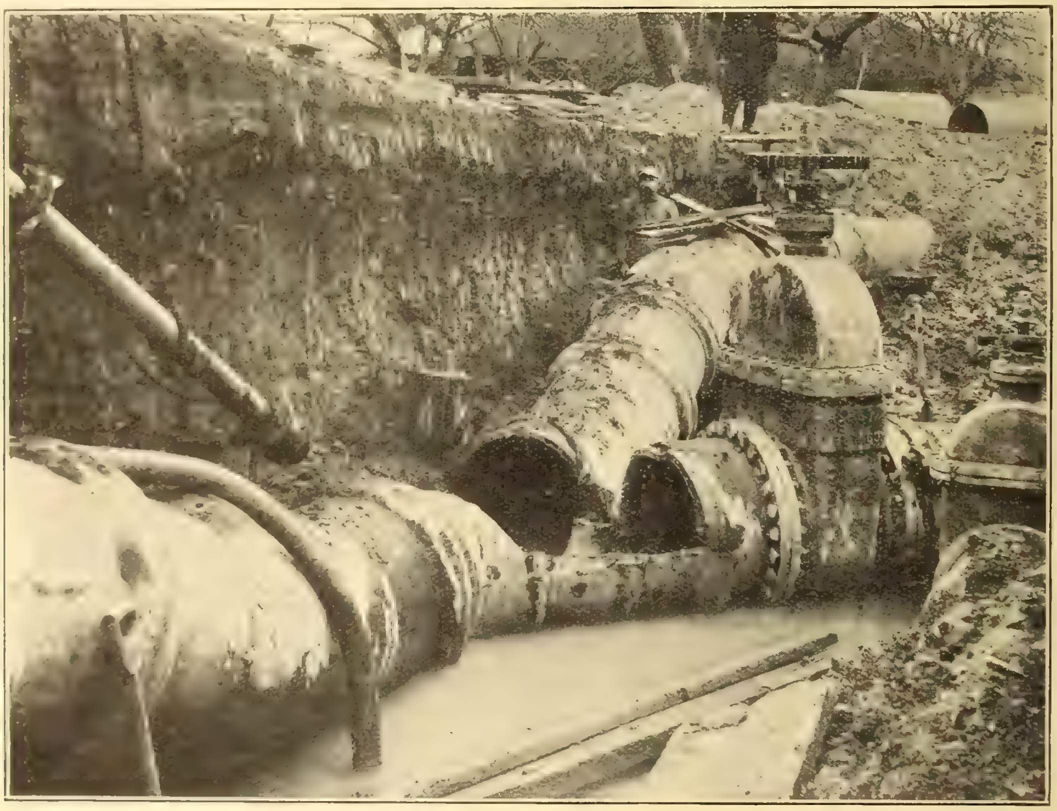
The Dominion immigration regulations, providing that aliens entering Canada must come direct from the countries of their birth or naturalization, will be partially suspended, it is stated, until September 30 next, for the purpose of affording railroad contractors the opportunity to secure sufficient men for the vast amount of railway construction projected for the present season. The precise regulation acted is Privy Council order, No. 920. It was suspended on July 14, 1910, for three months as the contractors were unable to secure sufficient labor. In connection with the suspension of the order, it is added, however, that the applicants for admission must produce evidence to show that they are going to railway construction jobs. Laborers from the south of Europe will not be allowed to enter Canada, the change applying only to those from Northern Europe. Orientals are not affected.

Municipal Engineering at Hamilton, Ont.

Interesting Details from the Annual Report of City Engineer Macallum — Costs of Sewers — Supplementary Notes on Failure of Casting

Considerable activity is reflected in the annual report of Mr. A. F. Macallum, city engineer of Hamilton, Ont., which contains a number of items of interest in regard to the work accomplished during 1910.

The present population of the city is 73,538; the acreage is 6,090, and the assessment value is $48,538,015. Mr. John R. Heddle is assistant city engineer; J. Albert Anstey is overseer of waterworks construction; James McFarlane, chief engineer Beach Pumping Station; Campbell Leckie, chief engineer Ferguson Avenue sewage disposal station; John Hodgson, chief engineer Wentworth street sewage disposal station; James Boyd, engineer high level pumping station.



Failure of 30-inch Y at Beach Pumping Station

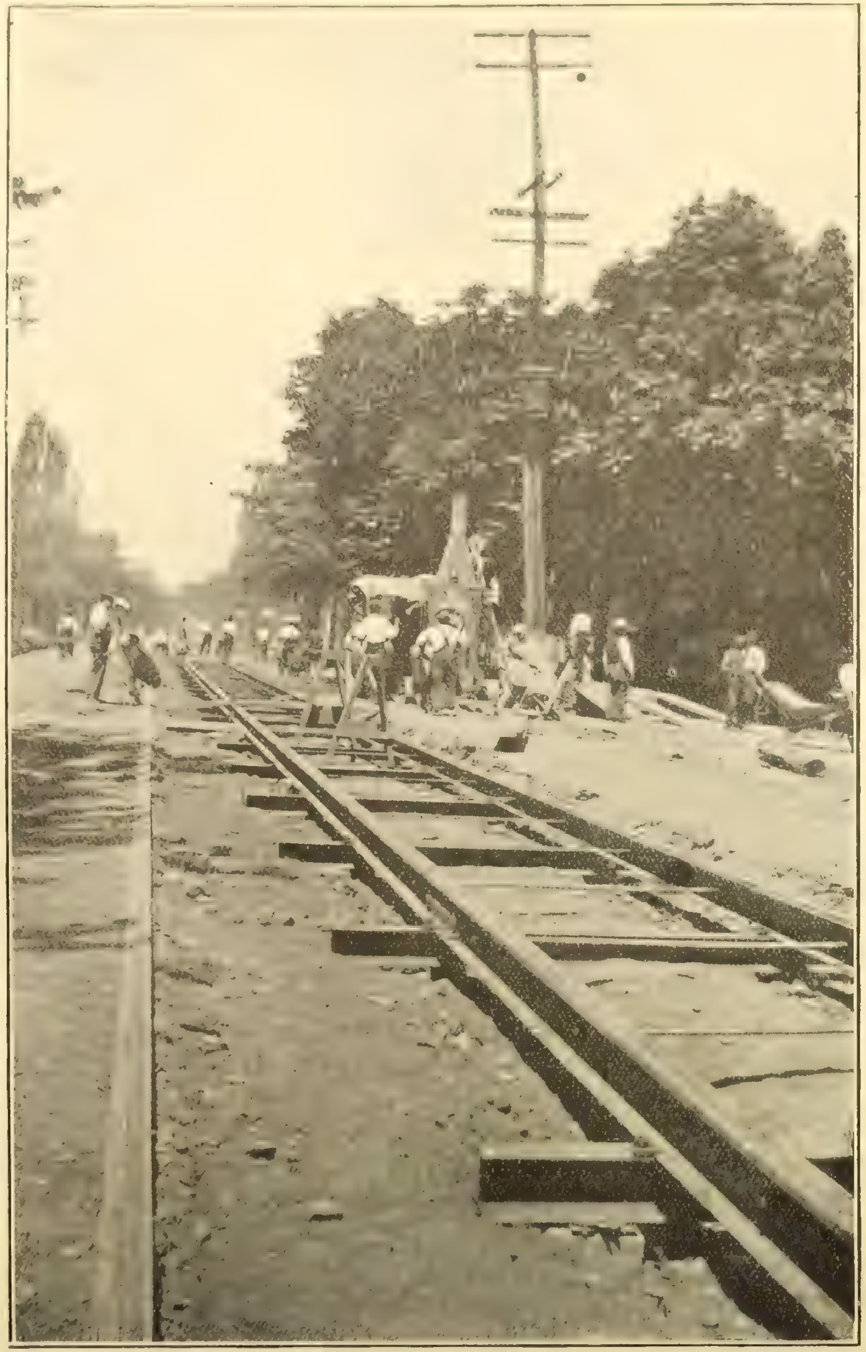
Dealing with the work of the waterworks department the report states that the two electrically-driven turbine pumps, each having a capacity of six million gallons a day, were installed in the new building at the Beach pumping station upon December 21st last. New valves were placed in the wells and a 30-inch main laid to and intersecting the 18-inch, 20-inch and 30-inch pipes connecting with the steam pumps, with necessary cut-off valves. Three more valves have yet to be placed on conduits from the settling basins. The capacity of the present reservoir is but two and a half million gallons, sufficient only for about a three hours' supply during an average day in the summer season, and Mr. Macallum recommends the construction of a larger reservoir. He also advises that it will be necessary to extend one of the intake pipes at least 1,000 feet from the shore line of the lake. At present it extends only 200 feet, which distance is insufficient to clear the heavy ground ice formation upon the lake shore during the winter months, which practically puts these pipes out of commission during that period.

On account of the recent annexation of the district east of Sherman avenue, it was necessary to lay out a complete drainage system. Trunk sewers were constructed at Lottridge, Trolley and Barton streets. These large concrete sewers will all discharge into the new east end disposal works. At these works a pumping house was built and two electrically-driven centrifugal pumps were installed to pump the sewage to the level of the sedimentation tanks. This plant is now complete and ready for electric power.

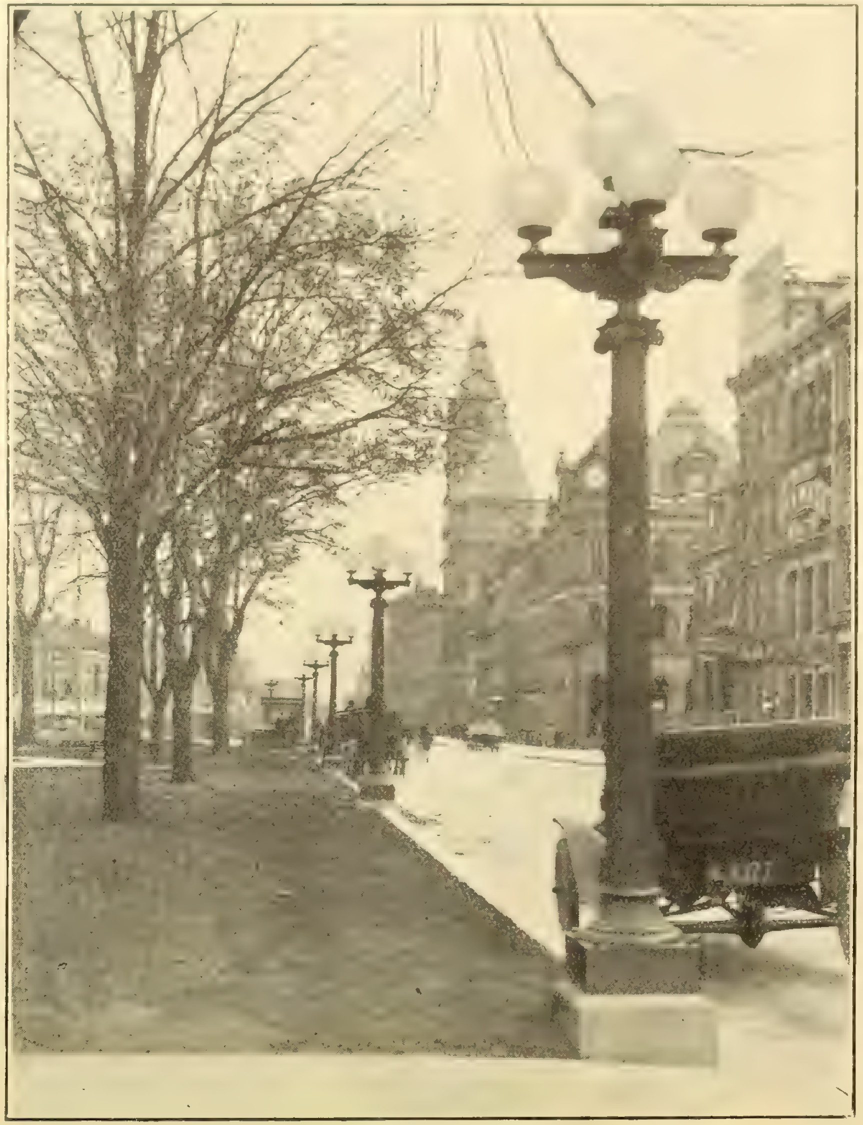
A considerable amount of asphaltum and macadam paving was done during the year. Stone from the city's own quarry was used but it was not found of sufficient toughness for the wearing surface of the macadam roads. Where street railway tracks were relaid, creosoted wooden blocks were placed between rails and for one foot outside outer rails. On the heavy grade on King street, between Hess and Ray

Electric Light Standards, Gore Park, Hamilton, at night

Grooved Wood Block Pavement, James Street South, Hamilton



Street Railway Construction, King Street West, Hamilton



Electric Light Standards, Gore Park, Hamilton streets, grooved wooden blocks were laid across the full width of the driveway instead of asphalt, giving a better foothold for the horses.

The following costs of sewers are abstracted from the report. The sizes vary from 9 to 30 inches and the cost per foot from 90 cents to $7.91.

L'gth in feet	Character	Total Cost	Cost per ft	Average Depth
230	12 in. Pipe	$ 193 73	$0 84	8 ft 0 in
965	12 "	Included in Base Line		10 " 4 "
1400	12, 18, 24 in. Pipe	3,341 87	2 39	12 " 2
467	12 in. Pipe	Not completed in 1910		11 6 "
325	12 "	293 73	90	10 " 0 "
1409	24 "	Including whole system, 10,228.75	2 23	11 " 0
260	12 "	344 92	1 33	12 2
1218	18 & 15 "	2,787 85	2 29	11 6
1749	12 "	1,682 07	96	11 " 0 "
324	12 "	503 46	1 55	9 " 8 "
447	12 "	826 16	1 85	10
515	9 "	569 48	1 10	9 0
710	12 "	809 98	1 14	8 " 9
1668	12, 15, 18 in. Pipe	Not completed in 1910		
664	12 in. Pipe	600 03	90	10 " 6
2948	30, 24, 15 in. Pipe	Not completed in 1910		
685	18 in. Pipe	" "		
965	9 "	Included in Base Line		9 0
660	12 "	921 96	1 40	11 " 0
70	24	438 96	6 27	17 8
1823	30 in Concrete	14,136 70	$7 91	14 ft. 6 in
349	12 in. Pipe	305 77	88	10 " 8
350	12 "	Included with St. Clair Ave.		10 " 6
1910	2 ft. 3 in. egg shape concrete 24 in. Pipe	6,605 08	3 45	13 0
430	12 in. Pipe	643 49	1 50	10 6
145	9	87 74	60	12 " 0 "
245	9	272 09	1 11	8 " 6
1251	15	Included in Base Line		10 0
992	9	1,105 45	1 12	9 " 0 "
593	12 & 9	And Main St., 843,42	90	10 " 0
382	12	347 98	91	9 0 "
402	12	503 17	1 25	10 " 6
1307	12	Not completed in 1910		
315	12 "	258 35	75	10 " 7 "
2923	4 ft. 0 in. wall sided 4 ft. 6 in. circular	Not completed in 1910		15 " 8
1022	20 in. Pipe	1,325 53	1 30	9 9
592	12 "	728 27	1 21	10 " 0 "
264	18 "	460 18	1 74	9 " 0 "
375	12	272 72	73	9 0

In connection with the failure of the casting shown in one of the cuts reproduced herewith we are indebted to City Engineer Macallum for the following information:

"The casting is a 30-in. Y connection between one of the city mains and the new electric pump pipe. This casting was designed according to the usual standard for heavy pressure, but upon turning the pipe into use and after about one hour's pumping at 120 lbs. pressure, the top of the casting blew off, as shown. The top half of the casting along the greatest diameter, in both cases, sheared off as if it had been cut. A new casting was made and the thickness of the shell was increased, also the thickness of the reinforcing ribs; and to strengthen the comparatively flat faces across the junction of the two branches, three ¾-in. bolts were run through. This new casting has stood the pressure since. The failure of the first casting was not due to any imperfections or flaws in it, so far as could be ascertained."

Road Improvement in Nova Scotia

Nova Scotia possesses, according to official figures, some 18,000 miles of highways, divided into road districts and under the superintendence of the road commissioner of the province. Of this total it is estimated that 10,000 miles are fairly good road for drving and automobiling, and every year many miles of graveled road are being added. During the year ended September 30, 1910, work to the amount of $163,512, was done, and other work undertaken or mapped out, calling for an additional expenditure of $21,951. This aggregated an outlay of approximately $10,000 per county, which is about the usual average in this province.

The revenue for road repair in Nova Scotia is derived from taxes upon property (a certain per cent. of the whole going to the road fund) and from a poll tax, these being paid either in cash or labor at the prevailing wage rate per diem. The property tax for the fiscal year 1910 amounted to about $95,000 in the eighteen counties of the province, and the poll tax to more than $80,000, making a total of $175,000, and this was pro rated among the several counties according to their requirements. Of this sum 70 per cent. was paid in labor—"worked out," as it is called.

During the year 25 road machines were imported from the United States at a cost of $5,375; one grader, and some other machinery were likewise purchased, a total of nearly $10,000 having been expended for new machinery. There are now about 75 road machines and 20 graders in the province. During the last five or six years road machinery to the value of over $20,000 has been purchased.

It is estimated that there are 72,000 culverts in Nova Scotia, ranging from 6 feet in width down to 1 foot. Practically all of the culverts constructed up to a short time ago were of wood, costing on an average $7 each, but some concrete, hard or vitrified brick, and stone culverts have been built in the last few years. Concrete culverts can be put in for an average cost of $20 to $25.

The permits issued last month at London, Ont., totalled $132,334, compared with $104,883 for April, 1910. The figures for the first four months of 1911 and 1910 are $218,197 and $326,715 respectively.

In the matter of building permits the city of Montreal last month practically tied with April, 1910, the totals being respectively $1,711,971 and $1,775,880. The permits issued from January 1st to April 30th of the current year, however, show an increase of nearly one million dollars over the first four months of 1910.

Surface blasting, or "dobeying," does not appreciably affect firm banks nor produce sliding of material, according to the report of an investigation made in Culebra Cut on the Panama Canal to determine the effects of blasting on the slides there. Little effect is noted in producing earth vibrations, and only small amounts of exposed material, previously loosened, are liable to displacement, but the air concussion is much greater than with heavy, deep shots and is mainly responsible for the shaking of houses. An instrumental test showed that the greatest shock of the "dobey" shots is transmitted through the air and little through the ground.

Possibilities of Brick and Terra Cotta

Practical Notes on Specifications and Other Interesting Details—Value of Lettering and Numbering Blocks—Constructional Details

In discussing the wonderful possibilities of brick over terra cotta in connection with building construction, a writer in a recent issue of Construction News points out that the material of which they are made plays many parts, and in conjunction with steel and iron framing is of the utmost value to architects and architecture. Continuing he says:

Terra cotta blocks are set in three different directions, viz.: placed vertically, horizontally and diagonally, and in arch work partake of and possess all the qualities of brick and stone without the excessive labor of cussing and setting always essential to these materials. Furthermore, in tile form, the possibilities are limited only by cost and requirements. Avoiding the use of terra cotta in work as alluded to, we will take up its employment in geometrical details, such as arches, groins, etc., all of which are difficult, both to manufacture and set. The fundamental basis of all construction is, of course, the drawing specifications, which for this class of construction must be clear and very specific, showing distinctly, to an exact scale, how the several constituent materials blend together to solidify the construction. Small ⅛ or ¼-in. scale plans, elevations, sections, etc., should be furnished by the architect with ½ in., ¾ in. or 1½-in. scale details of all molded work or curved, so that the manufacturers may lay out the work accurately and intelligently, without error or loss of time. It is not always for the maker of terra cotta to strictly adhere to and follow out the architectural drawings, and in many cases changes have to be made to complete the construction, but this may all be done by the co-operation and mutual agreement of all interested.

There are, however, some good rules to follow which are worth noting. If the dimensions on the details are vague, it should be the duty of the draughtsman to visit the works and compare the steel frame erected with every measurement. It is not wise to accept curved members on plans as accurate. It is better to make light wood or stiff paper or cardboard templets to fit the steel as set. This is imperative for finished work. The matter of tying and anchoring to iron, steel or brick core, members or backing must be fully provided for leaving holes, slots, etc., when molding.

The beds of all blocks, top, bottom and sides, should, as far as possible, be in the direction of the thrust or pressure. In vertical or horizontal work this is simple, on curved details difficult. In arch work the compression center line is in the middle of the depth of the ring, so that all top and bottom beds must radiate to the centre or centres, from which the curve or arch is struck. This applies to all arches from semi-circular to elliptic, and similarly to groins, the lines and intersections of which can only be obtained by geometrical development, in full-sized details and with the extensive application of patterns and molds.

Lettering and Numbering Blocks

The matter of lettering and numbering every curved or ornamental block to correspond with the numbers, etc., on the shop drawings must be done logically and systematically—using capital letters and Roman numerals for principal parts as bases, capitals, keystones, coigns, etc., and lower case letters, index figures and letters for minor parts.

The indexing, etc., is indispensable to the setter and should be accompanied by full classified lists with delivery invoice.

In arches, etc., special attention must be given to right and left-hand details when listing, especially for work of the higher class, such as for churches, schools, etc., where the Gothic and Romanesque styles of architecture are used, the blocks will be varied and intricate. Much delay and loss of time to masters and men are often caused by the absence of non-delivery of a single block, and it must be remembered that it is not always possible to employ a temporary dummy substitute of brick or wood. Of course, this is impossible in arches or groins.

On the building under construction, if a large amount of terra cotta is to be introduced, the constant presence of a skilled setter is imperative. He must act in unison with the ironworker and bricklayer foreman on the job, pick out all blocks, working from the listed and numbered plans and see them properly set, levelled and plumbed, test all centering and see same is the exact form required, ample in strength and in exact position, do all fitting and correct all errors and omissions, watch as to full anchoring and see that measurements are as shown, see to the full backing up with brickwork and so arrange that there shall be no possibility of cracking or disfigurement by unequal settlement or error in bonding. The difference between the thickness of the joints of the finished blocks and the rough brick backing is too frequently the cause of fractured blocks in fronts and other defects.

When Setting Brick or Blocks

In setting arch or ground brick or blocks, the top or extradii surfaces may be covered with paper, oiled or treated to resist water. This will give a fairly clean soffit to the completed arches.

The necessity of using good mortar, preferably cement, is urged and the keeping of all arrises and blocks fair on faces and beds, to preserve the equipoise and thrust. The insertion of all tie rods in all roof and floor beams and girders, and their presence, thoroughly screwed up and assured, before laying up any arch of brick or terra cotta, are necessary.

All voids liable to occur in fireproof buildings, such as terra cotta casings or jackets around steel-framed columns, must be filled up solid with bricks and brickbats and be fully slushed up solid with cement mortar, to form, as it were, an integral part of the steel core. Similarly with vacant spaces in girders. This simple job increases the strength and rigidity of the steel and protects the metal from injury by dampness, cold, heat or fire.

When Smooth Centre Surfaces are Necessary

For all tile arches in floor or roofs, either laid in layers at right angles or diagonally to the beam or girder-webs, smooth centre surfaces are necessary and are better covered with paper. Tile arches showing skew or herringbone soffits should invariably have the bonds reversed with each layer until the needed thickness of ring is built. It is advisable to have one ring layer set at right angles or square to the beam webs with the bonds broken. Never strike centres until it is assured that the mortar has entirely set.

From the foregoing it might be inferred that what has been written here is solely for those in charge, but it pertains to all interested in building, where constructions made of clay products are involved. So on this account it is of equil value to artisan, producer and mechanic alike. Building is largely a co-operative business, each branch of which contributes its share to erecting structures which architecturally shall constitute a perfect whole, each individual doing his part to gain this end, and receiving in return the compensation and reward of a reputation for perfect fulfillment of building laws.

Who Invented Portland Cement?

The question as to whether the original invention of Portland cement belongs to Mr. I. C. Johnson, of Gravesend, Eng., who is still living at the age of 100 years, or whether it should be ascribed to Jos. Aspdin, a bricklayer of Leeds, Eng., is raised by a correspondent of the "Engineering News," which deals with the matter in the following editorial:

"Portland cement, as it is known to-day, is a development and not an invention, so it is difficult to pick out one man to whom the honor of original discovery may be ascribed. Throughout the last half of the 18th century and the first quarter of the 19th, men were working on various perfections of the hydraulic lime first made in 1756 by Smeaton for his Eddystone Lighthouse, but although some of these experiments included the proportioning of various lime and clay compounds to be ground and burned together to form the cement—a marked improvement on Smeaton's simple burning of a natural rock—none carried the burning to the point of incipient fusion, which is the recognized essential in a Portland cement. Among these men was a bricklayer named Joseph Aspdin, of Leeds, Eng., who went farther than some others of his contemporaries apparently only in procuring, in 1842, a patent on his product, which he called "Portland cement," because, according to modern authorities, of the fancied resemblance of the set cement to Portland stone, an English limestone. Aspdin tried to establish factories for the manufacture of this cement but none of his attempts were highly successful, largely on account of mechanical defects in the plants and the uncertainty prevailing as to the correct proportioning of the ingredients.

"Some time between 1840 and 1850, it was found by the various manufacturers of hydraulic lime and "Portland cement," so-called, that burning to incipient vitrification produced a cement of much stronger and more stable qualities and beginning then, the manufacturer of Portland cement as now known, was developed. There is no definite record of just when this latest development started or who where the men behind it, but according to his own testimony, in a curious little pamphlet published a few years ago, the venerable I. C. Johnson, was among the first. About 1840 he left the well-known firm of White & Sons, cement and lime manufacturers, where he had introduced many improvements in their machinery, to take over a run-down plant where Aspdin or his successors had been manufacturing the underburned "Portland cement" of his invention. In this plant Mr. Johnson probably turned out the first real Portland cement, and founded the modern cement firm of I. C. Johnson & Company, Limited. Although he undoubtedly was responsible for many of the methods and much of the machinery that made Portland cement a superior product, there is no evidence that he was the first to realize the importance of high burning temperatures."

The Hydro-Electric Inauguration at Toronto

The celebration in Toronto last week was a fitting recognition of the enterprise and ability of those who have harnessed the great Niagara Falls and furnished power to Toronto and other municipalities. It is two years since the city of Toronto commenced work on this undertaking, after authorizing an expenditure of $2,750,000. To date over $1,000,000 has been expended. Mr. P. W. Sothman is chief engineer of the Provincial Hydro-Electric Commission, and Mr. K. L. Aitken, chief electrical engineer for the city of Toronto. Mr. Sothman, whose photograph is reproduced herewith, is a native of Denmark, and is 41 years of age.

Mr. P. W. Sothman.
Chief Engineer Ontario Hydro-Electric Commission

Active preparations are being made for the annual meeting of the American Waterworks Association, which is to be held at Rochester, N..Y, next month. J. M. Diven, Charleston, South Carolina, is secretary.

The city of Montreal is indignant because of the fact that the Mountain View apartment house, which was destroyed by fire recently, endangering many lives, was advertised as a fireproof structure. It is a coincidence that a Montreal paper reports the name of the builder of the Mountain View as "Jerry" instead of Larry. The slip may or may not have been intentional, although there is every indication that the Mountain View exemplified the art of the jerry-builder.

Plant of the Erindale Power Company

A Power Plant of Unique Design—900 foot Underground Water Channel—A.C.B. Generators — Canadian Turbines — Ferranti Switchboard — 2500 h.p. available

A cleverly designed little power plant has just recently been placed in operation on the Credit river at Erindale village, three miles up-stream from Lake Ontario and about 14 miles due west of Toronto. This plant was originally designed by the old Southern Light & Power Company, and was being financed by the defunct York Loan Company at the time of the latter's declaration of insolvency.

Some two years ago the property was taken over by the Erindale Power Company under the management of Mr. E. S. Edmondson. Since that date record progress has been made and in August of 1910 the first generator was placed in commission. A second generator has now been added and everything is ready for the installation of the third and last unit which will be placed in position as soon as the demand for power and light warrants it.

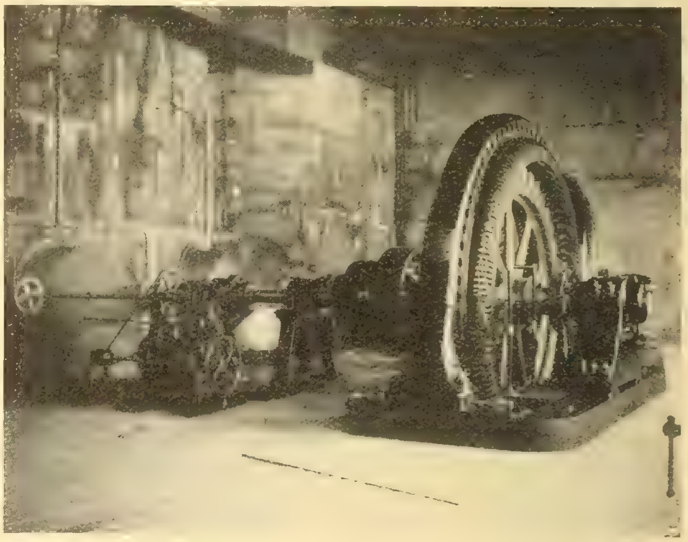
The Water Supply

Ferranti Switchboard—Erindale Power Co.

At Erindale village the Credit river takes a sharp turn and doubles back on itself within a length of little more than half a mile, passing over, at the same time, a series of rapids representing a total fall of some twenty-five or thirty feet. Up stream a further series of rapids formerly obtained and the river was enclosed by high, wide banks well suited for storage purposes. A concrete dam has been constructed at this midway point, some 34 feet deep, above the river bed (the foundation being carried 20 feet below the river bed to the rock), thus creating a storage area of upwards of 100 acres. This forebay is connected by an underground tunnel, through the narrowest neck of the peninsula, with the power house located on the river's bank below.

The large diverting dam is constructed of reinforced concrete and is some 700 feet in length. A 100-foot spillway with three 6-foot stop-log sluiceways occupy the central portion of this structure. The spillway is in two sections, as shown in one of the accompanying photographs, with strong reinforcing butresses in the middle and at each end, the latter heavily supported by staunch wing walls. The wing dams, lying to the right and left of the spillway, are concrete cored, with concrete cross wings averaging every 25 feet. (See figure of dam). These concrete cores are 8 feet wide at the base gradually narrowing to 16 inches at the top. Large quantities of earch and rock fill support the wing dams on both up-stream and down-stream sides. Extensive excavations were made for the concrete work which rests at every point on a solid rock foundation.

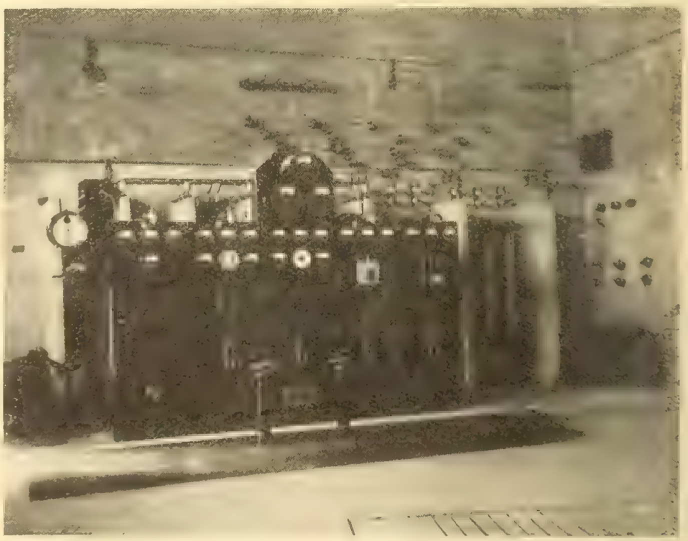
The intake is a concrete crib about twenty feet square, situated some distance up stream from the dam and equipped with head operated gates, stop-logs and wooden rack. The water-channel is wholly undeground, 12 ft. 6 in. in diameter, 900 feet long and lined with heavy reinforced concrete. This tunnel is horse-shoe shaped and has a drop of 1 ft. 6 in. in the 900 feet.



Two Operating Generators—Erindale Power Co.

The Power House

The power house is located about 200 feet from the river and on the side of a steep bank, so that the bulkhead, which is a part of the power house building proper, is set right into the bank. The design of the bulkhead is quite unusual, as shown in one of the photographs and in the horizontal



Exterior Power House—Erindale Power Co.

700 foot Dam across Credit River, forming a 60 foot head Erindale Power Company.

cross-section of the power house. It consists practically of four compartments: a main section containing the steel racks, feeding three smaller sections which project downwards to a level with the power house floor and correspond in fact to vertical penstocks. The main section of the bulkhead is supplied with a spillway closed with stop-logs, in case of water surges, and each of the three smaller sections may be shut off by hand operated gates. These were not installed when the photograph was taken.

Unusual care was observed in the reinforcement of the bulkhead and especially of the vertical concrete penstocks. In the latter, ⅞-inch iron rods placed horizontally encircle the penstocks every four inches, interlocking at each turn with the corresponding ring of the next penstock. In addition to this, heavy mesh reinforcement was installed on edge encircling the penstock, with ¾-in. steel and old rails vertically, and the face walls are 28 inches thick.

The turbines are single runner, centre discharge, type, the well-known "Canadian" turbine manufactured by the Chas. Barber & Sons, Meaford, Ontario. Two of the turbines, rated at 1,000 h.p. each, are now operating and all construction work necessary for the installation of the third unit is completed. The arrangement of the draught tubes and the discharge tunnel (all concrete structure) is shown in the vertical cross-section of the power house shown herewith.

The generators are Allis-Chalmers-Bullock manufacture, 3-phase, 60 cycle, 36 pole, 200 r.p.m., 13,200 volts, 600 kw. capacity. These generators are 14 feet diameter, 16-foot base and were the main determining factor in the polygonal shape of the power house. The generators are sets over pits 7 feet deep. These are all connected together forming a cable runway to the switchboard.

A feature of note in connection with the A.C.B. generators installed, and one which speaks well for the quality of insulation used by this company, is the fact that although the generators stood outside just as they came from the shop, for over four years, not a coil broke down. In drying out a bridge megger was used with excellent results. At the start the insulation resistance was so low that the instrument would not record it, but after running on short circuit with 150 per cent. full load current for 195 hours, a reading of 8 megohms was obtained. This was continued till a final reading of 150 megohms was obtained at the end of 175 hours.

The exciters are A.C.B. type, belt driven, 60 kw. capacity. Two are installed, either one capable of exciting all three generators. The governors are Woodward manufacture. Each turbine operates its generator through a flexible clutch.

As current is generated at 13,200 volts no step-up transformers are required, transmission being at that pressure. The switchboard is Ferranti manufacture, 5 panel, slate. In the rear of the switchboard cement compartments contain: (1) a small balancing transformer for operating the oil switches; (2) and (3) oil switches between the generators and busbars; (4) and (5) oil switches between the busbars and the main line; (6) lightning protection apparatus and (7) a pair of small 13,200/2200 volt transformers for local service.

Top View of Concrete Bulkhead.

Entrance to [illegible] foot Tunnel.

Reinforcements in Vertical Concrete Penstocks.

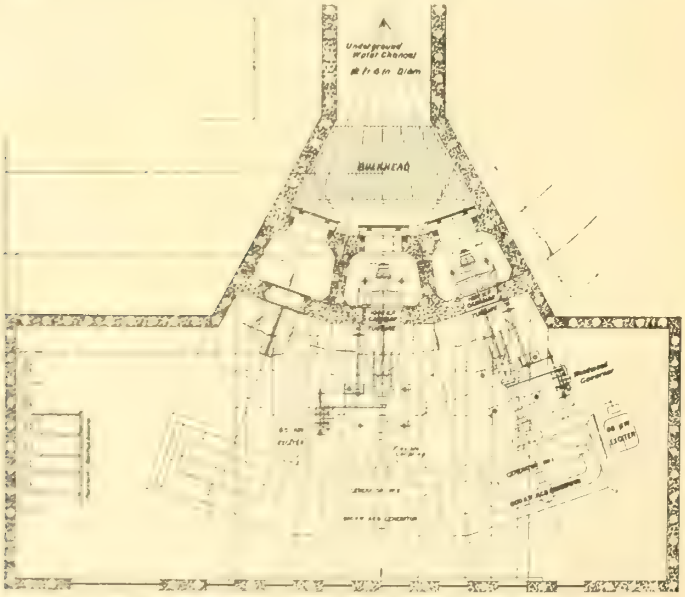
The power house is lighted by twelve 250 watt tungstens with holophane reflectors. All wiring is in conduit. A hand operated ten-ton crane operates on a track running the length of the power house.

Transmission and Distribution

Provision is made for a double line, to be carried by the same poles, but only one is yet installed. The distribution of light and power is in the hands of a second organization, the Interurban Electric Company, though both companies are under the management of Mr. Edmondson and of the same engineer, Mr. Thomas Henry. As stated above transformers situated in the generating station supply local requirements, chiefly the lighting of Erindale village.

Construction Work Erindale Power Co.

The main sub-station is at West Toronto, but two branches leave the main line before this point is reached; one to New Toronto where a sub-station, containing three 200 kw. 13,200 to 2200 volt transformers, serves the New Toronto, Mimico and Long Branch district; the other to Swansea to supply the Canada Nut & Bolt Works. This latter station contains two 250 kw. 13,200/220 volt, Scott connected transformers.

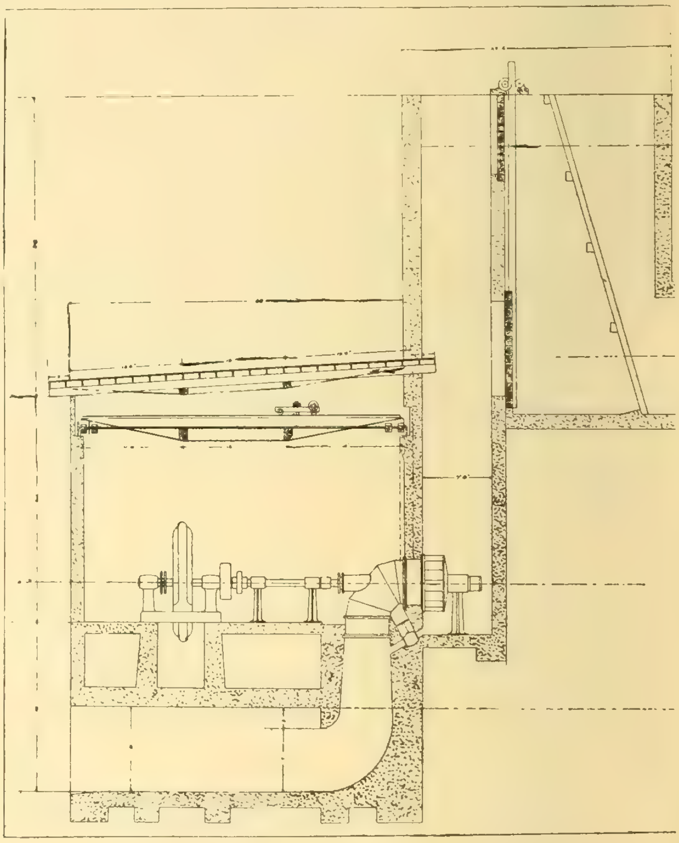


Horizontal Section Power House

The West Toronto station contains two 300 kw. transformers, Scott connected to change from three to two-phase. The incoming lines carry expulsion type fuses and lightning protectors of the Garton-Daniel spark-gap type. This station is also equipped with a 300 kw. 2200 volt rotary condenser for keeping up the power factor and helping the regulation. The low tension busbars in this station are also fed from the Humber generating plant of the same company where 900 kilowatts are generated by 4 units at 2200 volts, two-phase. From the low tension busbars West Toronto's light and power needs are served and lines pass in various directions to Lambton, Islington, Bracondale, Wychwood, Deer Park and North Toronto.

Power Rates

The power rates offered by this company run as low as 2 cents per kw.h. with a minimum charge of $15 per h.p. year; they also sell at ½ cent per kw.h. with fixed charge of $12 per h.p. year where power is taken in fairly large quantities. The house lighting rates have been 6 cents per kw.h. with monthly meter rental of 25 cents. Following the lead of the other systems operating in Toronto the meter charge may now be removed, in which case Toronto's western suburbs will be receiving power and light at more favorable figures than almost any other Canadian town.


Vertical Section, Power House and Bulkhead

The generating plant at Erindale and the more recent extensions to the distributing system have been designed by the chief engineer, Mr. Thomas Henry, and constructed under his direct supervision. Mr. Henry is now chief engineer in charge of the operation of the whole system which is similarly combined under the management of Mr. E. S. Edmondson.

Messrs. S. Pearson & Sons' successors, of Mexico, have just placed an important order for the delivery of six water turbines of 9,700 h.p. each, with the well-known engineering firm of Messrs. Escher, Wyss & Co., of Zurich, Switzerland. The turbines are destined for the Santa Rosalia power plant on the Conches river, Mexico, and are of the double Francis type, designed for working under a head of about 150 feet with a speed of 360 revolutions per minute, and will be fitted with Escher, Wyss & Company's latest designed oil pressure governors. The order further comprises two 450 h.p. exciter turbines with governors.

Montreal's Defective Building By-Laws

Important Evidence Elicited at the Mountain View Apartment House Enquiry—G.T.R. Developments—Trade News and Items of Interest.

Office of the Contract Record,
Montreal, May 6, 1911.

A number of serious fires that have occurred recently in Montreal, endangering many people's lives, as well as destroying property of considerable value, have emphasized the need of stricter and more effective building by-laws. The destruction of the Mountain View House, containing over twenty apartments, 17 of which were occupied, on the morning of April 28th, seems to have brought matters to a climax. The damage is estimated at $140,000. The proprietor, Mr. J. A. Jarry, of the City Law Department, stated in his evidence before the city fire commissioners, who held an investigation, that the building was worth $90,000. The amount of damage above mentioned includes the loss of furniture and also a considerable amount of damage to the adjoining house which was a twin of the one destroyed. The Mountain View was a five-storey apartment house and was known as a second class building. According to the city by-laws second class buildings are not allowed over four storeys or 60 feet in height, but the Mountain View was erected under the building by-laws of the Town of St. Louis before it became annexed to the city. It was advertised as a fireproof building, but when the test came it proved to be anything but fireproof.

In a statement given out in answer to criticisms, Mr. J. A. Jarry, builder of the Monntain View apartment home, which was recently destroyed by fire, says:

"In the first place, when one speaks of a fireproof building, one does not necessarily refer to structures which are absolutely proof against fire. Fireproof may mean structures wherein every facility is afforded the occupants to escape in case of fire. The building destroyed by fire was advertised as a fireproof structure, but everyone knows that there is not one building in Montreal which cannot be destroyed by fire. The proprietors of these buildings call them fireproof, simply because every precaution against fire is taken. Thus, in the building which was recently destroyed, every means possible was taken to safeguard the occupants in case of fire. Fire escapes were provided and were placed in most accessible positions. The exits were spacious, and, in fact, everything, humanly speaking, was done to protect all who might be in the building when fire broke out. As a matter of fact, the expeditious manner in which the building was cleared of all people at the time of the fire speaks for itself. I would venture to say that the destroyed buildings and its counterpart, the Mount Royal, would compare favorably with any structure of the kind in this city."

Mr. J. H. Lauer, secretary of the Montreal Builders' Exchange, in an interview regarding the building, after the fire, stated that in company with Mr. J. R. Gardiner, president of the Architects' Association of the Province of Quebec, he had visited the building last October and afterwards laid a complaint about the construction in the City Building Inspector's office. Later they wrote to the board of control urging the prompt revision of the building by-laws. A committee had previously been appointed to study and revise the building by-laws but apparently little progress had been made, and as a matter of fact the revision is not complete. Mr. Lauer stated that he knew of four or five other buildings in Laurier Ward, formerly the town of St. Louis, that were worse fire traps even than the one just destroyed. Mr. Lauer blamed the building inspection system of the city of Montreal, which, he said, was totally inadequate to accomplish the work owing to the insufficient number of inspectors.

Asked as to who prepared the plans for the building, Mr. Jarry declared that the court had no power to ask such a question. He refused to describe the plan of the building or the material used in its construction. He admitted, however, that there were four light wells surrounded by wood; that the staircase was of wood covered with brick, and the elevator shaft was of wood encased in iron. The building was insured for $75,000, and witness asserted that it would be worth $90,000.

The records at the city hall show that when the permit for this building was taken out the estimated value was placed at $20,000. This is only one instance among hundreds in which the estimates given when the building permit is applied for have been much below the actual cost. This fact was admitted by an official of the city, in the course of conversation with the representative of the Contract Record. He said that for statistical purposes records kept in the building inspector's office were perfectly valueless. They might safely be considered as being from 25 to 50 per cent. below the actual value of the buildings erected. It has frequently been the cause of comment that with the extraordinary activity of building operations in Montreal, this city should appear, in comparative tables on building construction, in the third or fourth place in the list. The fact that so many buildings are under-rated either for the purpose of saving the fees on the building permit, or keeping down the taxes on the completed structure, will easily account for this discrepancy which the city official above referred to was not in any sense to the credit of the citizens.

As one result of this fire chief Tremblay, head of the fire department, has been instructed by the board of control to make a thorough inspection of all apartment houses in this city and to report the conditions existing at an early date.

A short time ago a campaign was started in some of the local newspapers against over-crowding in moving picture theatres as well as the lack of exits or fire escapes in case of fire breaking out. As a result of this agitation Chief Tremblay was instructed to inspect all such places. The fact is that exits from moving picture theatres are quite inadequate in a large number of cases. Moreover, it has been shown that galleries which according to law should be supported by iron or concrete columns or some other incombustible material are held up by wooden pillars, which would quickly be destroyed in case of fire.

Several suburban municipalities adjoining Montreal are taking the lesson from this city's experience. Westmount has just decided that third and fourth class buildings, which include stucco and brick veneered houses, shall be prohibited in that city.

The council of the town of Outremont also is taking up the matter. The Mountain View apartment house was on Hutchison street, which is the boundry line between Outremont and Laurier Ward of the city of Montreal. A tenant in an apartment house similar to the Mountain View not even a block away from it has written the Outremont [illegible] states that there are not even fire escapes on the house in which he resides. The fact that any night they may be driven from their home or burned up in it makes the occupants all very nervous.

Grand Trunk Railway's Important Plans

The Grand Trunk Railway Company a few days ago sent to the city council a statement of its plans for new station accommodation to be erected at a cost of over $3,000,000 and other work including the construction of elevated tracks between Montreal West and Windsor street to the value of over eight million dollars.

Following are the details of the estimated expenditure:

[illegible]	$2,390,829
Excavations of foundations	96,833
Embankments	520,248
Concrete for abutments, piers and flooring	366,865
Concrete for retaining walls	66,713
Steel works	539,172
Paving	132,748
Tracks	247,633
Ballast	107,795
Station buildings	3,210,751
Miscellaneous	475,386
Total	$8,154,973

To this must be added ten per cent. for contingencies and superintendence amounting to $815,497, besides interest at five per cent. on a year and a half's construction, amounting to $448,529, making a grand total of $9,419,000. The city is authorized to contribute $2,000,000 towards this project. The details have been submitted to the board of control for their consideration.

A serious deadlock was threatened at the last meeting of the Montreal city council when Alderman Bastien stated that unless the board of control would take steps to fulfill the conditions regarding pavement and other public works under which several municipalities were annexed to the city last year he would take out an injunction against the city which would prevent the board of control from proceeding with any public work in any part of the city this year. At the present moment there is some prospect of Alderman Bastien winning the day, as most of the representatives of the recently annexed municipalities are with him in this matter and it is expected that the controllers and other members of the city council will submit to his contention so as to obviate the delay that would be involved.

A new building society, known as the Mount Royal Building Society, has been organized, the directors of which are principally railway men connected with the Grand Trunk. The object of the new society will be to provide the shareholders with houses at a cost slightly exceeding rental.

It is stated that a row of 27 stores will shortly be erected on Mayor street by the Evans Estate at a cost of some [illegible]

A new storehouse is to be erected on Recollet street by the Anglo-Canadian Oil Company at a cost of $20,000.

At a recent caucus of aldermen of the city of Montreal it was agreed that the proposal of the board of control to purchase the waterworks of Beaurivage in Longue Pointe Ward at a cost of $19,000. The present proprietor is Mr. Foucher.

Building permits to the value of $6,911,758 were issued in Toronto during the first four months of 1911, compared with $5,647,748 for the corresponding period of 1910. April, 1911, showed a good advance over April, 1910, the figures being respectively $3,272,818 and $2,522,058.

An Industrial Boom at Medicine Hat

According to information furnished us by Mr. A. K. Grimmer, city engineer of Medicine Hat, Alta., great activity is now prevailing in that city, which is enjoying an industrial boom through the development of natural gas. The construction programme for the present season is as follows: domestic sewers, $55,000; new gas wells and mains, $50,000; surface sewers, $35,000; concrete sidewalks, $35,000; water extensions, $30,000; curb and gutter, and boulevarding, $18,000; road grading and macadamizing, $12,000; additional fire apparatus, including motor driven auxiliary fire engine, $12,000.

An electric light plant, estimated to cost $50,000, now under construction, will be completed and in operation by July 1. An evidence of the rapid growth of the city is found in the statement that during the last two months over 100 water services have been installed.

As an industrial centre Medicine Hat is attracting increased attention. Since last fall the city has located the Alberta Iron Rolling Mlils, which will employ 100 men and install a plant and equipment at an estimated cost of $100,000; also the Alberta Linseed Oil & Paint Company, whose plant and equipment will cost $80,000. In addition, the city has granted concessions to a woodwork factory, a glass factory, machine shop and foundry, the Gordon Wire & Wire Nail Works, and a number of smaller institutions which, combined, will give employment to hundreds of men. At the present juncture it would seem that Medicine Hat is destined to become quite an important manufacturing centre. As indicated above, the development of natural gas is playing an important part in the city's progress. Another well has just been completed to the 1,000 feet level. Its capacity has not yet been determined but the indications are that it is stronger than any obtained heretofore. Operations are now in progress on other wells, special efforts in this connection having become necessary owing to the demands which will be made by the above-named industries. It is of interest to note that despite the heavy consumption of gas during the last five years, as shown by the daily records, absolutely no diminution of pressure has resulted.

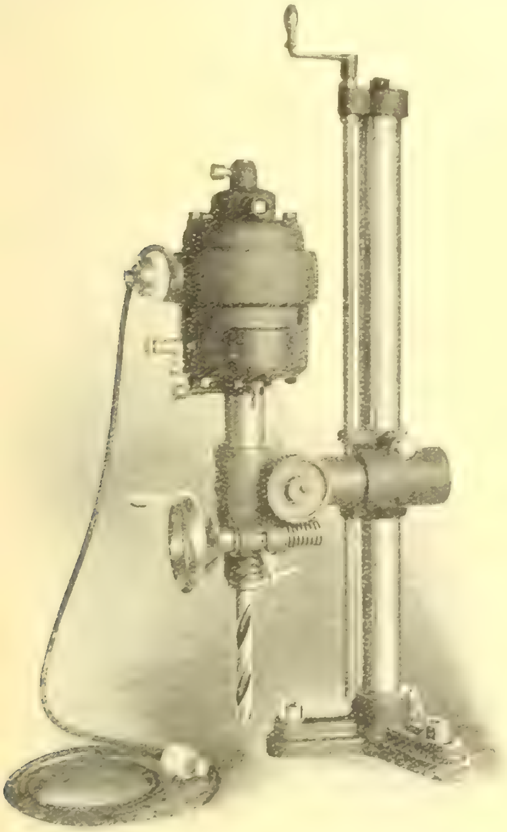
The permits issued at Calgary, Alta., for the month of April, totalled $1,127,256. The total for the year to date is $2,769,246.

The Canada Cement Company has just purchased a site of 100 acres of land, near Winnipeg, on which it is proposed to spend $400,000 in the erection of a large and modern cement grinding plant capable of turning out at least 2,000 barrels per day. Senator Edwards, president of the Canada Cement Company, accompanied by Mr. Frank P. Jones, the general manager, spent several days in Winnipeg completing arrangements.

Tenders for the building of the Canadian Navy closed last week at Ottawa at the office of the Deputy Minister of Naval Affairs, Mr. George Desbarats. While no official statement was given out as to the names and number of firms tendering, it is learned from an authoritative source that six firms in all tendered, chief among which are the Swan, Hunter, Wigham, Richardson Company, of Wallsend-on-Tyne, represented in this country by Mr. Charles I. de Sola, of Montreal; the Vickers-Maxim Company, represented in Canada by Mr. Ore Lewis, of Montreal, and the Armstrong Shipbuilding Company of England. The tenders call for the construction of four cruisers and six destroyers within a period of six years. As the contracts also stipulate that the vessels are to be built in Canada, the successful tenderer will be compelled to construct a shipbuilding yard in this country.

Electrically Operated Portable Drill

The cut shown represents an electrically operated radial drill recently placed on the market by the Lamb Electric Company of Grand Rapids, Mich. The motor is designed for operation at either 110 or 220 volts d.c. or a.c., 60 cycles. The specifications follow—capacity in steel, 1 inch and smaller, operated in any position, extreme height 40 inches, greatest height from spindle to base 28 inches, distance from column to centre of spindle 8¼ inches, column is 2½ inches diameter, made of steel tubing, hole in spindle No. 3 Morse taper, travel of spindle 5 inches, operated by rack and pinion which in turn is operated by a worm and gear, two speeds furnished.



A meeting of the Council of the Royal Architectural Institute of Canada will be held in the rooms of the Royal Institute, No. 5 Beaver Hall Square, Montreal, on Monday, June 5, at 2.30 p.m., to elect a vice-president, for the election of members, the consideration of applications for membership, the organization of the 1911 General Assembly, and the transaction of any other business that may arise. F. S. Baker, president; Alcide Chausse, hon. secretary.

Considerable building activity is anticipated in South Africa during the next few years and there is stated to be a good field there for manufacturers of concrete machinery. According to a recent report from Johannesburg, a [illegible] in that city has sold twenty-five American machines, which are the only ones obtainable. In the Transvaal only one firm makes a specialty of handling concrete mixers and it claims to have sold 90 per cent. of all the machines used. The selling price of the mixers mostly in use averages $675. Machines of British manufacture enter South Africa free of duty.

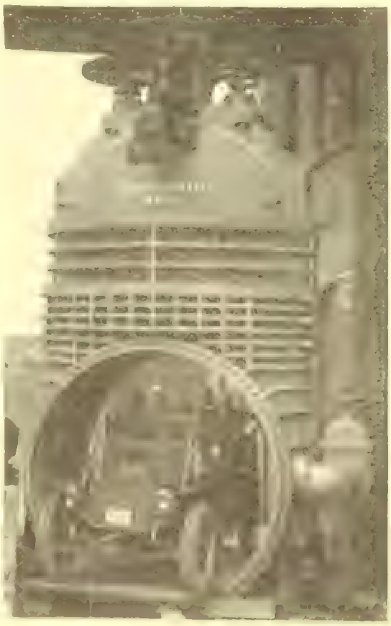
The Carlyle Johnson Machine Company, of Manchester, Conn., have sent us a copy of their Catalogue E, devoted to the Johnson Friction Clutch and accessories. It is claimed by the manufacturers that their product embodies all the principles which make a perfect friction clutch. The strong points about the Johnson clutch are that it is small, powerful and simple in operation, being compact and comprised of few parts, each of which is interchangeable. It runs at high speed, without vibration, and can be adjusted instantly to any tension with one screw. The Johnson clutch has been adopted by some of the leading manufacturers, who endorse it in the highest terms.

The Niagara & Ontario Construction Company has entered action against the F. H. McGuigan Construction Company, to recover over $17,000, the balance of their account in connection with the construction of the high tension lines for the Hydro-Electric Commission.

Readers of this journal will be interested to know that the manufacturers of "Glenboig" and "Gartcosh" fire brick have now placed on the market a new brick which they call "Glenboig A1." This is a higher grade than they have hitherto supplied. Mr. Alexander Gibb, 13 St. John street, Montreal, the manufacturers' selling agent, informs us of several recent tests of these brick, from which most satisfactory results have been obtained and upon the strength of which excellent contracts have been made. "Glenboig" and "Gartcosh" are claimed to be unexcelled for use by all furnace users. They possess a high reflective power and are guaranteed against melting and splitting off.

A Nine-foot Valve

The cut shown herewith represents one of the three valves manufactured by the Chapman Valve Company, of Springfield, Mass., for the Ontario Power Company, of Niagara Falls, Ont. The valve has a 108 inch opening, weighs 132,000 pounds, and is operated by a 15 horse power motor controlled from a distant station



At Toronto the [illegible] structural iron workers went on strike last week for an increase of 5 cents an hour. The present scale is [illegible] cents. The Hamilton members of the union are seeking the same increase. The carpenters' union is also negotiating with the employers for [illegible]

Personal Mention

Mr. R. S. Stockton has been placed in charge of the C. P. R. irrigation work at Strathmore, Alta.

Mr. Geo. W. Wright, formerly of Toronto and latterly assistant engineer to Mr. A. O. Graydon, has been appointed city engineer of London, Ont.

The city council of Toronto have adopted a recommendation to increase the salary of City Engineer Rust from $5,000 to $6,000. Mr. McCallum, the city architect, is raised from $4,000 to $4,500.

Mr. W. A. Clement, having severed his connection with the city of Vancouver, has opened offices in the Dominion Trust Building, Vancouver, and will carry on a consulting engineering practice with Mr. W. Coster, hydraulic engineer.

Mr. Norman L. Thompson, architect, Saskatoon, has taken into partnership Mr. T. B. Daniel (formerly with Messrs. Brown & Vallance) and Mr. G. B. Colhurst. The style of the new firm will be Thompson, Daniel & Colhurst.

His Excellency Earl Grey recently paid a visit to the Manitoba Bridge & Iron Works, of which Mr. T. R. Deacon is vice-president and general manager. The party afterwards proceeded to inspect the C. P. R. shops.

Mr. James E. Adamson, architect, has removed from the Coristine building and will in future be located in new office at Molson's Bank Building, corner of Stanley street and St. Catherine street west, Montreal.

Mr. Beaudry-Leman has been chosen by the Montreal city council as the civic representative on the electrical commission appointed to deal with the electric conduit system for the city. The Public Utilities Commission will name their expert shortly.

Mr. J. W. Astley, Engineer of Construction at Winnipeg, has notified the Board of Trade of that city of the receipt of an offer from the city of Victoria, B.C., of a post at a salary of $5,000. It is almost certain that Winnipeg will pay the price to hold Mr. Astley, a decision to this effect having been practically agreed upon at time of writing.

City Engineer Angus Smith after a prolonged tussle at Victoria has been successful in obtaining his principal points. His services will be retained and he will be assisted by a construction engineer. The latter position is reported to have been offered to Mr. Astley, of Winnipeg, who is now occupying a similar post in that city.

Mr. J. B. O'Brien, president of the Toronto Civic Guild, returned last week from New York and Boston, where he obtained information bearing upon the improvements contemplated at the intersection of King and Yonge streets, Toronto. At Boston Mr. O'Brien found that the works department of that city had recently been reorganized after the works department of Toronto—a not inconsiderable tribute to the ability of City Engineer Rust.

According to a local paper Mr. C. H. Topp, of Victoria, has succeeded in "putting one over" Mayor Morley. It will be remembered that he was engaged to undertake the survey of Sooke Lake. After he had commenced the work his appointment was vetoed by the mayor. As he had already commenced the survey, however, Mr. Topp ignored the veto and quietly proceeded with the work, during the whole progress of which there has been much argument as to whether ex-City Engineer Topp would get paid for it or not. Finally a committee was appointed and this body decided that the city had better pay wtih the best possible grace.

Calgary spent over a million dollars last month in building. This is exclusive of the Hudson's Bay store and other large buildings for which permits have not yet been granted.

The Chief Architect of the C. P. R.

Mr. Walter S. Painter, chief architect of the C. P. R., has occupied that important position with the company for the past six years. Mr. Painter was born at Reading, Pa., his father being a well known stove manufacturer of that place. Mr. Painter had a good high school education as a foundation for his professional training. He never attended college, but gained his professional knowledge by practical work and as an apprentice in leading architects' offices. He was a diligent student of all subjects relating to architecture and gained a thorough knowledge of important branches of architectural science by a private tuition.

After completing his training, Mr. Painter commenced business as an architect with Mr. George D. Mason, of Detroit. He designed the Russell Theatre at Ottawa, Ont., the Auditorium at Quebec, and the Majestic Theatre in Toronto. Immediately before joining the C. P. R. he undertook the designing, engineering, and construction of the roundhouse and machine shops for the Grand Trunk Railway at Mimico, Ont.

Since becoming associated with the C. P. R. in 1905, Mr. Painter has had the professional oversight and designing of the following works for this company:

Algonquin Hotel at St. Andrews-by-the-Sea; Chateau Frontenac (extension), Quebec; station and hotel at Macadam Junction; station at Mile End, Montreal; Place Viger station and hotel (additions and alterations), Montreal; Westmount station; Port Arthur station; Banff Springs hotel (reconstructed, with 400 rooms); Lake Louise Chalet, 350 rooms; Glacier hotel (reconstruction); Sicamous hotel, B.C.; Vancouver hotel; Victoria hotel (extension).

Mr. W. S. Painter,
Chief Architect of the Canadian Pacific Railway

It is stated that the G. T. P. has filed plans with the railway commission for the elevation of tracks and erection of new terminals at Montreal involving an expenditure of $10,000,000. All the tracks approaching the city will be raised at Bonaventure station to the Turcot yards and from St. Henri to the Point St. Charles yards, involving an immense amount of heavy grading and the building of viaducts over every thoroughfare crossed by the trains.

Canadian City Engineers

John L. Feeney, Fredericton, N.B.

John L. Feeney, B.Sc., city engineer of Fredericton, N.B., is a native of that city and received his early education at the high school there. Afterwards he proceeded to the University of New Brunswick, from which, in 1910, he graduated in civil engineering. In 1907 and 1908 he acted as assistant city engineer during his vacations. During 1909 and until his appointment as city engineer in May, 1910, he had charge of the water and filtration plant. During the spring of 1910 he took a special course of instruction in Boston and New York studying the system of mechanical water filtration, and also bacteriology. Subsequently he spent some time on street paving and drainage. He has recently written a report on street paving which has received considerable publicity in the technical journals.

City Engineer Feeney, of Fredericton, N.B.

The special committee of the Montreal city council appointed to revise the city's building by-laws, is sitting three times a week, but the work is so extensive that it will not be completed before next September. The experts who form part of the revising committee are Messrs. J. Venne, of the Architects' Association; S. D. Vallieres, builder; T. Charpentier, builder, representing the Builders' Exchange; P. C. Ogilvie, of the Master Plumbers, and W. J. Francis, of the Canadian Society of Civil Engineers.

The Oneida Lime Company, Limited, which has recently been reorganized, has commenced the erection of a large mill in the Township of Oneida, about five miles northwest of Cayuga, Ont. It is the purpose of the company to ship the sandstone, or silica, of which there are large deposits in the neighborhood of their quarries, to different points throughout Canada, for glass-making purposes. The plant will cost in the neighborhood of $25,000, and after the erection of the mill at least thirty-five men will be constantly employed in the industry. The company are also running a spur railway line from the Nelles Corners, G. T. R., station, to the quarries, a distance of two and a half miles. They have purchased the right-of-way for the entire distance. They have also recently purchased considerable property in the neighborhood and will utilize the natural gas for purposes of manufacture as they already own several wells. It is said that the opening up of these silica deposits may eventually lead to the operation of the glass factory in Cayuga, which was erected several years ago by an American company. It was then the purpose of that company to utilize these sandstone beds, but the American company sold the factory to an English firm.

The superintendent of the Oneida Lime Company is Mr. L. J. Faith, and Mr. Walter Anderson, of Hamilton, who first organized the company, is largely interested in the enterprise. The president of the company is Mr. Levy, of the firm of Gibson, O'Reilly, Osborne & Levy, of Hamilton.

Obituary

It is with much regret that we have to record the death of Mr. Robert Malcolm Young, of Toronto, formerly a partner in the architectural firm of Simpson & Young, but latterly consulting engineer with the Dominion Radiator Company. His death resulted from pneumonia following a cold. The late Mr. Young, who was 30 years of age, was a veteran of the South African war, having been a member of the first contingent to leave Canada under Major Barker. He had attained the rank of sergeant-major in the Queen's Own Rifles. He was of fine physique and an all-round sportsman, holding membership in a number of Toronto's leading athletic organizations. His loss will be felt keenly by the younger generation of the Queen City.

The Late C. C. Witchall, Toronto

The death of Christopher Charles Witchall, which occurred last week, removes a popular and familiar figure in Toronto contracting circles. The late Mr. Witchall was associated in business with his son John and had carried out the contracts for a number of important buildings, among which may be mentioned the Robert Simpson Company's store and warehouse, the Presbyterian Church at Rosedale, Knox Church, Broadway Tabernacle, John Leckie warehouse, Ogilvie & Sons' warehouse, [illegible] building, hydro-electric transmission station. Born at Coln, Eng., on June 7, 1846, and educated in the Old Country, the late Mr. Witchall came to Toronto [illegible] years ago. He had been carrying on business in Toronto for upwards of 30 years. He was an Anglican, a Freemason and an enthusiastic worker in the St. George's Society. The Bonar Presbyterian Church, the Yonge Street Methodist Church and the hydro-electric buildings were among his last contracts.

The Late C. C. Witchall.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Burlington, Ont.

Tenders addressed to O. T. Springer, clerk, will be received until May 25th for laying cement or concrete walks.

Brandon, Man.

The city council received the following quotations per sq. yd. on paving: Asphalt blocks, $3.39; creosote blocks, $3.35; granitoid, $2.55; bituletic, $2.95; macadamized, $2.70; Rocmac, $2.20. It is expected that paving costing about $110,000 will be done this year. Choice of pavement not decided.

Camrose, Alta.

The $83,000 by-law for construction of waterworks and sewerage systems was carried.

Carlyle, Sask.

On May 15th a by-law for $17,500 for waterworks purposes, will be submitted to the voters.

Cranbrook, B.C.

The sewer by-law to raise the sum of $100,000 for a sewerage system will be again submitted to the ratepayers on May 22nd.

Cochrane, Ont.

Messrs. Sutcliffe & Neelands, town engineers, are in charge of the installations of waterworks and sewerage here. Estimated outlay, $50,000.

Chilliwack, B.C.

Tenders were called until May 8th for construction of about 506 square yards of cement sidewalk and 535 lin. feet of concrete curb on Main street. J. B. Croly, city engineer.

The by-law to authorize the borrowing of $70,000 for street macadamizing was carried; drainage and road machinery by-laws, each $10,000 also carried.

Esquimalt, B.C.

The commissioners for above district are prepared to receive applications from engineers for the superintending of sewer construction. Plans and specifications may be seen at the office of the B. C. Land & Investment Agency. All applications to be in by May 2 next.

Tenders are called by the Esquimalt Waterworks Company for excavation for the purpose of completing the laying of the water main from Goldstream to Burleith, Victoria West.

Halifax, N.S.

The supply tenders of the Lawrence Hardware Company, for hardware ($1,886.91), Brookfield Bros., for lumber ($920.86), and Scotia Foundry Company, for special castings ($941), were recommended for acceptance.

Indian Head, Sask.

Tenders will shortly be called for concrete sidewalks. Drawings, etc., prepared by J. Bell, town engineer.

Lachute, Que.

Tenders are called until May 22nd for supply of about 280 tons of 8-in. c. i. water pipe. J. W. Raitt, town clerk. Advertisement in "Tenders and For Sale Department" of this issue.

London, Ont.

Tenders will shortly be called for three or four deep wells with 8-inch casing, about 12,700 feet of 4-in., 6-in. and 8-in. cast iron water pipe; about 35 hydrants and 8 tons of special castings; also 1 steel elevated tank, 125 feet high, capacity 40,000 or 50,000 gallons; pumping equipment not decided upon until wells are driven. Power will probably be from gas or gasoline engines. Two half million gallon pumps or greater, also deep well pumps or air lift will be installed. F. W. Farncomb, C.E.

Melville, Sask.

See "Power Plants."

Medicine Hat, Alta.

The following by-laws will be submitted to the citizens for approval: $4,000, plank sidewalks construction, $33,500, cement sidewalks, $17,500, curbs, gutters and boulevards; $8,000, street grading. A. R. Perry, secretary-treasurer.

Moose Jaw, Sask.

The by-law to expend $170,000 on permanent paving will be submitted on the 26th inst.

Tenders are called until May 29th for paving and concrete sidewalks, etc. J. M. Wilson, city engineer; W. F. Heal, city clerk. Advertisement in "Tenders aand For Sale Department" of this issue.

Niagara-on-the-Lake, Ont.

Tenders for repairing and enlarging the tank of the Niagara Waterworks system will be received until May 23rd. F. W. Paulin, C.E.; W. E. Lyall, clerk. Advertisement in "Tenders and For Sale Department" of this issue.

North Vancouver, B.C.

The following by-laws will shortly be submitted: Sanitary sewers, $180,000; storm sewers, $70,000; street grading, $205,000; sewers, $122,000; clearing, $11,000; school, $46,000; water, $25,000.

Ottawa, Ont.

Tenders are called until May 11th for supply of four street sprinkling carts. N. J. Ker, city engineer.

Prince Rupert, B.C.

Plans have been prepared for council by Col. W. H. M. Davis for a permanent water supply for the city. Estimated cost of $330,000 for supply main, $480,000 for whole work. The wtaer supply is taken from Woodworth Lake, seven miles from the city on the mainland. It is proposed to build a rock and timber dam at the outlet to raise the surface 30 feet. Later on the city will construct a concrete dam. As a separate scheme it is also proposed to construct a million gallons reservoir on Acropolis Hill. R. H. Thompson, city engineer of Seattle, consulting engineer.

Ridgetown, Ont.

Tenders will shortly be called for installation of waterworks here. 8-in., 6-in. and 4-in. pipe will be used. Complete equipment required. D. Cochrane, clerk.

Rouleau, Sask.

Tenders are called until May 29th for trenching, laying street water mains, hydrants, etc.; constructing reinforced concrete reservoir; erecting brick power house, for this municipality. W. H. Stewart, sec.-treas.; J. Darlington Whitmore, Regina. Advertisement in "Tenders and For Sale Department" of this issue.

South Qu'Appelle, Sask.

The council may increase cement pavement.

St. John, N.B.

The lowest tenders for granite block pavement were as follows: Pond street, B. Mooney & Sons; Nelson street, A. R. C. Clark; Dock and Mill streets, Hassam Paving Company.

Tavistock, Ont.

A new system of waterworks for Tavistock will be installed later on confirmation of by-law. There will be required about 7,000 feet of 4-in., 6-in. and 8-in. c. i. water pipe; one 40,000 gallon steel elevated tank; two steam driven pumps, half million capacity each; and one steam boiler. Specifications not yet completed; fifteen or twenty hydrants and special castings. F. W. Farncomb, C.E., London, engineer in charge.

Vancouver, B.C.

The following tenders were received: Grade Twelfth avenue, Granville to Hemlock, A. R. Gibson, $6,975; M. P. Cotton, $8,287.50; H. V. Tucker, $6,630; R. J. Preston, $8,287.50; Cleland & McLeod, $8,840; LaPlace Bros., $6,398. Tenders for grading—Grade Thirteenth avenue, Spruce to Birch, Cleland & McLeod, $5,149.90; A. R. Gibson, $5,500; D. Matheson, $5,149.90; LaPlace Bros., $5,989.20.

Grade Eleventh avenue, Spruce to Alder; Cleland & McLeod, $4,100; A. R. Gibson, $3,950; LaPlace Bros., $4,359.

Grade Twelfth avenue, Spruce to Alder, Cleland & McLeod, $4,131; D. Matheson, $4,712; A. R. Gibson, $4,050; LaPlace Bros., $4,608.

Grade Twelfth avenue, Main to Sophia, Cleland & McLeod, $2,600; LaPlace Bros., $2,841.

Bitulithic paving on Twelfth avenue, two sections, Columbia Bitulithic Company, from Bridge to Columbia, $14,300; from Columbia to Main, $20,891.34.

All the tenders were referred to the engineer for report.

Welland, Ont.

Tenders are invited until May 20th for construction of about one and one-half lin. miles. G. R. Boyd, town clerk.

Winnipeg, Man.

Tenders will be asked for the construction of the following sewers, the tenders to be in in two weeks: Portage avenue, Home street, Lenore, Ruby. The Portage avenue sewer from Smith to Colony will cost about $16,000.

Tenders addressed to chairman, board of control, will be received until May 17th for supply of 2,500 ⅝-in. and 250 ¾-in. water meters. M. Peterson, secretary.

AWARDED

Gleichen, Alta.

This municipality voted on the 26th inst for the second time on a by-law to spend $30,000 on waterworks and sewers, on account of a technical error in the original by-law, and carried the new by-law. The following contracts for materials have been awarded: Contract A., drilling deep well, the Alberta Well Drilling Co., Calgary; B., supply of lap-welded steel pipe, General Supplies Ltd., Calgary, for Stewarts & Lloyds. C., gate valves, Canadian Fairbanks Co., for Alley & McLellan's valves. D., hydrants, Calgary Ironworks Co., Calgary. E., elevated steel tank, Des Moines Bridge & Iron Co., Des Moines, Iowa. F., sewer pipe, Red Wing Sewer Pipe Co., Red Wing, Minn. G., manhole covers, etc., London Foundry Co., London, Ont. The work will be constructed by the John Galt Engineering Co., of Winnipeg and Calgary.

Harriston, Ont.

The following contracts were awarded for supplies for waterworks: Cast iron pipes and special casting ,the Gartshore Tomson Pipe and Foundry Co., Ltd., Hamilton, $31.20 per ton for cast iron pipe, and $2.75 per 100 lbs. for special casting; for lead and gasket. The James Robertson Co., Ltd., for lead $3.06 per 100 lbs., and $14.50 per 100 lbs. for gasket; for building water tower, the Hunter Bridge and Boiler Co., Kincardine, $3,505. That the tender of the Kerr Engine Co., of Walkerville, be accepted at $30 each for hydrants, and $24.50 for 10-inch valves, $15 for 8-inch valves, $9 for 6-inch and $5.60 for 4-inch valves. Eight tenders were received for cast iron pipe, seven tenders for hydrants and valves; three for lead and gasket; five tenders for the construction of water tower.

Moncton, N.B.

The contract for concrete sidewalk was given to George B. Low, Halifax, at the lowest prices, being 19, 21, 22, 23, 25 cents per lineal foot for the different classifications. During the summer the city proposes constructing about a mile and three-quarters of concrete sidewalks similar to the permanent walks laid last year and an expenditure of nearly $9,000 will be made.

Ottawa, Ont.

The Randolph Macdonald Co., Ltd., contractors, Toronto, have been awarded the following contracts by the Department of Railways and Canals for the improvement of the Upper Entrance to the Galops Canal, and also the contract for improving the entrance of the lower entrance of the Farrans Point Canal, both of the works are on the St. Law ence Canals.

Victoria, B.C.

Paving contracts for 600,000 square yards have been given to the Canadian Mineral Rubber Company of Toronto. The contract for only 169,000 square yards could be let forthwith, and one company mentioned was awarded the contract for that portion of the work, but with the added proviso that if a satisfactory agreement could be made with them in regard to the balance of the work tendered for, but not yet authorized, they will be awarded the contract for the remainder of the work also, on the terms of their contract, they being the only firm which submitted a tender for the whole of the work. Although the successful bidders were not the lowest tenderers on every street of the eighty-seven mentioned in the list, taken all over, their total figures worked out to be $24,000 cheaper than a combination of the lowest tenderers on all the streets, so that on the general paving of the approximate yardage tendered was 580,000 square yards. The pavements will be light or heavy, according to the measure of the traffic they are subjected to. The heavy calls for a five-inch base, a one-inch binder and a two-inch wearing surface, the light for a four-inch base and a two-inch wearing surface. The total bid of the winning company for the entire contract is $1,150,000.

Waterloo, Ont.

The tender of Mr. H. B. Duering, the lowest, was accepted for construction of cement sidewalks; that of Mr. Paul Bergman for the construction of cement curbing was also accepted.

The specifications for latter contract were as follows. Curb and gutter, 42c. per lin. ft.; driveways, 13c. per sq. ft.; 4-inch tiling, per lin. ft., 5c.; rate per hour for labor, 22½ cents; rate per team and man, 40 cents; brand of cement, National Durham. Specifications for former contract were as follows: cement wall, 10c. per sq. ft.; street crossings, 17c. per sq. ft.; alley, 13c. per sq. ft.; private, 12c. per sq. ft.; extra filling, 70c. per cu. ft.; extra gravel, 70c. per cu. ft.; 3-inch tile drain, 7c. per lin. ft.; 4-inch tile drain, 9c. per lin. ft.; 6-inch sewer tile drain, 15c. per lin. ft.; 9-inch sewer tile drain, 30c. per lin. ft.; 12-in. sewer tile drain, 50c.; brick work laid upon cement, $20 per M.; rate per hour for labor, 22½c.; rate per hour, team with man, 40c.; brand of cement—

Welland, Ont.

The contract for pump and water wheel for the new waterworks pumping station was let to the Canadian Boving Company, of Toronto, the lowest tenderer; the contract calls for a 3,300,000 horizontal triplex single acting pump developing 250 horse power on a 7-foot head, for which the price is $11,900. Added to this is a travelling crane costing $400, making the total contract price [illegible] The pump and wheel are [illegible] speed machines. Other tenders were: John McDougal Co., Montreal, pump and turbine, $14,069; John T. Farmer, Montreal, pump and turbine, $15,250; Goulds Pump Co., Montreal, pump and turbine, $15,250; Smart Turner Machine Co., Hamilton, pump and turbine, $18,500; Wm. Hamilton Mfg. Co., Peterboro, pump and turbine, $14,600; Escher Wyss & Co., Toronto, pump and turbine, [illegible]; the Canada Foundry Co. and John Inglis Co., tendered for pump only. As soon as the plans are completed for the pumping station tenders will be called for.

Railroads, Bridges and Wharves

Brandon, Man.

The Grand Trunk Pacific will commence at once the survey for a line into Brandon.

Beaumaris, Ont.

The Dominion government will build a wharf here, 280 feet long by 30 feet wide. It will be built of concrete with pile foundation. Tenders will be called for about June. Estimated cost, $25,000.

Courtright, Ont.

Tenders are called until May 20th for building concrete abutments and concrete floor for the Club bridge over Black Creek. Bell & McCubbin, engineers, St. Thomas. Advertisement in "Tenders and For Sale Department" of this issue.

Chatham, Ont.

Tenders addressed to A. McArthur, clerk, Tp. of Chatham, will be received until May 18th for construction of two steel and concrete bridges to be built over the Maxwell Creek Outlet, Dredge Cut, etc. Plans, etc., at the clerk's office in Tupperville.

Coquitlam, B.C.

According to the plans submitted by the C. P. R. officials to the council, the proposed repair shops which the company will erect will comprise an immense plant capable of looking after all kinds of repairs to the company. These repair shops will cover an area practically two miles long. South of this area occupied by the various repair shops and roundhouses will be another tract having over a mile of water frontage on the Fraser, which is to be reserved for industrial enterprises or eventually such purposes as the company may require it for. F. Busteed, general superintendent, C. P. R. Pacific division, divisional engineer, J. Rindall.

Edmonton, Alta.

Tenders are called until May 29th for construction of the piers and abutments for bridge over the Saskatchewan river. A. J. Latornell, city engineer. Advertisement in "Tenders and For Sale Department" of this issue.

Fort Frances, Ont.

It is stated that E. W. Backus and others are about to build a combination foot, vehicle and wagon bridge across the head of the falls over to International Falls, Minn. The bridge will be a steel structure upon cement piers. The steel part will be 900 feet long; with the approaches the bridge will be 1,784 feet long, and the width [illegible]

Harrietsville, Ont.

Tenders are called by W. B. Lane, clerk, Tp. North Dorchester, until May [illegible] feet long, either rock elm, red beech or white oak to be delivered here on C.P.R. on or before June 1st.

Kindersley, Sask.

Tenders are called until May [illegible] by the Department of Public Works for the following: One reinforced bridge over creek, south of Kindersley; two reinforced concrete bridge abutments [illegible] Eagle Creek, west of Harris; two reinforced concrete bridge abutments over creek, west of Harris. F. J. Robinson, deputy minister.

Little Anse, N.S.
Tenders addressed to R. C. Desrochers, secretary, public works department, Ottawa, will be received until May 22nd for construction of breakwater here. Plans, etc., at this department and at the offices of district engineers at Halifax and Antigonish, N.S., and on application to the postmaster at Arichat, N.S.

London, Ont.
Tenders for the following work on bridges will be called until May 13th: Abutments and floor for bridge over Bear Creek, Caradoc Township; abutments and floor for bridge on the line between lots 12 and 13, concession 9, Lobo Township; abutments and floor for bridge on the line between London and Lobo Township, London Townships concrete floor and addition to concrete abutments for bridge in concession 11, on Proof Line road, London Township; concrete floor and abutments for bridge on the line between Lobo and East Williams Townships, Lobo Township; abutments and floor for bridge over Sauble river, on Sauble line, Biddulph Township; a reinforced concrete bridge on the line between Dorchester and Nissouri Townships, on the Governor's road—16-foot span; a reinforced concrete bridge on line between the town of Parkhill and the township of West Williams—16-foot span; a concrete culvert opposite lot 5, concession 6, McGillivray Township; a concrete breakwater on the line between East Williams and McGillivray Townships, on Mud Creek flats—100 feet long. County Engineer, Talbot.

North Vancouver, B.C.
Messrs. Cleveland & Cameron, consulting engineers, Winch block, have had plans prepared for the construction of wharves along the frontage of Lonsdale estate, a distance of about half a mile. One pier, 1,500 feet long, is a feature of the work. It is understood that tenders have been called privately.

Prince Albert, Sask.
Tenders addressed to R. C. Desrochers, secretary, department of public works, will be received until May 22nd for construction of wharf and protection work on the North Saskatchewan river at Prince Albert. Plans, etc., at above department and at the office of F. G. Goodspeed, Esq., district engineer, Edmonton, Alta.; L. B. Elliott, Esq., acting district engineer, Calgary, Alta., and on application to the local postmaster.

Regina, Sask.
The G. T. P. line into Regina will be completed in time for the Dominion Exposition.

Tenders are called by Department of Public Works until May 12th for construction of two reinforced concrete bridge abutments over Pipe Stone creek, south of Wapella; two reinforced concrete bridge abutments over Qu'Appelle river, south of Lipton. F. J. Robinson, deputy minister.

Vancouver, B.C.
Tenders addressed to R. C. Desrochers, secretary, department of public works, will be received until May 22nd for supply of metallic fittings, railway mail service.

Winnipeg, Man.
The exact terms of the agreement between this city and the Midland Railway, it is reported, have been settled. According to the understanding reached, there will be four subways south of the Assiniboine river, at Crescent road on the north,, at Wilkes avenue, the south boundary of the city, and at two other crossing avenues that may in the future be designated by the city. Special provision was also made for subways when required on the north side of the river at the crossing of Lavinia, Ellice and Sargent avenues. These avenues have not been opened up to the right-of-way of the Midland, but when they are and the city deems it necessary the railway will put in subways at its own cost. Chief Engineer Hogeland and R. E. Taft, engineer of construction. General manager J. M. Gruber, St. Paul, C. D. Eddy, assistant engineer, and J. T. Maher, right-of-way agent.

Zurich, Ont.
Tenders are called until May 22nd for construction of ten small cement abutment, cement floor and steel beam bridges. F. Hess, Sr., clerk, Zurich. Advertisement in "Tenders and For Sale Department" of this issue.

AWARDED

Lethbridge, Alta.
The Canadian General Supply Company have been awarded the contract for construction of overhead bridge on Coutts street by the C. P. R. Work will start at once.

London, Ont.
The Township of Nissouri has awarded contracts for bridges as follows: A steel and concrete 50-foot span over the Wye at Wyton, $1,763; Joseph Patterson, of St. Mary's, gets the concrete work, and the Sarnia Bridge Company the steel. The same contractors have the work on a 45-foot span over Doty's Creek on the seventh concession, at $1,378; a reinforced concrete bridge twenty feet long was awarded to Patterson at $398. Two foot concrete affairs were awarded to George Holden and Robert Sugden at $200 each.

Public Buildings, Churches, Schools, etc.

Aylmer, Ont.
It is announced that a new government building will be erected this year.

Berlin, Ont.
The ratepayers will vote on a $15,000 by-law for hospital wing.

Burnaby, B.C.
A building site of two acres has been purchased on Vancouver Heights for the new school.

Chatham, Ont.
The school board have purchased the site known as the Scane property for the 8-room school building and have secured plans for erection of a building to cost $20,000.

Campbellton, N.B.
Tenders were called until May 6th for erection of Baptist church here, of brick and stone. Leslie R. Fairn, architect, Aylesford, N.S.; W. P. Gray, chairman building committee.

Chesley, Ont.
A new government building containing the post office will shortly be erected on the west side of the main street.
Tenders were called until May 10th for erection of brick and cement school here. S. Laughlan, secretary, board of trustees; Leslie R. Fairn, architect, Aylesford, N.S.

Emerson, Man.
An immigration hall will be built by the Dominion government.

Elmira, Ont.
Elmira is now considering the erection of a Carnegie Library, on a site large enough for a town hall and fire hall.

Fenelon Falls, Ont.
W. B. Taylor, Fenelon Falls, is in charge of the erection of the Methodist church here.

Guelph, Ont.
Competitive plans for the new jail and jailor's residence will be invited by the committee in charge. Mr. Beattie, secretary.

Gull Lake, Sask.
Tenders were called until May 10th for erection of 8-room school here. Plans, etc., with James Ferguson, secretary-treasurer. this place.

Georgetown, Ont.
Tenders addressed to the secretary, public school board, will be received until May 20th for heating by steam of public school here. Specifications, etc., with above.

Galt, Ont.
Tenders addressed to John Lee, chairman, Box 323, Galt, will be received until May 17th for the different trades required in the erection of a school for No. 22 North Dumfries. Plans, etc., at residence of W. Scott, Chapman street, Galt, and at the office of the architect, Mr. Knechtel, Berlin.

Hull, Que.
D. Chene, city engineer, is preparing plans for the new kindergarten school to be erected here. Noted in last issue.

Hamilton, Ont.
The Poles of this city have under consideration the erection of a church to be used exclusively for their nationality. Estimated cost, $40,000.

McTaggart, Sask.
Tenders addressed to H. R. McHoull. will be received until May 16th for erection of St. Andrew's Anglican Church. Plans, etc., at office of Standard Bank.

Medicine Hat, Alta.
The plans for the new St. Barnabas church have been accepted. Calls for tenders to be in by May 16th will be made at once.

Montreal West, Que.
Plans for a stone and brick church are being discussed. Messrs. E. J. Bedbrooke and R. A. Brook, wardens.

Montreal, Que.
Mr. Alphonse Venne has been appointed supervising architect for the new military college to be built at Montreal South for the federal government.
Mr. G. A. Monette, architect, is preparing plans and specifications for a large convent building and chapel to be erected on Mount Royal avenue for

the Sisters of the Congregation of Notre Dame.

The Grand Seminary of the Sulpician Order has called for competitive plans for a new library building, the competition being open until June 1st.

Permits were issued for Catholic church, Laurier avenue, $55,000.

The Montreal Reform Club have under consideration the erection of a club house in the near future. Mr. J. C. McDiarmid, president.

Netherhill, Sask.

The Anglican congregation here will erect a new church.

Ottawa, Ont.

The Ottawa Amateur Athletic Club are calling for tenders until May 15th for purchase of buildings at present on their property. D. J. O'Donahoe, sec.-treas.

Orillia, Ont.

Tenders addressed to Gordon & Helliwell, architects, Confederation Life Building, Toronto, will be received until May 20th for erection of Sunday school building for the Presbyterian church here.

Outremont, Que.

Tenders are being taken for all works, above ground line, in connection with the new Baptist Temple, corner of Fairmount and Durocher streets. J. E. Adamson, architect, Constine Building, Montreal.

Rosser, Man.

Tenders were called until May 10th for erection of frame school on the N.W. 30, 22 1E. E. R. James, secretary-treasurer.

Prince Albert, Sask.

Tenders were called until May 8th for erection of 4-room school. H. W. Halpin, secretary.

Port Rowan, Ont.

Tenders for masonry, carpentry, roofing, plastering, in connection with erection of the Neal Memorial Church here, will be received until May 18th. W. D. Chown, architect, Toronto. Advertisement in "Tenders and For Sale Department" of this issue.

Regina, Sask.

A country club has been formed and land purchased on which, it is stated, a building will be erected. G. R. Whitmore, G. H. Marsh and J. L. R. Parsons are interested.

Revelstoke, B.C.

The court house here will entail an expenditure of about $100,000.

It is reported that tenders for the provincial court house will be called to be closed on May 23rd. R. H. Hooper has prepared the plans.

Saskatoon, Sask.

The Y. W. C. A. will build part of their new home this year. Mrs. F. G. Sparling, chairman, building committee.

St. Vital, Man.

A city hall will be erected here on St. Mary's Road at an estimated cost of $15,000. Councillor Wilson is interested.

Seaforth, Ont.

Tenders addressed to R. C. Desrochers, secretary, public works department, Ottawa, will be received until May 29th for construction of post building here. Plans at the office of Mr. H. J. Lamb, district engineer, London, Ont., at the post office, Seaforth, and at this department.

Saskatoon, Sask.

The Wesley congregation will erect an extension to their church at a cost of $13,000. Frank P. Martin, architect.

Tenders are called until May 12th for erection of addition to the Land Titles Building. Messrs. Storey & Van Egmond, architects, Regina. F. J. Robinson deputy minister, department of public works, Regina.

The congregation of Christ Church appointed the following on the committee to proceed with the building operations of the church: Messrs. W. Warren, Cheetham, Benson and others.

It is understood that the property of Mayor Clinkinskill recently purchased by the Dominion government, will be used as a building site for the new armory.

Tilsonburg, Ont.

A by-law to raise $25,000 for a new public school has carried. Work will start during the summer.

Toronto, Ont.

Tenders are called by Burke, Horwood & White, architects, until May 12th for excavating basement of the new Central Y. M. C. A., also for removal of present house.

Tenders addressed to the secretary-treasurer will be received until May 12 for enlargement or Earlscourt school; also of Annette street school. Advertisement in "Tenders and For Sale Department" of this issue.

Dr. Hastings, M.H.O., in his report, recommends the following: To care for communicable diseases, other than tuberculosis and smallpox, the erection of six new buildings, alterations to the two old buildings now erected, and the purchase of more land; $165,000 for new buildings and a dispensary to care for tuberculosis patients; a separate building for measles and whooping cough.

The congregation of St. Paul's Presbyterian Church have started a campaign to raise $50,000, $30,000 of which will be spent in the erection of an institutional S. S. hall.

Vancouver, B.C.

We are informed that tenders for the erection of a building for the British & Foreign Bible Society will be called about June. C. P. Jones, A.R.A.I.C., 429 Pender street west, architect.

Weyburn, Sask.

The Weyburn school board are asking for tenders for the erection of a four-roomed school. Plans, etc., at the office of Mr. Geo. J. Jarrett, architect. The building must be ready for occupation by September 1st next.

West Toronto, Ont.

The congregation of St. [illegible] have decided to erect a parish house and school house.

Winnipeg, Man.

The erection of a new church is being considered by the congregation of St. John's Methodist church. Rev. R. L. McTavish, pastor.

Tenders are called until May 12th [illegible] the congregation of St. Ignatius, Fort Rouge. H. J. Rill, architect.

The Masonic Temple Association have purchased a large block on Furby street. It is understood that a new Masonic hall will be built on this.

The Winnipeg Hunt Club and the Polo Club will probably erect a building in the vicinity of Tuxedo park. Messrs. Hough, Abbott, Major Macdonell and Captain Shaw were appointed on a committee to report further on the matter. D. C. Cameron, president.

Tenders addressed to the chairman, board of control, will be received until May 15th for supply of labor and materials required in erection of Science and Arts building at the Exhibition grounds.

Permit was issued to Winnipeg School Board for addition to Strathcona school.

AWARDED

Calgary, Alta.

The contract for the new First Baptist Church, Calgary, corner of Thirteenth ave. and Fourth street west, has been let to J. B. Gunn & Co., of Winnipeg.

Carleton Place, Ont.

The contract for the rebuilding of Zion Presbyterian church, destroyed by fire a year ago, has been awarded to Messrs. Moffatt & McGregor, $20,000. it will be built of Beckwith stone. The building will be heated by steam and will have a perfect system of ventilation. The date for completion is December 1st.

Edmonton, Alta.

The following contracts in connection with the interior work on the Parliament Buildings and Court House were awarded: electric conduit wiring, on both, Cunningham Electric Company, Calgary; plumbing and heating, court house, McKnight & Frost, Edmonton; ornamental iron stairs, both buildings, Canadian Ornamental Iron Company, Toronto; marble, court house, Wm. O'Neil & Co., Vancouver.

Regina, Sask.

The contract for erection of public library was awarded to Wilson & Wilson, $43,700; other tenderers were, Snyder & Sutherland, $44,318, Parsons Construction Co., Ltd., $52,120; Smith Bros. & Wilson, $51,500, all of Regina. Storey & Van Egmond, architects.

Winnipeg, Man.

The contract for erection of tubercular hospital has been awarded to Shepley Construction Company, Builders' Exchange, $85,000.

Residences

Calgary, Alta.

Tenders were called until May 9th for erection of double house on Sixth avenue east. F. J. Lawson, architect, Norman block.

Hamilton, Ont.

A permit was issued to Stewart & Witton for residence for manager, Bank of Montreal, [illegible]

Montreal, Que.

Ex-Ald. S. D. Vallieres is building ten houses on Fabre street at a cost of [illegible]

S. Arnovitz is building three houses on Esplanade avenue at a cost of [illegible] 000.

Tenders were received until May 10th for a large apartment house on Du-chester street west for Mr. Hibbard Jas. E. Adamson, architect, Coristine Building.

Mr. Noe Leclaire is adding four three-storey houses to his block on St. Urbain street at a cost of $14,000.

Mr. S. P. Forest is building four houses on Hutchison street, to cost $16,000.

Permit was issued for a house on McGregor avenue, to Mr. McKein, $25,000.

Outremont, Que.

Tenders will be called for in a few days for block of 12 flats and stores to be erected here. J. E. Adamson, architect

Prince Albert, Sask.

H. M. Hueston and A. C. Holmes have plans under way for the erection of fifty residences.

Toronto, Ont.

C. S. Williams, of 43 Kendal avenue, has purchased the southwest corner of Brunswick and Bernard avenue. The buyer intends to erect an apartment house on the site.

Mr. D. Lavine has purchased the property on the northwest corner of Parliament and Aberdeen streets. It is undecided as to whether an apartment house or four detached houses will be erected.

AWARDED

Montreal, Que.

R. P. Du Tremblay is building a residence on Laurier avenue. J. A. Karch, architect; O. Lamoureaux, contractor.

The following contracts for erection of residence for Dr. A. Munro have been awarded: Painting and glazing, J. Sears; plasterer, E. Coulombe; roofers, Messrs. Richardson, Simard & Co.; electric wiring, the Moncel Electric Co.; excavation, masonry and brick work, James Young; carpentry, T. C. M. Bulmer.

Messrs. McVicar & Heriot are the architects and Messrs. Peel & Peel the contractors for a three-storey brick dwelling to be erected on McGregor street for Mr. A. McKim at a cost of $25,000.

Nelson, B.C.

The contract for erection of residence for Mr. A. Leith has been given to J. Dancy &Co., $3,800.

Winnipeg, Man.

Permit was given for three apartment buildings, St. Paul avenue, $120,000, to Thos. Oddson; Davidson Bros., contractors.

The contract for erection of Ellesmere apartments has been awarded to Nelson & Foster, 273 Higgins avenue, $55,000.

Business Buildings and Industrial Plants

Belleville, Ont.

The G. T. R. management will erect a new station, it is reported.

Bracebridge, Ont.

It is understood that the Queen's Hotel recently purchased by a syndicate representing the temperance interests will be torn down and a modern building erected in its place. Estimated cost, $10,000. J. F. Williams, M.D.; John Thomson, druggist, and D. E. Bastedo, sheriff, are interested.

Claresholm, Alta.

The Alberta Beet Sugar Company will build a factory.

Tenders were called until May 9th for erection of bank buliding here for Union Bank of Canada. F. J. Lawson, architect, Norman Block, Calgary.

Calgary, Alta.

R. W. Brown, a manufacturer, of Washington, D.C., has written the secretary of the board of trade offering to start a paper box factory here if he can secure certain civic privileges.

Chatham, Ont.

Palmer Bros. have secured plans for erection of 2-storey addition to their bakeries. Cost, about $5,000.

J. L. Wilson & Son, architects, are preparing plans for a new 3-storey addition to be built of concrete, brick and slow burning wood construction for the Wm. Gray, Sons, Campbell Co., Ltd. Estimated cost, $8,000.

Estevan, Sask.

Arrangements are being made for the formation of a company for the manufacture of sewer pipe under the supervision of F. N. Tennant.

Edmonton, Alta.

Tenders for the erection of the hotel here for the G. T. P., it is stated, will be called for on July 1st of this year. Plans for the hotel in Winnipeg will be completed in about three weeks.

Gilbert Plains, Man.

The Western Canada Flour Mills elevator was burned to the ground on the 4th inst.

Guelph, Ont.

The city council have authorized the city to make a loan of $20,000 to the Independent Tire Company of Toronto. In return the Independent Tire Company are to erect in this city on or before the first of July, 1912, a factory which will cost at least $50,000. The by-law will go to the ratepayers on May 29th. H. H. Hastings, general manager.

Humboldt, Sask.

M. F. Beach, Iroquois, Ont., has been inquiring regarding the location of a flour mill here.

Hamilton, Ont.

Permit was granted to the Westinghouse Company for a brick addition to pattern shop and addition to machine shop, $65,000.

Lethbridge, Alta.

The Great West Saddlery Company, represented by R. J. Hutchings, have applied for an industrial site of one acre.

The Massey-Harris Company, Toronto, have under consideration the erection of a brick warehouse and office here. A. W. Trickey, manager of the southern branches.

Lachine, Que.

The Allis-Chalmers-Bullock factory is reported damaged to the extent of about $60,000.

Medicine Hat, Alta.

The agreement with James H. Preston for the location of a planing mill here at a cost of $50,000 has been ratified by the council.

The Gordon Nail Company, formerly of St. John, N.B., will build a plant to cost $80,000 at this city.

Tenders will be called about May 20 for erection of factory for Alberta Linseed Oil Mills, also elevator. John McNeely, official in charge.

Moose Jaw, Sask.

Storey & Van Egmond, architects, Regina, have been awarded the contracts for plans of three large buildings to be erected at Moose Jaw. One will be a six-storey office building; another a two storey structure for the Moose Jaw Times; and the third is a stone structure 25 by 80 feet and three storeys in height.

Tenders addressed to Storey & Van Egmond, architects, will be received until May 26th for erection of the following: One office building, reinforced concrete construction, six storeys and basement; one printing office, mill construction, two storeys and basement, both for the Times Company; one store building, three storeys and basement. Plans, etc., at the office of the Times Company, Limited, Moose Jaw; the Builders' Exchange, Winnipeg, and at the office of the architects.

Montreal, Que.

Permit was isued to Mr. Stanley Bagg for building, corner of Peel and St. Catherine streets, $60,000.

The principal losers in the fire of May 5th are the Canada Furniture Company and the Ives Modern Bedstead Company. Estimated total loss, $70,000.

An extension is being made to the C. P. R. Angus shops to be used for building and repairing locomotive tenders. The addition is 160 feet long, 116 feet wide, and 35 feet high, and adjoins the boiler shop.

Plans and specifications are being prepared by Messrs. Lockwood Green & Co., of Boston, Mass., for a five-storey reinforced concrete building for manufacturing purposes for the Gillette Safety Razor Company, Limited. This factory will have a frontage of 105 feet on St. Alexander street and a depth of 75 feet.

Messrs. Nobbs & Hyde are the architects for the large new office and manufacturing building to be erected for Messrs. Henry Birks & Sons, Limited, at the corner of Cathcart street and Union avenue.

Mr. Carl Rosenberg is preparing to erect a five-storey building with terra cotta front on St. Lawrence Boulevard. The plans are being prepared by Mr. C. Bufort.

North Bay, Ont.

Trout Lake Hotel near here was destroyed by fire on the 7th inst. Estimated loss, $15,000.

Ottawa, Ont.

It is announced that W. C. Edwards Company will erect a branch planing mill near Westboro.

Owen Sound, Ont.

The by-law to grant civic privileges for the Knitting Factory was carried. Messrs. Lake & Ward are interested; that for the Adams Furniture Company, of Toronto, was carried; also that for the S. Lloyd & Company, of Toronto, towards the erection of a factory to manufacture children's carriages and wagons.

Ponoka, Alta.
The Wetaskiwin Produce Company will build a warehouse.

Penticton, B.C.
Daniel Williams will erect a harness factory.

Port Arthur, Ont.
A new match factory is contemplated for this city costing $70,000. Mr. McArthur, of the Dominion Match Company, Deseronto, is interested.

Mr. Jack McRae, local contractor, double the capacity of his plant so as to include the manufacture of hardwood flooring, sashes and doors.

Regina, Sask.
Tenders addressed to J. G. Sullivan, assistant chief engineer C. P. R., will be received until May 17th for erection of stone station here. Plans, etc., at office of the division engineer at Moose Jaw and at the office of the above.

Storey & Van Egmond, architects, have prepared plans for the new 5-storey warehouse for the B. F. Ackerman & Company. It is understood that Parsons Construction Company will get the tender.

Plans have been approved for construction of brick and stone office building for the Western Trust Company, excavating has commenced. The plans, which have been drawn by Sharon and Rarrach, call for a building five storeys in height. Tenders will be called shortly. Estimated expenditure, $75,000.

St. Catharines, Ont.
The Buffalo Brake Beam Company will locate their Canadian branch here. President, S. A. Crone, Industrial Commissioner, Mr. Brunnell.

Swift Current, Sask.
Excavation has commenced on the site for the new 3-storey hotel to be erected for Wm. Drever, of the Alexandria Hotel, Regina. Estimated cost, $60,000.

Sydney, N.S.
It is understood here that Sydney, N.S., has been chosen as the site for the naval building plant. Messrs. John Brown and the Fairfield Company are said to be interested.

Tenders addressed to P. D. Macneil, manager, will be received until May 12 for erection of new building for the Sydney Daily Post.

Saskatoon, Sask.
Frank P. Martin is the architect and supervisor of construction for the new Queen's hotel, on which building operations will be commenced shortly. Estimated cost, $200,000.

A large warehouse will be erected in the new Cordage park. R. J. Upton, local manufacturers' agent is interested.

The Merchants Bank has purchased a site on Second avenue. It is reported that a branch will be erected there in the near future. F. Pike, local manager.

Campbell, Wilson & Adams, wholesale grocers, intend erecting a large three-storey warehouse on a space 75 feet by 110 feet. Although they are only contemplating the erection of a three-storey structure at the present time, it is understood the foundation is being laid with a view to carrying six storeys at some future date. Mr. Adams, local manager.

It is understood that the National Drug Company, of Montreal, have purchased several lots where they purpose building a fine large structure, and that both the Miller-Morse people and the Hart-Parr Company have in mind the establishment of wholesale branches in this city.

Toronto, Ont.
Tenders are called until May 17th for erection of large office and warehouse building for the James Robertson Co., Ltd., s.w. corner of Spadina avenue and Sullivan street. Plans, etc., at office of Messrs. A. R. Denison & Stephenson, architects, 20 King street west.

Victoria, B.C.
The city solicitor advises that no by-law or regulation can prevent the erection of the proposed hotel by Thos. Potter opposite the new George Jay school. Estimated cost, $15,000.

Vancouver, B.C.
The tenants on the property on which the new 10-storey block for Ald. Rogers is to be erected, have been given notice to vacate by June 1st, when work will probably commence. Estimated cost, $500,000.

The C. P. R. are understood to be considering the erection of an 8-storey block on the site where the present city telegraph offices stand. Estimated cost, $200,000.

Winona, Ont.
Mr. L. A. Roy, of Chicago, it is reported, is making arrangements for erecting a $50,000 cooling plant here.

Wakefield, Que.
McLaren Bros. will rebuild their grist mill recently destroyed by fire, at an estimated cost of about $75,000.

Winnipeg, Man.
Permit was issued to J. H. Ashdown for warehouse, corner Rory and Bannatyne, $73,000. J. H. G. Russell, architect; P. Burnett, contractor.

Tenders are called until May 13th for erection of brick business and apartment block for C. A. L. Fish, corner of Main street and St. John avenue. Plans, etc., with Glines & Co., 301 Northern Crown Bank building, Portage avenue.

It is officially announced that the Hudson Bay Company will erect the department store on Portage avenue, bounded by Vaughan street, Colony street and St. Mary's avenue. H. E. Burbridge, commissioner.

A building site has been secured for the Canada Cement Company's plant, two miles south of Oak Point Junction, and construction, it is stated will begin this summer.

Yorkton, Sask.
[illegible] will probably be commenced shortly; estimated expenditure, $50,000. J. S. [illegible]

AWARDED

Calgary, Alta.
The contract for erection of the block for the late Judge Travis has been awarded to R. A. Brocklebank.

Chatham, Ont.
The Blonde Lumber & Mfg. Co. have been awarded the contract for the building for the American Pad & Textile Co., head office, Greenfield, Ohio. Estimated cost, $41,500. The building will be of concrete from footings to grade line and ruble masonry from grade line to floor line from this point two storeys high of brick work, including parapets. The construction generally is slow-burning wood with reinforced concrete floors.

Montreal, Que.
Messrs. Marchand & Haskell are the architects and Mr. E. S. M. Cape the contractor for a factory to be erected at the corner of Duquette and Chambly streets for Ramsays Limited at a cost of $27,000. The construction will be of Laprairie brick on stone and concrete foundation.

The George A. Fuller Company, Limited, have been awarded a contract for the excavation work for the new Carleton Hotel to be erected on Sherbrooke street west. The excavation is to go down about 28 feet below the sidewalk level. This work is to be completed by the middle of July. Some modifications have been made in the plans for the hotel which it is expected will contain about 200 rooms and is to be ready for occupation in September, 1912. The contract for the superstructure is likely to be given out within two or three weeks.

Messrs. John Stewart & Co. have been awarded contract for the erection of a three-storey brick store at the corner of Peel and St. Catherine streets. The building will be entirely fireproof and will cost about $60,000.

Nelson, B.C.
The contract for erection of jam factory has been awarded to Waters & Pascoe. A. Carrie, architect. Estimated outlay, $15,000.

The contracts for the completion of the Kerr block have been awarded as follows: the stone work having already been practically finished by Eric Palmquist; carpenter work, Waters & Pascoe; plumbing, B. C. Plumbing Co.; the roofing, Wood-Vallance Hardware Co.; painting and kalsomining, W. S. Pearcy; plastering, T. Brenilson; and the wiring for telephone and electric lighting, F. W. Steel & Co, $60,000. A. Carrie architect.

Winnipeg, Man.
The contract for the Canada Fairbanks building has been awarded to Messrs. G. H. Archibald & Co., general contractors, Montreal. The construction will be brick with terra cotta [illegible]

[illegible] & Brockest has been awarded to John [illegible]

Welland, Ont.
[illegible]

(Continued on page 60)

Tenders and For Sale Department

CITY OF MOOSE JAW
Saskatchewan

Incinerator Plant

Sealed proposals endorsed "Incinerator Plant" will be received by the City of Moose Jaw addressed to the undersigned City Clerk until 8.30 o'clock p.m., on **Monday, 22nd May, 1911.**

The proposals received may cover alternative designs and methods but in any case the plant shall be capable of handling 25 tons per day and provision made for generation of steam.

The price bid shall include the supply of all materials for and the complete construction of the plant, same to be turned over to the Corporation in satisfactory working order.

Satisfactory guarantees shall accompany each tender.

The lowest or any thender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.

Moose Jaw, April 24th, 1911. 18-20.

PORT HOPE

Tenders

For Concrete Sidewalks, etc.

The Corporation of Port Hope invite Tenders for the construction of five lineal miles, or thereabouts, of Concrete Sidewalks and Crossings, with the necessary works connected therewith, in accordance with detail and specifications prepared therefore, copies of which, with forms of tender, may be obtained on application to the undersigned. A marked cheque equal to five per cent. of the gross amount of the contract to be furnished with each tender, and the lowest tender not necessarily accepted. Tenders will be received to noon, **15th May, 1911.**

J. W. SANDERS,
Town Clerk.

Dated 19th April, 1911. 17-19

CITY OF TORONTO

Tenders

For Construction of Ashbridge Bay Docks

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on **Tuesday, 23rd May, 1911**, for the construction of dock in Ashbridge Bay.

Envelopes containing tender must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained upon application to the Department of Railways, Bridges and Docks, City Engineer's Office, Toronto.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman, Board of Control.

City Hall, Toronto,
April 12th, 1911. 17-19

Bucket Crane

FOR SALE One full circle, self-propelling, modern 10 to 15-ton capacity Browning size No. 1 Locomotive Crane, standard gauge, 4-wheel truck, 38 ft. steel boom, 8 x 10 engines, equipped to handle Clam or Orange Peel. Will furnish with or without bucket. Attractive price, fine condition, quick delivery. Inspection here.

WILLIS SHAW MACHINERY CO.
c 39 So. LaSalle Street, Chicago.

CITY OF MOOSE JAW
Saskatchewan

Storm Sewer Extensions

Sealed tenders endorsed "Contract 32 or 33" will be received by the City of Moose Jaw addressed to the undersigned City Clerk until 8.30 p.m. on **Monday, May 22nd, 1911.**

Any tender received after the above stated time will be declared informal.

Contract 32.—The laying of approximately 9,000 lineal feet of Storm Sewer and 2,300 lineal feet of Catch basin connections and builidng manholes, catch basins, etc.

Plans and specifications may be seen at the City Engineer's office.

Contract 33.—The supply of approximately: 7,900 lineal feet of 10-in. Vitrified Tile Pipe; 1,100 lineal feet of 8-in. Vitrified Tile Pipe; 2,300 lineal feet of 6-in. Vitrified Tile Pipe, also junctions, bends, etc.

Specifications may be obtained from the City Engineer's Office upon application.

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.

Moose Jaw, April 29th, 1911.

For Sale or Exchange

Municipal Pumping Plant Deseronto, Ontario

Tenders will be received by the undersigned up to noon of **June 4th, 1911**, by the Corporation of the Town of Deseronto, for the sale of the following equipment:

One 75 h.p. Fairbanks-Morse Suction Gas Producer.

One 65 h.p. Fairbanks-Morse Vertical Producer Gas Engine.

One 12 x 15 Triplex Pump, direct connected by friction clutch to Gas Engine, capacity 1,000 gallons per minute.

The above equipment has only been operated a short time and is in first-class condition. Changing to hydro-electric power necessitates disposing of above equipment. Plant is offered complete as above or separately, or would consider an exchange for equal capacity rotary pump and motor.

Specifications and dsecription of above equipment furnished on application to the undersigned or can be seen at the offices of the Contract Record, B34 Board of Trade Building, Montreal, and 441 Seymour street, Vancouver, B.C.; or at the office of the Canadian Engineer, 62 Church street, Toronto, or 404 Builders' Exchange, Winnipeg.

LUCIUS E. ALLEN,
Consulting Engineer,
18-20 Belleville, Ont.

TENDERS FOR CLUB BUILDING

Bulk tenders, or tenders for the several trades required, will be received by the undersigned, up to **May 15th next (1911)**, at 6 o'clock p.m., for the erection of a club building, for the Galt Club, Limited, on Dickson Street, Galt, Ontario, according to plans and specifications which may be seen at the office of the Secretary, Gore Building, Galt, or Stewart and Witton, architects, Hamilton.

The Club do not bind themselves to accept the lowest or any tender.

M. A. SECORD, Secretary,
18-19 The Galt Club, Limited.

Tenders for

Bridge and Abutments

Tenders will be received by the undersigned up to noon, **May 27th, 1911,** at Arkwright P.O., for the erection of two concrete abutments, and one span Baltimore truss of 100 ft. span, over the Sauble River, about two miles from Tara.

Abutments to be completed by the 15th of July, and the superstructure to be completed by the 15th of August, 1911. An accepted cheque for $100, payable to the Treasurer, Township of Arran, must accompany each tender. Tenders to be opened at Arkwright at 2 p.m., May 27th, 1911.

The lowest or any tender not necessarily accepted.

(Signed) JOHN H. WILES,
Reeve Arran.

Arran, May 1s,t 1911. 18-19

SUPPLY OF
72-inch Steel Pipe

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on **Tuesday, May 23rd, 1911,** for the supply of between three thousand and three thousand five hundred feet of steel pipe, seventy-two inches in diameter, for the Waterworks Intake.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Tenderers shall submit with their tender the names of two personal sureties, approved by the City Treasurer, or in lieu of said personal sureties the bond of a Guarantee Company, approved as aforesaid.

Plans and specifications may be seen and Forms of Tender obtained from the Waterworks Department at the office of the City Engineer, Toronto.

The usual conditions relating to tendering, as prescribed by City By-law, must be strictly complied with, or the tender will not be entertained.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman of Board of Control.

City Hall, Toronto, May 3, 1911. 19-19

Tenders Wanted

Bulk or separate tenders for the masonry, carpentry, roofing, plastering and painting in connection with the erection of the Neal Memorial Church at Port Rowan, will be received by J. W. Schofield, Port Rowan, until **May 18th, 1911.**

Plans and specifications may be seen at the office of J. L. Buck, Port Rowan, or W. D. Chown, architect, 75 Yonge street, Toronto.

The lowest or any tender not necessarily accepted. 19-19

Province of Quebec
Municipality of Lachute Town

TENDERS
For Cast Iron Water Pipes

Sealed tenders addressed to the undersigned and endorsed "Tenders for Pipes," will be received until noon of **Monday, May the 22nd,** for about 280 tons of 8-inch cast iron water pipes. Specifications prepared by Wm. Kennedy, Jr., C.E., may be obtained from the undersigned.

J. W. RAITT,
Town Clerk and Secretary-Treasurer.
Lachute, Que. 19-19

Notice

Tenders for the construction of ten (10) small cement abutment, cement floor and steel beam bridges, will be received by the council of the Township of Hay, up to **Monday, the 22nd day of May,** at two o'clock p.m. Also for cleaning out "Schwalm" Drain and "West Branch South" Drain. Engineer's estimate on the Drains, $1,237.

Particulars may be obtained and plans and specifications seen at the office of the undersigned.

The lowest or any tender not necessarily accepted.

FRED HESS, Sr., Clerk,
19-19 Zurich, P.O.

Zurich, Ont., May 4, 1911

City of Toronto

Tenders for the Construction of Turner's Bath Bridge

Tenders will be received by registered post only, addressed to the chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on **Tuesday, 30th May, 1911,** for the construction of a steel and concrete bridge at Turner's Baths, Hanlan's Point, Toronto Island.

Envelopes containing tender must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained [illegible] Railways, Bridges and Docks, City Engineer's Office, Toronto.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman of Board of Control.

City Hall, Toronto, May 6, 1911 19-20

Tenders
For
Bridge Piers and Abutments

Tenders will be received at the office of the City Commissioners up till 3 p.m., **May 29th, 1911,** for the construction of the Piers and Abutments for bridge over the Saskatchewan River. Plans and specifications may be seen and all information obtained at the office of the City Engineer. Lowest or any tender not necessarily accepted.

CITY COMMISSIONERS.
A. J. LATORNELL, City Engineer.

Edmonton, April 29th, 1911. 19-20

BOARD OF EDUCATION

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board will be received until

FRIDAY, NOON, MAY 12th, 1911

FOR

Enlargement of Earlscourt School

AND

Enlargement of Annette Street School

Plans and specifications [illegible] information obtained at the office of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in said specifications and forms of tender.

The lowest or any tender will not necessarily be accepted.

W. W. HODGSON,
Chairman of Committee.

W. C. WILKINSON,
19-19 Secretary-Treasurer.

Tenders for the Erection of an Addition to the Administration Building upon the Exhibition Grounds

Bulk tenders will be received by the undersigned by registered post only up to noon of **Tuesday, May 16th,** inst., for the various trade works in connection with the erection of an addition to the Administration Building upon the Exhibition Grounds.

[illegible] forthwith at the office of George W. Gouinlock, [illegible]

[illegible]

[illegible]

[illegible]

City Hall, Toronto, May 8, 1911 19-19

To Contractors

Sealed tenders addressed to either of the undersigned will be received until noon on **Saturday, the 20th instant,** for building concrete abutments and concrete floor for the Club Bridge over Black Creek on the town line between Moore and Sombra. Plans and specifications may be seen at the residence of J. T. Whitside, Courtright, or at the residence of Neil McGugan, Wilkesport, or at the office of Bell & McCubbin, Engineers, St. Thomas. A marked cheque must accompany tender as specified. The lowest or any tender not necessarily accepted. The committee will open tenders in the Village of Sombra on Monday, 22nd instant, at 3 o'clock p.m.

NEIL McGUGAN,
Wilkesport, Ont.
J. T. WHITSIDE,
19-20 Courtright, Ont.

CITY OF MOOSE JAW
Saskatchewan

Paving and Sidewalks

Sealed tenders endorsed "Contract 34 or 35," will be received by the City of Moose Jaw addressed to the undersigned City Clerk until 8.30 p.m. on **Monday, May 29th, 1911.**

Any tender received after the above stated time will be declared informal.

Contract 34.—The laying of approximately 41,093 square yards of pavement.

Contract 35.—The laying of approximately 206,061 square feet of concrete sidewalks and 46,366 lineal feet of curb and gutter, also 1,056 square yards of Wood Block Crossing.

Specifications may be obtained from the City Engineer's Office upon application.

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.

Moose Jaw, May 4, 1911 19-20

TOWN OF ROULEAU

Sealed Tenders

Sealed tenders, endorsed "Tender A.," "Tender B.," "Tender C.," will be received by the undersigned Secretary-Treasurer, up till 8.30 o'clock on **Monday, May 29th, 1911,** for the undermentioned.

Any tender received after the above stated time will not be considered and the Corporation reserves the right to reject any or all tenders.

An accepted cheque equal to 5 per cent. of the amount of the tender must accompany each tender, and envelope must be endorsed with the letter of the contract referred to.

Tender A. Trenching, laying steel water mains, hydrants, valves, etc., and back filling.

Tender B. Constructing reinforced concrete reservoir.

Tender C. Erecting brick power house.

Plans and specifications can be seen at the [illegible] plans.

[illegible]

J. DARLINGTON WHITMORE,
[illegible]
Regina, Sask. 19-19

Sealed tenders addressed to the undersigned, and endorsed "Tender for Gordon Creek Dam, Kippewa Village, Que.," will be received at this office until 4 p.m., **Monday, May 29, 1911**, for the construction of a Dam and Sluiceway across the Gordon Creek at Kippewa Village, in the County of Pontiac, Que.

Plans, specifications and form of contract can be seen and forms of tender obtained at this Department at the office of J. E. Sing, Esq., District Engineer, Confederation Life Building, Toronto, Ont., and on application to the postmaster at Haileybury, Ont.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation, and place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, payable to the order of the Honorable the Minister of Public Works, equal to ten per cent (10 p.c.) of the amount of the tender, which will be forfeited if the person tendering decline to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,

R. C. DESROCHERS,
Secretary.

Department of Public Works,
Ottawa, April 25, 1911.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 19-19

Sealed tenders addressed to the undersigned and endorsed "Tender for Public Building, Seaforth, Ontario," will be received until 4 p.m., on **Monday, May 29, 1911**, for the construction of a Public Building at Seaforth, Ont.

Plans, specifications and form of contract can be seen and forms of tender obtained at the office of Mr. H. J. Lamb, District Engineer, London, Ont., at the post office, Seaforth, and at this Department.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation, and place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, payable to the order of the Honorable the Minister of Public Works, equal to ten per cent. (10 p.c.) of the amount of the tender, which will be forfeited if the person tendering decline to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,

R. C. DESROCHERS,
Secretary.

Department of Public Works,
Ottawa, May 1, 1911.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 19-20

Tenders Wanted

Tenders will be received by the undersigned until 5 p.m. on **Saturday, May 20th**, for the various works required in the erection and completion of a large building for Sabbath School and Church Parlor purposes for the Presbyterian Church, Orillia, Ont. Plans and specifications can be seen at the offices of the architects, and also at the offices of Mr. Robertson, architect, Orillia. The lowest or any tender will not necessarily be accepted.

GORDON & HELLIWELL, Architects,
525-7 Confederation Life Building,
Toronto

19-19

Tenders Wanted

Tenders for repairing and enlarging the Tank of the Niagara Waterworks System according to plans and specifications which may be seen or had by applying to the undersigned or to F. W. Paulin, C.E., Niagara Falls, Ont., will be received to 8 p.m., **Tuesday, May 23rd, 1911**.

Envelopes must be sealed, and marked "Tenders for Repairing and Enlarging Tank."

The Council do not bind themselves to accept the lowest or any tender.

W. E. LYALL,
Clerk.

Niagara-on-the-Lake,
May 5th, 1911. 19-20

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

POSITION WANTED—As Superintendent or walking boss on railroad or other construction work, by experienced man who can furnish excellent references. Apply Box 271, Contract Record, Toronto, Ont.

Miscellaneous

Advertisements under this heading two cents per word per insertion.

Large European concern manufacturing water turbines, centrifugal pumps and steam turbines, wants to be represented in Winnipeg and Vancouver by well-known qualified and experienced firm. Box 265, Contract Record, Toronto, Ont.

Power Plants, Electricity and Telephones

Berlin, Ont.
A $20,000 electric light by-law will be voted on by the ratepayers on May 31st, also $7,900 by-law for street railway.

Calgary, Alta.
C. H. Mitchell, of Toronto, will make a definite report to the government on the water supply in the Bow and Elbow rivers and also on the power available.

Cochrane, Ont.
The franchise for telephone service here has been given to W. J. Bouldry. Work will commence at once.

Montreal, Que.
The National Hydro-Electric Company has been incorporated, capital, $1,000,000. H. Miles, president; L. Gosselin, secretary. Carillon Falls, on Ottawa river, 35 miles from Montreal, will be the source of the power.

Melville, Sask.
By-laws for the construction of waterworks, electric light and storm sewer have been carried by the ratepayers.

Tenders are called until May 25th for supply of the following machinery and materials for delivery during current season: Two 50 k.w. generators; two exciters for same; three 2,300 volt a.c. motors; 1 marble switchboard, etc.; 300 cedar poles; 3 tons copper wire; 10 lighting transformers, 2,300-110 volt; series street lighting system; two 3-stage turbine pumps; one 6-in. vertical submerged type centrifugal pump, with shafting and piping; about 3 tons of 10-in. standard c. i. water pipe; about 60 tons of 8-in. standard c. i. water pipe; about 200 tons of 6-in. standard c. i. water pipe; about 25 tons of 4-in. standard c. i. water pipe, special castings for all above sizes; 4-in., 6-in. and 8-in. gate valves and valve boxes; 44 fire hydrants; about 17,000 lbs. of pig lead; about 1,000 lbs. of oakum; 400 ft. of 8-in. wood pipe. Information obtained from John Crow, secretary-treasurer.

Port Arthur, Ont.
On May 29th two by-laws will be voted on, one for $25,000 street railway purposes, and the other for $15,000 floating debt.

Penetanguishene, Ont.
The by-law to raise by debentures $27,000 for the municipal hydro-electric power system was carried. Of this $10,500 will be used for extensions and improvements.

Victoria, B.C.
The city will purchase sufficient standards to commence the installation on those streets already passed for the present type of standard. Tenders will be called for a large number of other standards both of the present type and of the New Westminster type, which latter is favored ont only on account of the design, but also on the score of cost, the New Westminster standard costing some $24 less than that now in use here.

South Qu'Appelle, Sask.
The Electric Light Company here contemplate erecting a more substantial power house, and also installing gasoline power. L. G. Bell, sec.-treas., board of trade.

St. Thomas, Ont.
It has been decided to recall the proposed by-law for $35,000, for the renovation of the street railway system.

Winnipeg, Man.
Tenders are called until May 12th for supply of copper wire, galvanized iron wire, insulators, cross arms and top pins, mast arm parts, cut-outs, hardware and miscellaneous materials. M. Peterson, secretary, board of control.

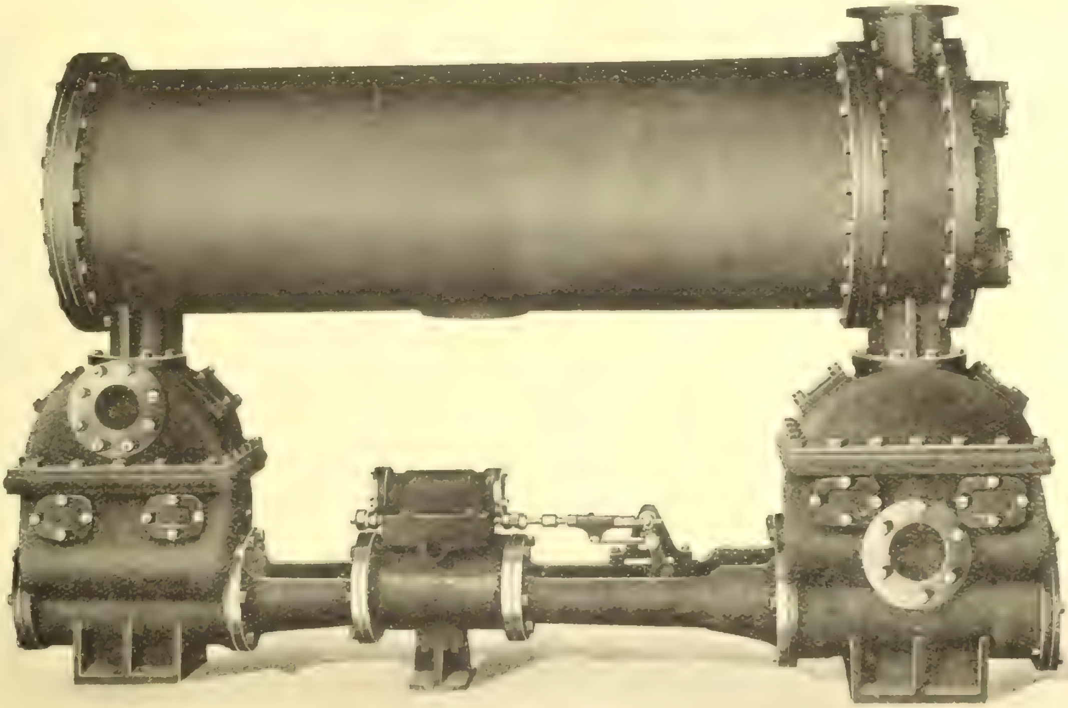
Tenders addressed to chairman, board of control, will be received until July 3rd for supply of apparatus and materials required for installation of police patrol telegraph system. Specifications, etc., at office of F. A. Cambridge, city electrician; M. Peterson, secretary.

AUTOMATIC SASH HOLDER

saves cord, weights, pulleys, and materials—no pockets—easier to install—for old and new windows. Send for sample and catalogue to-day. Agents wanted. Sold by the hardware trade or direct from 277 Broadway, New York.

Automatic Sash Holder Company

Condensors



Condensor built by The John Inglis Co., Limited.

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

Let us Submit Prices.

The John Inglis Company Limited
Engineers and Boilermakers
14 Strachan Ave., TORONTO, Canada

WHEN YOU THINK OF METAL CEILING THINK OF "GALT"

"Galt" Art Metal Ceilings are sold strictly on their merits, their **mechanical superiority** and faithfulness to art in styles they typify.

Machine-cut beads (patented process) make them easy to apply. Plates snap into place and seams fit snugly together. Why waste your time puttying and peening the joints on old-fashioned stuff when the new is here and costs less?

Write us about your Metal Ceiling work

THE GALT ART METAL CO.,
GALT - ONT.

For efficient and economical

Weather and Waterproofing

use

Kiton

The Coal Tar which is soluble in water (but once only)!

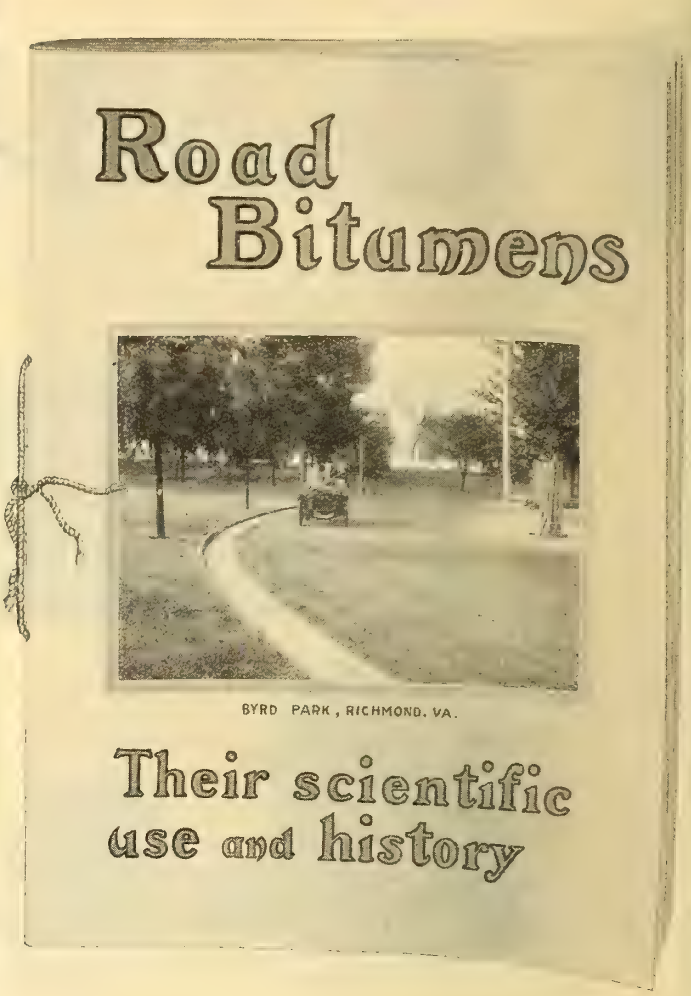
It can be applied everywhere, to anything, even to

Wet and Cold Walls

No Tar Kettle! No Fire! No Waste!

For information write to

F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.



Road Bitumens

BYRD PARK, RICHMOND, VA.

Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a phamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

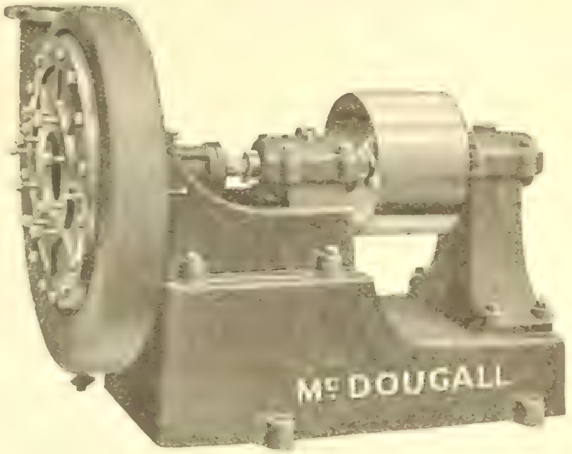
Send for the Book

Good Roads Improvement Company
First National Bank Building
CINCINNATI

Centrifugal Pumps

Built from the designs of our consulting engineer, Mr. W. C. Brown, formerly chief engineer for Henry R. Worthington, New York.

The illustration shows one of 15 pumps of different types built for the Powell River Paper Company. It has a capacity of 1,000 gals. per min., against a head of 50 feet.



Works:
512 William Street, Montreal

Sales Offices:
Montreal, Toronto, Cobalt, Winnipeg, Calgary, Vancouver

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.
LIMITED

WATER - POWER PLANTS LOW PRESSURE TURBINES

ANY OUTPUT

ESCHER WYSS & CO.

Water Power Engineers
Works: Zurich, Switzerland

CANADIAN OFFICE:

Toronto: Lumsden Bldg., R. 408

Cablegrams: Neumuehle, Toronto
Phone Adelaide 234, Toronto

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

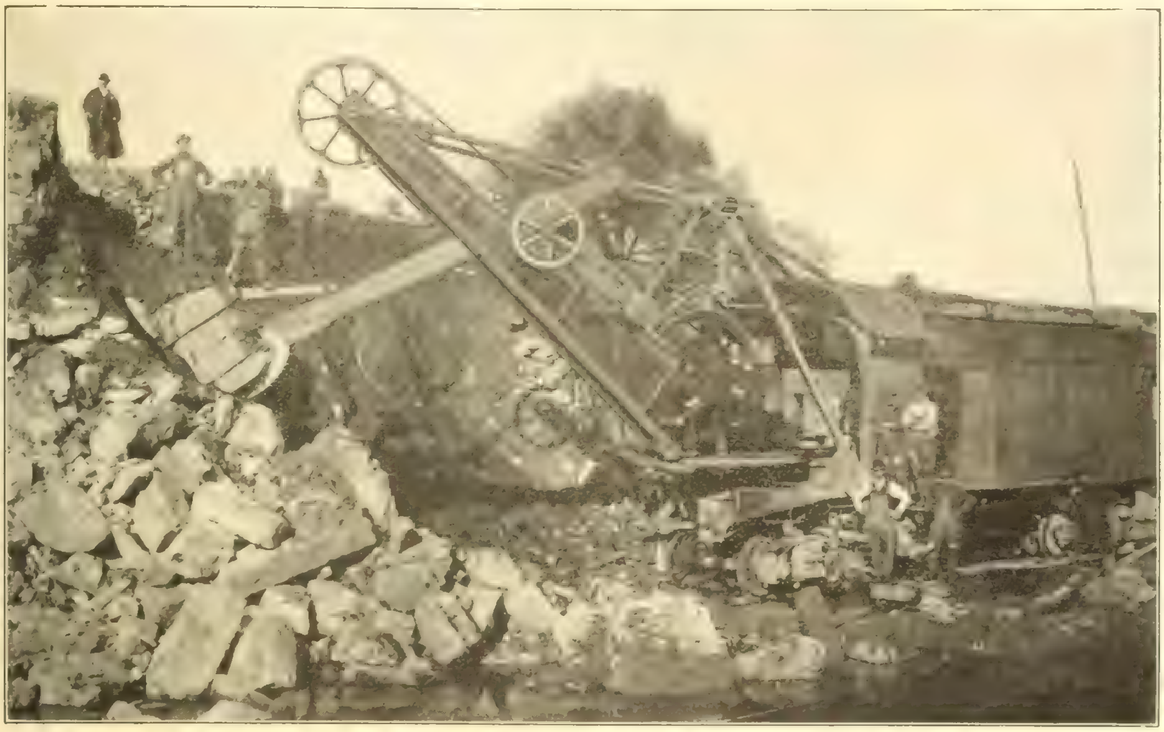
The Roman Stone Company
Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal



CLASS 45-16-2½ ATLANTIC SHOVELS, BUILT FOR EDGAR S. AND L. W. READE, CONTRACTORS
At Work on the Construction of the Canadian Light and Power Company's Canal at Valleyfield, Quebec, Canada.

BUILT BY
MONTREAL LOCOMOTIVE WORKS, LIMITED.

Atlantic Steam Shovels are built by the Montreal Locomotive Works, Ltd., at Montreal, Canada, They are not built as steam shovels have always been built, but are designed to do more work for less cost. Every feature is established by experience and every improvement known to be correct in principle has been applied after demonstrating its value in actual practice.

Atlantic steam shovels have direct wire rope hoist. Rope is as strong as chain and wears nearly as long, sometimes longer. It is far safer and does not break without giving warning. It is replaced in one-third the time required for renewing or repairing a chain. Furthermore, having warning of wear, it may be replaced out of regular working hours before breakage, and therefore without interrupting the work. Direct wire rope hoist requires one sheave, and that a large one, instead of the five to seven small sheaves chain shovels require. Every sheave means additional friction and additional parts to maintain.

WE HAVE FIGURES TO PROVE

that the direct wire rope hoist saves in cost of maintenance, in cost of fuel and in increased yardage. We cannot afford to use any but the best materials. Our engineers and our laboratories are kept busy testing everything we use.

Our resources, knowledge and experience in engineering and in manufacturing stand back of the product.

You cannot afford to purchase a steam shovel without investigating the Atlantic. Remember that even a fraction of a cent per yard means increased net earnings on a contract. Write us.

Atlantic steam shovels are built on the interchangeable plan. Every part is made in jigs or to gauges, and every repair part is sure to fit. Stocks are always available at our Works at Longue Pointe, Montreal.

MONTREAL LOCOMOTIVE WORKS, LIMITED
41 OTTAWA BANK BUILDING, MONTREAL, CANADA

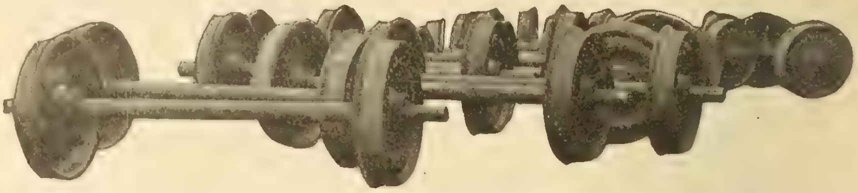
RAILWAY CONSTRUCTION PLANT

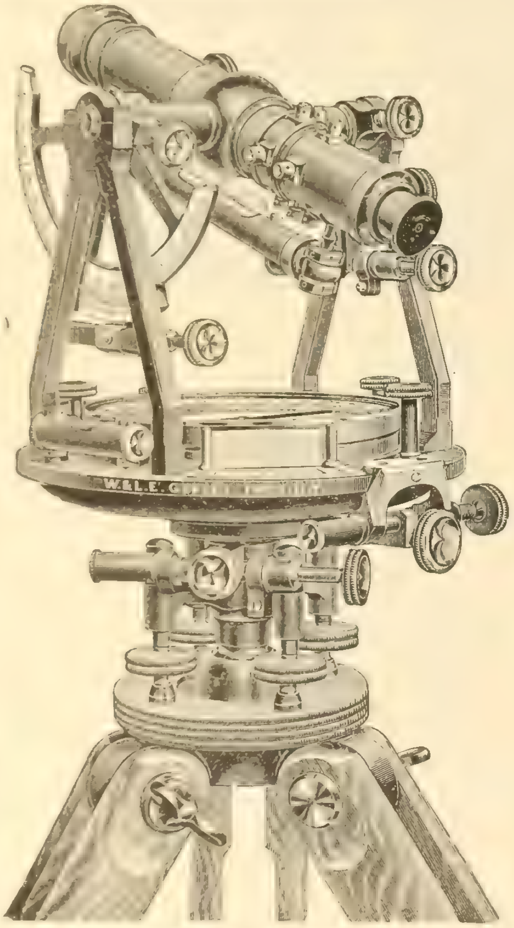
Hoisting Engines, Horse Powers, Hand Winches, Derricks, Car Wheels, Axles and Boxes, Dump Cars, Rail Cars, Buckets

MARSH & HENTHORN, Limited
Makers of Hoisting Machinery, BELLEVILLE, ONT.

Send for Catalogue

SALES AGENTS
MUSSENS
LIMITED
Montreal, Que.




W. & L. E. GURLEY TROY

1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic
Engineers and Land Surveyors

Transits
Y Levels
Compasses
Plane Tables
Current Meters
Levelling Rods
Chains
Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

ORNAMENTAL
IRON WORK
WIRE CLOTH AND
WIRE GOODS

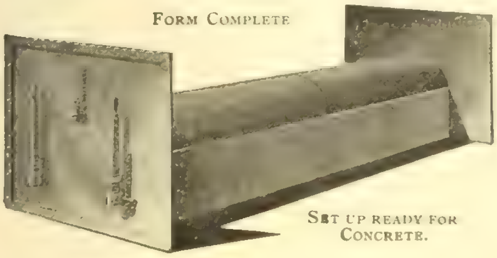
Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES
Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.



Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

WRITE FOR FORM CATALOGUE
ENGINE CATALOGUE FOR THE ASKING
COMMISSIONER'S TIME BOOK FREE

Concrete Form & Engine Co.

Successor to Collapsible Steel Form Co.

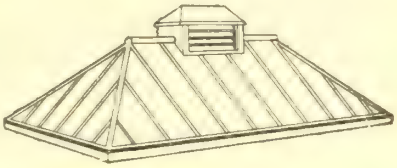
83 Congress St., W., Detroit, Mich.

"A work ill done must be twice done—only the best gives satisfaction."

—The Philosopher of Metal Town.

Metallic Skylights

Are Practically Imperishable



The framework is of hollow metal, galvanized steel or sheet copper and when glazed with **wire glass** is **absolutely fireproof.** We make all shapes and sizes.

The exclusive features of "Metallic" Skylights make for permanency and absolute satisfaction. See that they are specified in contracts.

Information and prices on request.

Manufacturers

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Neptune Meter Co.

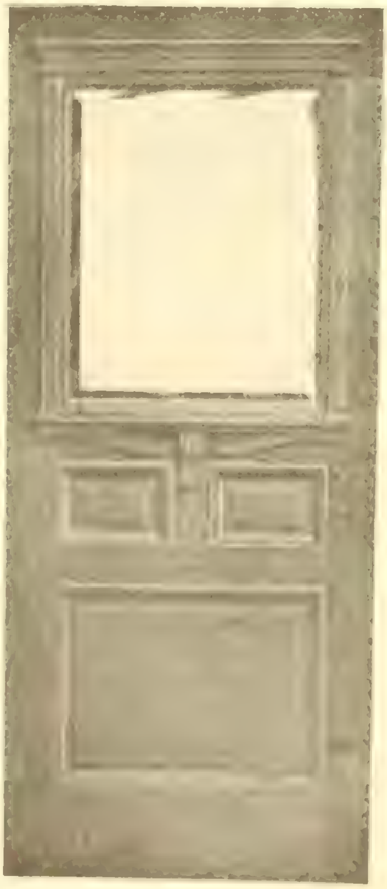
Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street

New York City



BRYAN DOORS

Noted for their Beauty and Durability

[illegible]

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario

Filing Plans

Engineers, Architects and Municipalities desiring to secure the maxium number of bids for contract work should file their plans and specifications at the offices of the Contract Record in Toronto, Montreal, Winnipeg and Vancouver.

Contractors and Manufacturers of contracting, building and engineering equipment have long recognized The Contract Record as the National Medium for advertising "Tenders Wanted" and not only expect to see your tenders advertised in this paper, but also to find your plans on file when they call at any of the offices.

This service is given to you without extra cost. Send along a set of plans and specifications with your next "Ad."

Contract Record

220 King St. W., Toronto

MONTREAL	**WINNIPEG**	**VANCOUVER**
Board of Trade Bldg.	Travellers Building	441 Seymour Street

WILSON BROS.

Hardwood Flooring and Interior Finish

"Wilson Bros. Limited" on flooring means a carefully kiln dried and well manufactured article. Our flooring is straightened, hollow-backed, bored, end-matched, steel polished and bundled. -:- -:- -:-

We specialize in Veneered Doors to detail.

Wilson Bros. Limited **COLLINGWOOD, ONT.**

The Mushroom System

Of Reinforced Concrete is strong, economical and durable. Based on scientific principles, every pound of steel does the work it is designed to do.

The system is fully covered by broad patents in Canada, the United States, and all civilized foreign countries.

For lists of buildings, descriptive literature and estimates, address

C. A. P. Turner, M. Am. Soc. C. E.
816 Phœnix Building, Minneapolis, Minn.

Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's New Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Sand & Supplies
LIMITED
Spadina Dock, Toronto

'Water-washed' & Gravel

Crushed Granite
Crushed Stone

Phone M. 4507
1217

Interior Finish
in
Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.
Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

"The best is cheapest"

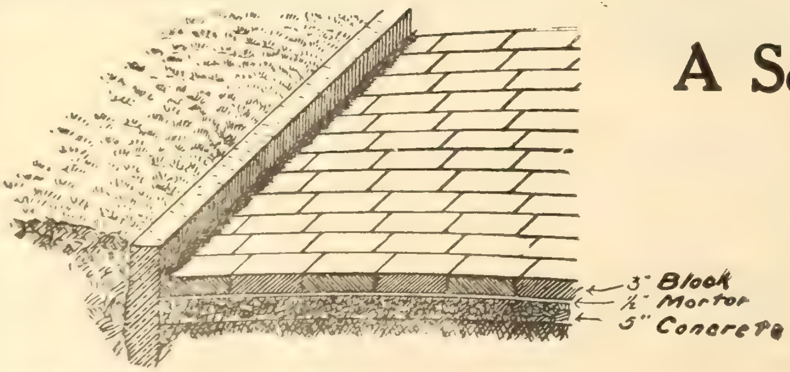
"Sanorto"
Composition Flooring

Guaranteed durable, jointless, noiseless; fire, water, insect and dust proof
For Churches, Hospitals, Hotels and all public buildings it is unequalled. Its use in private houses for bath rooms, kitchens, verandahs, etc, has always given the greatest satisfaction.
Our imitation marble is perfect. Testimonials on application Estimates on all classes of work free. Distance no object. Write for samples

The Sanitary Floor Co.
544-546 King Street West. - - Toronto, Ont.

EVERYTHING YOU WANT
in a Factory Site:

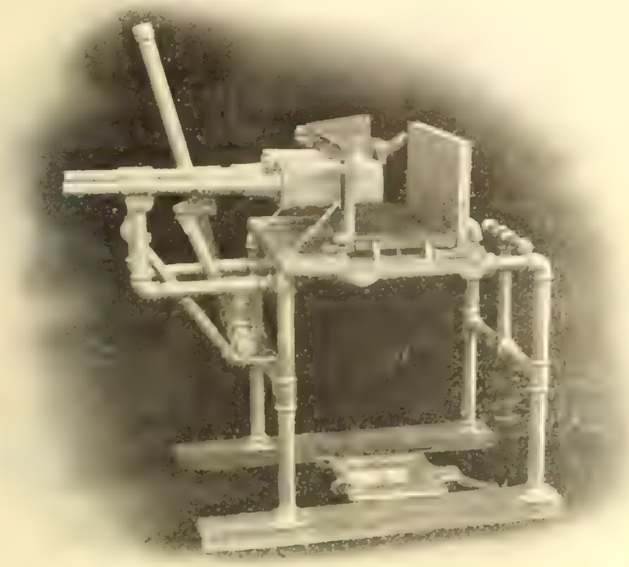
Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities
at
Maisonneuve, Que.



A Scientific Pavement
must be
Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

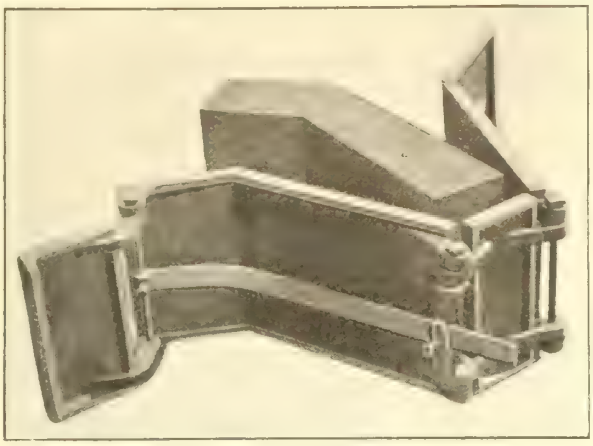
These requirements are met by
Asphalt Block Pavements
Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.



Block Machine No. I. **(End Door Removed)**

This machine is strong, simple, and what is more important it is the fastest outfit on the market, and you know time means money.



Famous Angle Mould

This mould will make blocks with any angle from 20 to 60 degrees in 8 or 9 inch height without having to change any parts other than for adjustment. A great many of these moulds have been sold.

Send for our Literature

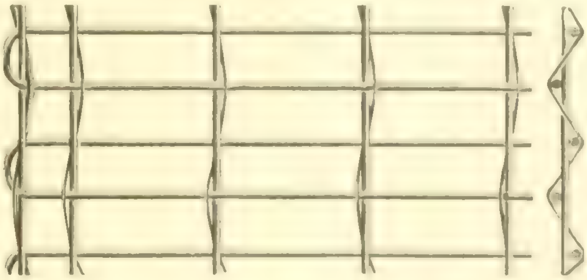
Famous Machinery Co., **21 Pitt Street W.**
WINDSOR, ONT.

LOW PRICES - HIGH QUALITY

QUICK SHIPMENT

Quality considered there is no wire lathing on the market cheaper than Greening's Wire Lathing. And our splendid, well-organized facilities and big output enable us to be unusually prompt in the shipment of large or small orders.

Greening's Trussed Wire Lathing



is a first-class plastering surface at the **Right Price.** It contains all the good features of a first-class metal Lath, and eliminates many objectionable features of other types. Supplied with Selvage Edge, which prevents cutting or scratching in handling, in rolls up to 100 yards, and in stock widths from 24" to 48". Other widths to special specifications.

Does not "wave" or "buckle" when unrolled and lathing may be nailed directly along studs, joists or sheathing without furring, preventing lapping and insuring lowest possible cost of erecting.

Write further details and Catalogue.

The B. Greening Wire Company, Limited
HAMILTON, ONT. - MONTREAL, QUE.

Jas. Dickson, Pres. Geo. T. Dickson, Vice-Pres.

Dickson Bridge Works Co.

Campbellford, Ont. Limited

Bridge over Spanish River at Massey, Ont.

Steel Bridges, Steel Buildings Roof Trusses

and other Structural Steel

Foundry and Machine Shop in connection.

Estimates on application

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue Hunter Buff and Blue Oolitic Limestone

The Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

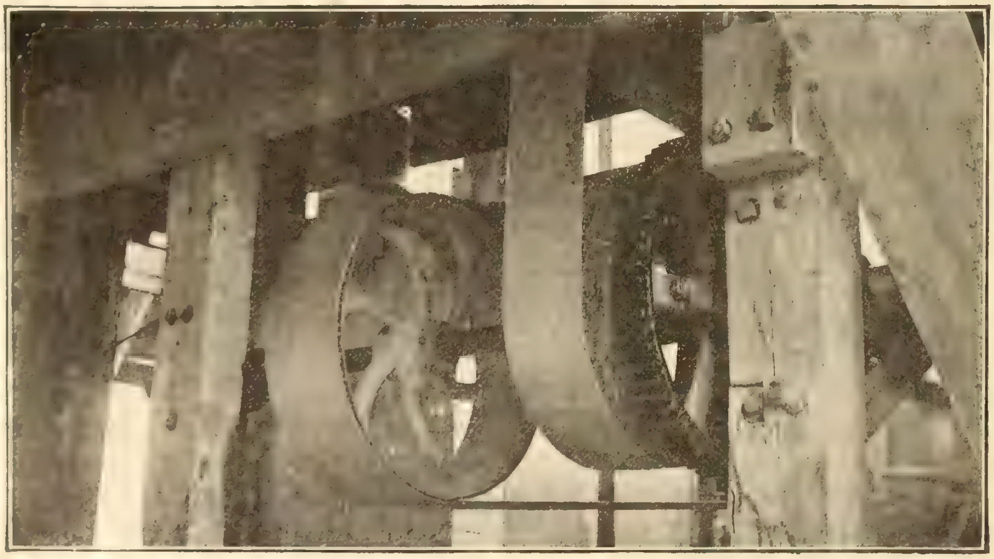
Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices

324-327 Monadnock Block - Chicago, Ill.

Toronto Agent

A. P. STEWARD - Builders' Exchange



This belt is running exposed to the weather and is subject to dust, heat and wet.

It is giving every satistion.

SCANDINAVIA BELTING

Federal Engineering & Supplies, Ltd.

284 Yonge St., TORONTO

329 St. James St., MONTREAL

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U.S.A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps, etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

---

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

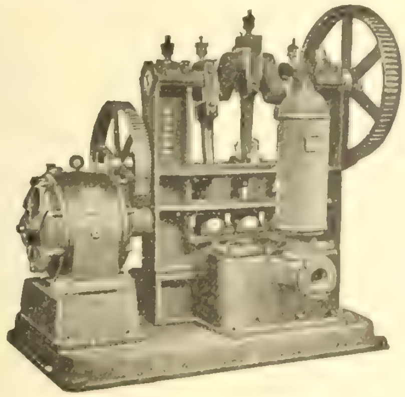
Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Goulds Efficient Power Pumps

Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

GOULDS QUALITY



Goulds Pump Co.

Coristine Building, **Montreal**
Phone Main 1054
Works: Seneca Falls, N.Y.

The Contractor's "Money Saver"

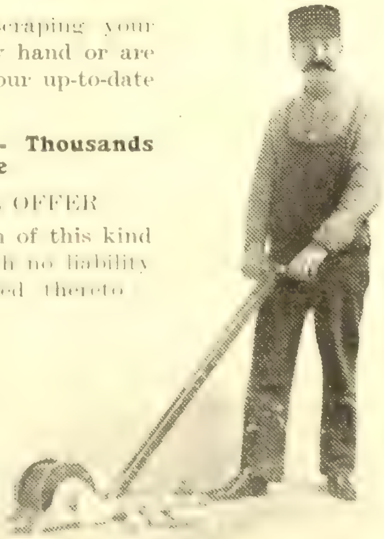
Are you still scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment --- Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to you with no liability or expense attached thereto write us **to-day.**

MACHINE
PAYS FOR
ITSELF
IN A FEW
DAYS



" Little Giant Floor Scraper "

Hurley Machine Co. Limited

Atlantic Avenue - Toronto

Improved Singer No. 4 Block Machine

Our catalogue K [illegible] information and prices on request

It Makes

Face Down Blocks

Blocks [illegible] 12", 16" and 24" long [illegible] 8", 10" and 12" [illegible]

All Blocks [illegible]

[illegible]

Vining Mfg. Co.
Niagara Falls, Ont

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Fre

[illegible]

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, CANADIAN EXPRESS BLDG., MONTREAL, Que.
[illegible]

The Tie that Binds

the wires in **PERFECTION MESH** for concrete reinforcement is a perfect attachment formed without heat or annealing. It is also splendid mechanical bond in the concrete.

PERFECTION MESH is the ideal reinforcement for spans up to eight feet. It's inexpensive too.

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

KAHN SYSTEM Reinforced Concrete

Flood your building with light by using

KAHN SYSTEM Reinforced Concrete

United Steel Sash

and thus increase the efficiency of your force.

Use Rib Metal Steel Mesh for reinforcing concrete floors and roofs. Our other products, include Kahn Truss Bars, Rib Bars, Hy-Rib and Trus-Con-Chemical Products.

Descriptive Literature and Estimates cheerfully furnished.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office:	Branches:	Agencies:
Walkerville	Toronto, Winnipeg, Montreal, Vancouver,	Quebec, Halifax.

COFFERDAMS
AND CONCRETE WORK

Cofferdam at Southampton; 40 feet x 12 feet, 14 feet deep.

We are experts at this work and before you close a contract, get our figures. We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

All International Varnish Products
are
Sold in full Imperial Measure Cans

That means more satisfaction and better goods for your customers at the same money.

Their satisfaction means trade insurance—A permanent clientele for you.

Many prominent architects are kind enough to say that all International Products are hall marked "Superior Quality."

Be that as it may, when you specify International Products your reputation is protected as far as the ingenuity and experience of any manufacturing concern can protect.

Secure our new album of Superior Finishes and judge for yourself.

Specify the following International Products in the contract:

Elastica	Satinette	Kleartone	Flattine
Floor Finish	"The Enamel that stays white"	Stains	Finishes

Full Imperial Measure is used in all packages

Made by

International Varnish Co., Limited
TORONTO WINNIPEG

A28

Lap Welded Steel Pipe

MADE IN SIZES

12 to 72 inches Diameter

Used extensively for Water Supply for Mines, Mills, Hydraulic Operations and High Pressure Hydro Electric Installations.

Ask our Welded Pipe Dept. for prices.

American Spiral Pipe Works

MANUFACTURERS OF

SPIRAL RIVETED PIPE LAP WELDED PIPE
FORGED STEEL FLANGES

50 Church St. New York Box 485 Chicago, Ill.

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)

"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."

W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.

1032 Garfield Building, CLEVELAND, OHIO

SELLING AGENTS

The Dominion Equipment & Supply Co., Winnipeg, Canada

HOW ABOUT IT

Just listen to the wonderful advantages of incorporating in your concrete

Guelph Hydrated Lime

1—The concrete works easier under the trowl.

2—It finishes easier.

3—It improves the color of the finished work.

4—It makes the Concrete more impervious to water.

5—It greatly improves the strength.

The above are not five fancy ideas but five established facts

Specify **Guelph Hydrated Lime** when ordering from your dealer.

Standard White Lime Co.

Guelph - Ontario

EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No 1—22 x 16 x 13 No. 2—27 x 16 x 13 No 3—33 x 22 x 18

Send for our illustrated booklet, it [illegible] Coal Chute.

The Down Draft Furnace Co., Limited

Galt, Ontario, Can.

The Meaford Wheelbarrow Co., Limited

MEAFORD, ONT.

Manufacturers of

Wheelbarrows of every description, for every purpose. If it is a Wheelbarrow you want we have it in Railroad or Navy, Steel Tray or all Steel, Garden or Lawn.

Wheel Scrapers, pressed bowl or square box in two sizes Nos. 2 and 3.

Drag Scrapers, pressed steel handles on top or sides, with or without runners.

Ox Shovels, Fresno or **Buck Scrapers**

Dump Carts, Dump Cars, Grading Ploughs

Trucks, Bag, Warehouse, Platform

Sterling line of Roller Bearing easy pushing Concrete Wheelbarrows and Carts

Write for prices and complete catalogue

THE MILTON PRESSED BRICK CO.

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

We are Agents for the Fiske Tapestry Brick, suitable for high-class residential work. At our Toronto Office we have set up panels of the different color schemes and would be pleased to have you call and examine them.

Head Office: Milton, Ont. Toronto Office: Janes Building

EADIE-DOUGLAS LIMITED, Ottawa Agents

Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

Newel Post
No. B.L. 106

BATTS

Limited

FOR

Columns
Newel Posts
Doors
House Trim
Sash

Door No. B L 312

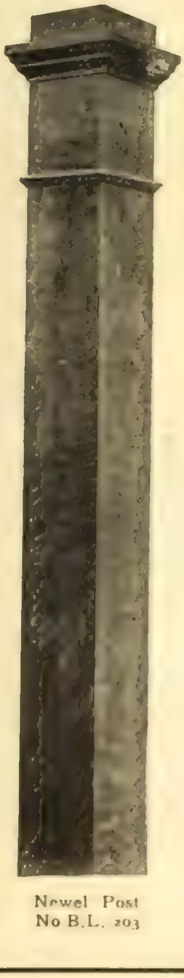
With our immense column department containing over 10,000 square feet of floor space and equipped with up-to-date machinery we are able to handle your orders promptly and properly.

Our doors do not warp, sag or check.

We have a catalogue for you.

Batts Limited

374 Pacific Ave., West Toronto



Newel Post
No B.L. 203

Door No. B L. [illegible]

John Whitehead & Co.

LIMITED

Albert Work: PRESTON, ENGLAND

Makers of

Reliable BRICK MACHINERY Efficient

Tile and Pipe Machinery, and

CLAY WORKING PLANT

for all classes of Clays and Shales.

INQUIRIES SOLICITED. CATALOGUES POST FREE.

Established over 75 years. TELEGRAMS: Brictile, Preston

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

The Mirrlees-Diesel Crude Oil Engine

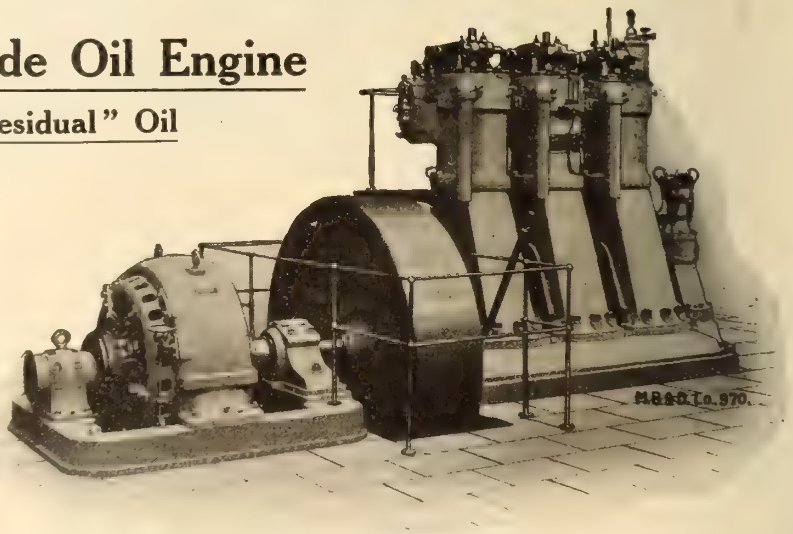
uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear
No Producer
No Chimney

No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breaksdown
Cheaper Buildings and Foundations
Unskilled Labour only
No Standby Losses

HIGH SPEED SLOW SPEED



35 to 1000 B. H. P.

TENTS
for Engineers and Contractors

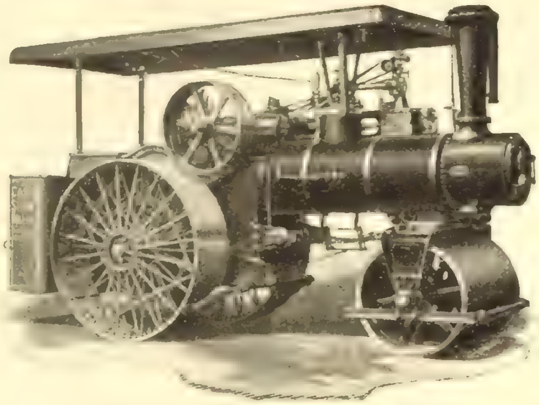
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

Woods Limited
Woods Building - Ottawa, Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT
THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18″ x 26″ cylinder Mogul, Standard Gauge, and 18-10″ x 14″ Vulcan and Davenport dinkeys, 36″ Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36″ Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8″ Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag Scrapers and 4—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36″ Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW
May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. & Dolland Lane - - MONTREAL, CANADA

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones. Office North 604 605 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C. P. R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

RECIPROCITY

means to exchange. We have high quality fittings, you have good money. Lets get together.

S BRAND

Cast Iron Fittings and Valves are Right

"Everlasting" Blow-off Valve
SIMPLE — DURABLE — EFFICIENT

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

FIRE BRICK

GLENBOIG GARTCOSH

It has been said of **"GLENBOIG" FIRE BRICKS** that "every improvement made in the quality of our Fire Bricks, makes possible another advance in the practical science of metallurgy". **"GLENBOIG"** represents **the most perfect Fire Brick** yet produced.

Stocks carried by all principal dealers

MAKER'S SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The Missisquoi Marble Company Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd.	Toronto, Ont.
C. N. Barclay	Winnipeg Man.
Bosse & Banks	Quebec, Que.
General Contractors Supply Company, Ltd.	Halifax, N. S.
129 Sparks Street	Ottawa, Ont.
James Robertson Co. Ltd.	St. John, N. B.
G. R. Duncan	Fort William, Ont.
Walker & Barnes	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd.	Vancouver, B. C.
315 Coristine Building	Montreal, Que.

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Limited

Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Come to Us If You Need

Hardwood Flooring
Interior Trim
Veneer Doors
Pine Doors
Stairs Frames
Sash, etc.

We manufacture the above from select stock.

J. R. Eaton & Sons
Limited
Orillia, Ontario

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A.

Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

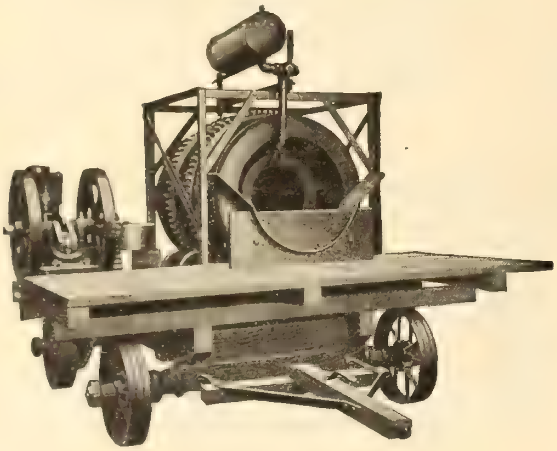
Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

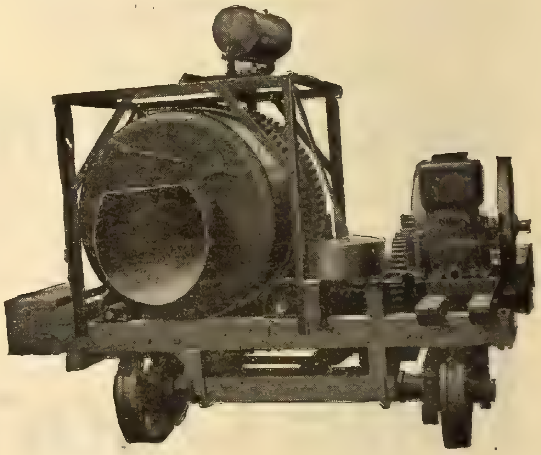
The Low Charging CROPP MIXER

The only Mixer that will not spill when overcharged

Low charge and high discharge covered by Patent 947196.

Either Steam or Gasoline Engine





Our Prices will Interest You

The only mixer having batch constantly in sight of operator.

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

THE
Thames Quarry Co.
St. Mary's, Ont.

CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

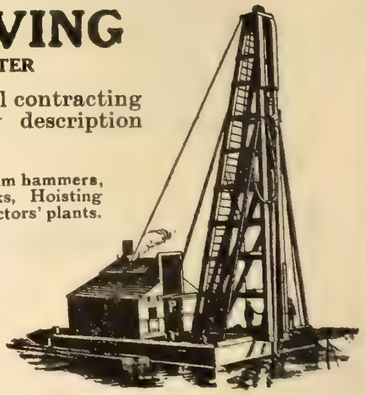
JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.



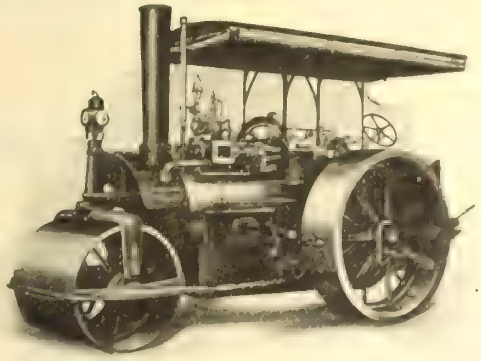
IRON STAIRS

Dennis Wire & Iron Works Co.
Limited
London, Canada

Toronto Offices - 12 QUEEN STREET E.

Cut shows a four wheel steam Locomotive Crane with 40ft. boom handling forms on New York Catskill Aqueduct at Valhalla, N.Y These contractors are finding our cranes indispensable in this work, as they can be used for so many purposes; such as handling loose materials as broken stone, sand, concrete, etc., heavy timbers, rails, concrete forms, etc.

THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City



THE
WATEROUS
DOUBLE CYLINDER
ROAD ROLLER

"Over 100 sold in Canada"

THE WATEROUS ENGINE
WORKS COMPANY, LTD.,
BRANTFORD, CANADA

DOMINION BRIDGE CO.
LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter
River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO
Branches - Vancouver and Winnipeg
Montreal

The
Phœnix Bridge & Iron Works Limited
MONTREAL

General Steel Contractors

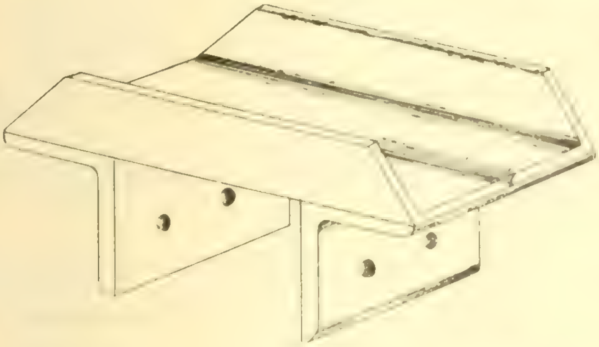
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

Portland Cement

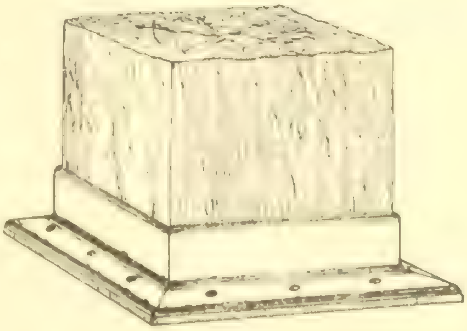
High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

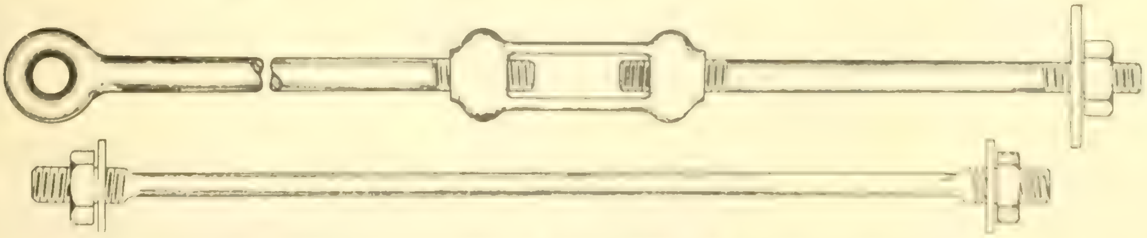
Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company Limited
Hamilton, Canada



STEEL POST CAPS
and BASES
for Wooden Posts,
any size.
Also made in
Cast Iron





EYEBOLTS, TURNBUCKLES and RODS of all descriptions

Beams, Angles, Channels, Plates, any size from 1½ inch to 24 inches, and any length up to 70 feet

S. S. SELMAN, President — A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.

Limited

Home Bank Building, 8 King Street W., Toronto

Works: Port Credit, Ont.

James Thomson, President. J. G. Allan Vice-President. James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.

LIMITED

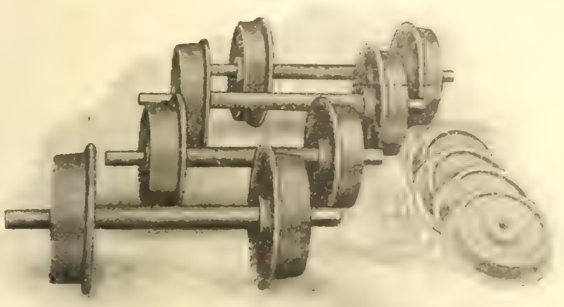
Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que. Three Rivers, Que. St. Thomas, Ont.
Hamilton, Ont. Midland, Ont. Fort William, Ont.
Londonderry, N. S.

PROMPT DELIVERIES

Fellowes and Fellowes
59 Yonge Street., TORONTO
Engineers' and Contractors' Machinery

Steel Dump Cars, Hoisting Engines, Derricks Pumps, new and second hand Rails and Cars, Turntables, Clam Shell and Orange Peel Buckets, etc. Contractors' Elevating and Conveying Machinery.

Phone Main 6805—6806
The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE
The Ready Mixed
Hard Wall Plaster
Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"
Conduits
for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited
LARGEST MANUFACTURERS IN CANADA OF

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments Works and Offices: Ashbridge's Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS

CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office. Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street East, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

FRANK BARBER, York County Engineer.
C. R. YOUNG, B. A. Sc., A. M. Can. Soc. C.E.

BARBER & YOUNG

Bridge and Structural Engineers

Steel and Reinforced Concrete Bridges and Buildings, Foundations, Municipal Work.

'Phones { Day, M. 1664
Night, C. 118 or N. 3217

57 Adelaide St. E
TORONTO

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 413, Pacific Block, Vancouver, B. C.

CONCRETE BARGES

SPECIFICATIONS AND PLANS OF

Reinforced Concrete Barges, Pontoons and Scows

PREPARED BY **James Taylor,**

CONSULTING AND INSPECTING ENGINEER,
MONTREAL

P.O. Box 95, Station B Enquiries Invited

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Allan Keefer

Architect

Ottawa, Ontario

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

H. SYD. HANCOCK Jr.

A. M. Can. Soc. C. E. A. M. Am. Soc. C. E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St.
Montreal

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered .t Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	...	15.00
91 to 95 "	...	17.50
Brass Goods, Valves, etc.		
96 to 100 "	...	20.50
101 to 105 "	...	24.00
106 to 110 "	...	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	...	...	14.00	10.50
90 u. i.	...	...	16.50	11.50
95 u. i.	...	...	18.00	13.50
100 u. i.	...	...	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic. any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—⅛-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 65 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4½ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 37½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 75 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.35; ½-inch, $1.40.

Binder stone, $1.35 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 40 cents per foot.

Rubble stone in car lots, $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered f.o.b. Toronto.

Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.

Lime, per cwt., delivered, 38 cents.

Plaster of Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

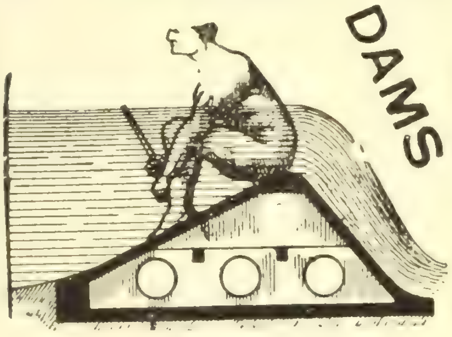
Expanded Metal, No. 10 gauge, 3½ cents per square foot.

Rails for Contractors, Switches, Girders, etc.
New and Second Hand.
Locomotives and Cars
JOHN J. GARTSHORE
58 Front Street W., TORONTO

Arthur L. Weeks
Architect
Canada Life Building, Ottawa
Reinforced concrete and steel structures, factories and commercial buildings

Bonds of Suretyship for Officers and Employees in positions of trust
Bonds Bid and Supply in lieu of Certified Cheques when [illegible] Tendering or Contracting for the Furnishing of Supplies
The
Guarantee Company of North America
[illegible]
Head Office - Montreal
Capital and Resources over [illegible]
Claims Paid over - - - $2,265,000
[illegible]
[illegible]

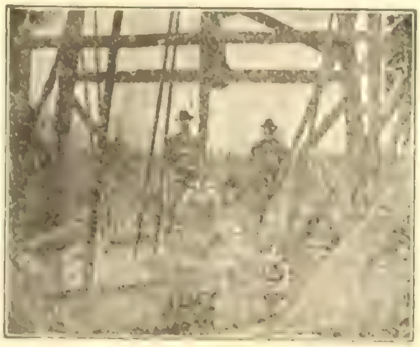
ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS, General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD



Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Victoria Ave., Westmount, Quebec. "The Modern Tarvia Pavement."

Send for New Booklet

We have recently issued a new and beautifully illustrated booklet, detailing the experience of many town authorities and road engineers with Tarvia.

It shows how in one case after another Tarvia was first tried on experimental strips, frequently in competition with other materials. Then after the experience of a year or so, all other dust layers and road binders were discarded and Tarvia was used more and more extensively.

Some engineers have adopted the broad policy of using Tarvia in all *new* macadam construction. Many road authorities go still further and aim to treat all the old macadam roadways with Tarvia to preserve them against the destructive effect of automobile traffic and prevent dust.

We want property owners to know that a dusty road is not merely a nuisance to them but is an endless burden upon them as taxpayers—because dust means that the macadam is pulverizing and the surface blowing away.

We want property owners to realize that the road authorities of their town can give them comparatively dustless macadam roads at little or no extra cost.

We want road engineers to realize that they can reduce their maintenance costs by bonding their roads with Tarvia, and that the saving in maintenance will generally pay for the Tarvia application.

We therefore urge everyone interested to send for our booklet to nearest office.

The Paterson Manufacturing Co. Limited
Montreal Toronto Winnipeg Vancouver
The Carritte-Paterson Manufacturing Co., Limited
St. Johns, N. B. - Halifax, N. S.

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILE, CRESTINGS, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

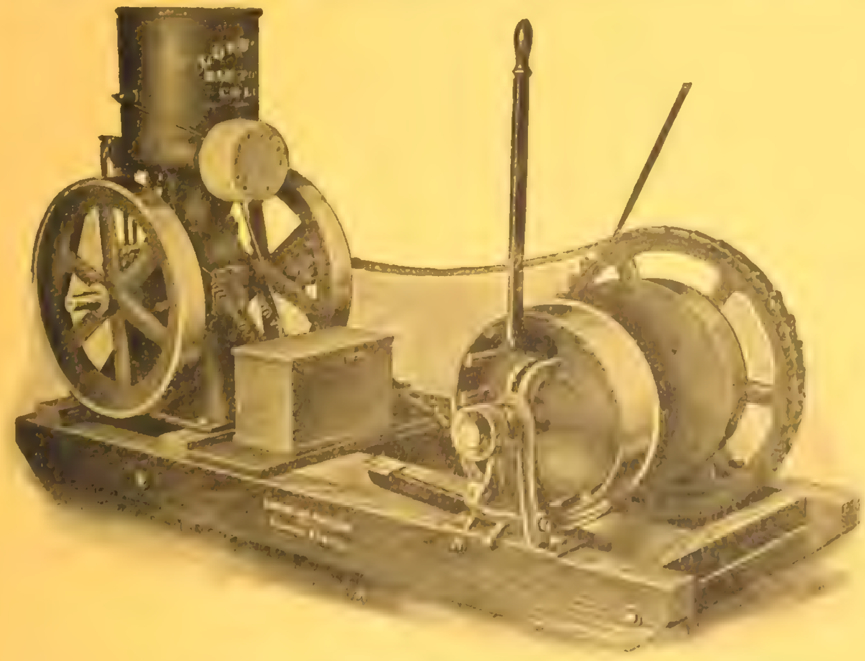
WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor

Montreal Agent: E. F. DARTNELL, 157 St. James St. **Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade**



Complete 5 H. P. Hoisting Outfit, Operating Side

Here is a Hoisting Outfit that Has Saved Money Let it Save Yours

A **"London"** self contained engine mounted on the strong bolted frame with our famous **"London" Friction Clutch Hoist** with ball bearing thrust, will give you an outfit hard to beat.

The gearing consists of sprockets and heavy malleable iron chain.

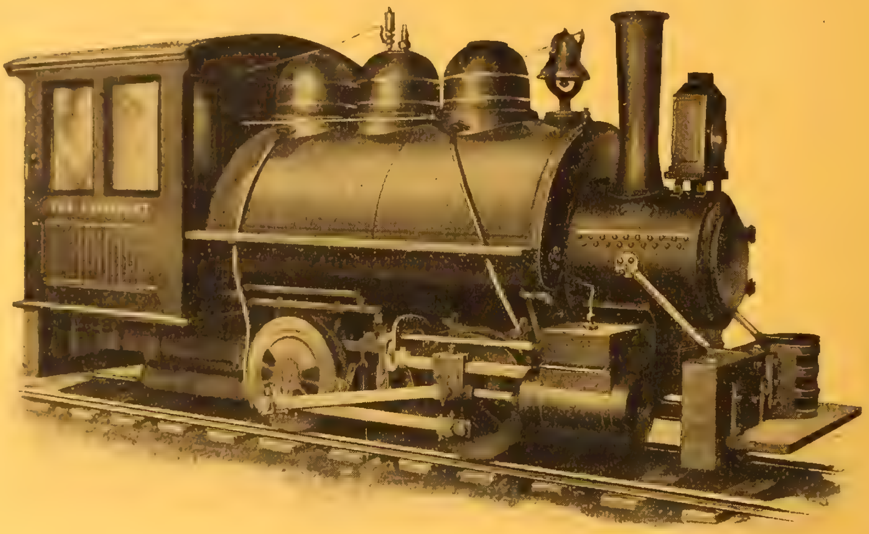
Send for our Literature which contains complete description of the above outfit.

The London Gas Power Company Limited, London, Canada

ENGINEERS and MACHINISTS

"Davenport"

LOCOMOTIVES



For Contractors' and Quarry Service

Supplied in any size and type for various gauges of track.

"Kilbourne & Jacobs"

DUMP CARS

are stronger—longer running—safer cars—cars that will do work cheaper than any other make to be obtained.

Let us tell you why—

Catalogue upon request.

F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.

Vol. 25 Toronto, May 17, 1911 No. 20

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

We manufacture Steam and Power Pumps
Condensers, Travelling
Cranes, etc.

Write for Catalogue

The **Smart-Turner Machine Company**
HAMILTON, ONTARIO Limited

"MADE IN CANADA"

Bent Glass

Made in all
Kinds of
Glass
on Short
Notice

Large Bent Plate Glass for Shop
Fronts a Specialty

**The Toronto Plate Glass Importing
Company, Limited**
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

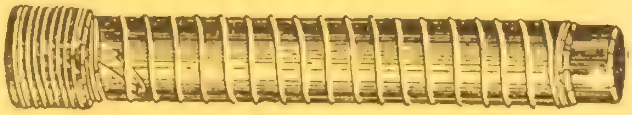
**Belt Driven
Portable**

CONTRACTORS

**Air
Compressors**

Page 28.

Canadian **RAND** Co., Ltd.
Commercial Union Bldg., Montreal, Can.



Continuous and Machine Banded Wood Stave

WATER PIPE

RESERVOIR TANKS

for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Expert Report on Toronto's Defective Building By-Law

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

The Largest and Most Expensive Reservoir in the World

The Ashckan Dam and Dikes near Brown sta. N.Y.

CONTRACTORS: MacArthur Bros. and Co., and Winston and Co., Brown Sta. N. Y.

90 "AMERICAN" Engines
80 "AMERICAN" Derricks
7 "AMERICAN" Locomotive Cranes

Used in the construction of this great project.

¶ Send coupon for information and prices on "AMERICAN" ENGINES, DERRICKS, MATERIAL ELEVATORS, HORSE POWERS, CRABS, ETC. . . . . . .

American Hoist & Derrick Co.

ST. PAUL, MINN.

AUTHORIZED AGENTS:

Gorman, Clancey, & Grindley,	Edmonton and Calgary, Alta. and Nelson, B. C.
Vancouver Machinery Depot, Ltd.	Vancouver, B. C.
J. L. Neilson & Co.,	Winnipeg, Man.
Dunn Brothers,	Winnipeg, Man.
J. A. McTaggert,	Winnipeg, Man.

AMERICAN HOIST & DERRICK CO. ST. PAUL MINN.

Please send prices and information on "AMERICAN

(state what you are interested in)

Name ____________________

Addess ____________________

It is perhaps not generally known

that we have an Information Department consisting of trained and practical men, whose time is employed solely in answering enquiries from people interested in cement.

Now it will be readily understood

that out of the mass of enquiries that come to us, there are a number that include questions as to what might be termed Allied Industries. These we now answer to the best of our ability, but we could answer them still more satisfactorily, if manufacturers of materials used in conjunction with cement would co-operate to the extent of sending copies of their catalogues and other literature to be placed on file in our office for reference.

We should like to obtain

the names and addresses, together with catalogues, and any other obtainable information of manufacturers of and dealers in:

1. **Concrete Machinery**
2. **Building Blocks**
3. **Cement Bricks**
4. **Tile Molds**
5. **Fence Posts**
6. **Re-inforcing Material**
7. **Water-proofing Compounds**

It is not alone for our own convenience that we make this suggestion; firms who manufacture or deal in such articles will find it to their own advantage to have this information in the hands of our Information Department, thereby enabling us to hand on to them from time to time enquiries for such materials as they severally make.

In sending catalogues, literature or information, please address same to "Sales Department."

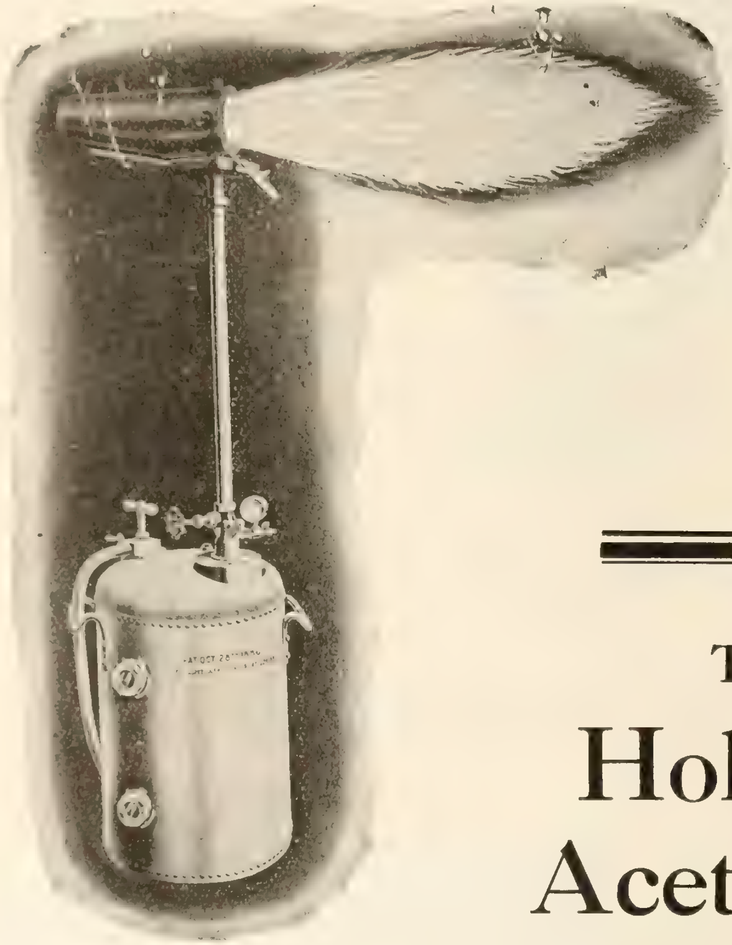
The—

Canada Cement Company

Limited,

Banque National Building - - - MONTREAL

Contractors Lights



The

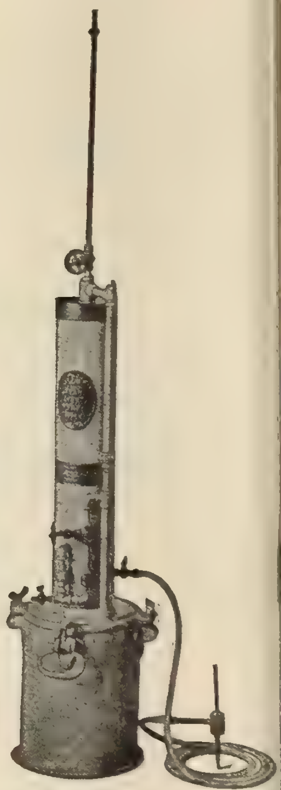
BUCKEYE

1,000 to 4,000
Candle Power

The

Holland
Acetylene
Lamp

100 Candle Power



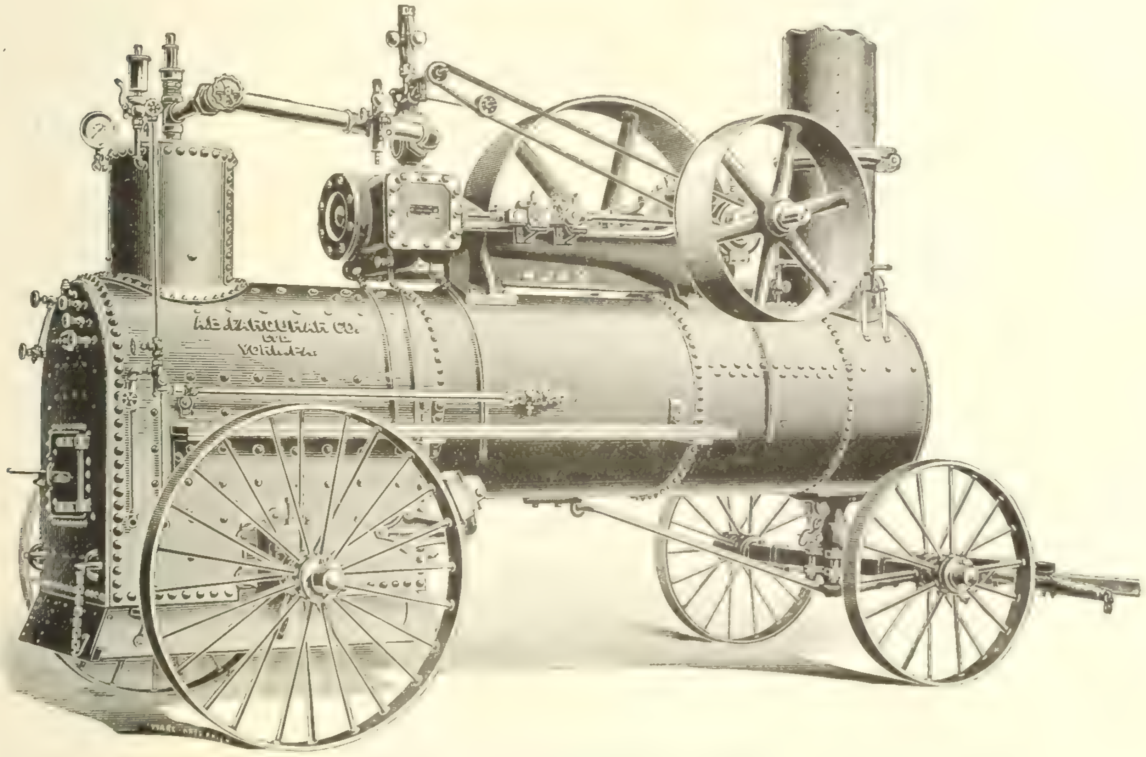
KEROSENE
AND
GASOLINE
TORCHES

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

Portable Outfits

Very High Grade Equipment


A.B. FARQUHAR CO.
LTD.
YORK, PA.

FROM 4 to 50 HORSE POWER

A Bargain

A brand new Vulcan Steam Shovel, with
1¼ yard Dipper. Weight 38 Tons

NEVER USED

FOR QUICK SALE—$6500.00 F. O. B. TORONTO

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects Page
Keele, Alan 92
Weeks, Arthur E 92

Architectural Iron Work
Canada Wire Goods Mfg. Co 70
Dennis Wire & Iron Works 81
Meadows Co., Geo. B. 33

Air Compressors
Escher Wyss & Co 69

Air Valves, Automatic
Marsh, J. P. 88

Asphalt Plant
East Iron Machine Co. 81

Buckets
American Hoist & Derrick Co. 2
Sackett Screen & Shute Co 72

Belting
Federal Engineering & Supplies, Ltd 76

Blowers
Sturtevant Co., B. F. 27

Boilers
Case Threshing Machine Co. 83
Inglis, John 67
Jenckes Machine Co. 2
Leonard & Sons, E 77
Marsh & Henthorn 70
McDougall Caledonian Iron Works 69
Mussens Limited 4
Waterous Engine Works Co. 81

Brick Machinery and Supplies
Berg Mfg. Co. 17
Wert C. S. 23
Whitehead, John

Brick
American Enamelled Brick Co.
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 25
Milton Pressed Brick Co.
Port Credit Pressed Brick Co. 86
Toronto Pressed Brick Co.

Brickmaker's Supplies
Sackett Screen & Shute Co. 72

Bridges (Steel)
Attica Bridge Co. 34
Canadian Bridge Co. 93
Cleveland Bridge Co. 93
Dickson Bridge Works
Dominion Bridge Co. 93
Hunter Bridge and Boiler Works 78
Phoenix Bridge and Iron Works 93
Pennsylvania Steel Co. 92

Cement
Alsen Portland Cement Co. 74
Britnell & Co. 74
Bremner, Alex 91
Canada Cement Co. 3
McNally & Co., W. 89
Morrison & Co., T. A. 92
Rogers, Alfred Limited 9

Concrete Pipe
Dominion Concrete Co. 22
Lock Joint Pipe Co.

Cement Waterproofing
Ceresit Waterproofing Co 33
Hercules Waterproof Cement Co. 29
Mansbendel, F. P. 30

Cranes, Travelling & Locomotive Page
American Hoist & Derrick Co. 2
Armstrong, H. J. 30
Brown Hoisting Machinery Co. 81
Males Co 64
Willis Shaw Machinery Co 64

Conduits
Conduits Co., Limited 91

Crushed Stone and Granite
Sand and Supplies 72

Concrete Mixers and Machinery
Canada Foundry Co. 20
Cropp Concrete Machinery Co. 86
Famous Block Machine Co.
Gould, Shapley & Muir 16
Hopkins & Co., F. H. 96
Jenckes Machine Co. 2
London Concrete Machinery Co. 33
Milwaukee Mixer Co. 16
Mussens Limited 4
Morrison & Co., T. A. 92
Vining Bros.
Wettlaufer Bros. 10

Contractors' Plant
American Hoist & Derrick Co. 2
Acme Eqpt. & Engineering Co. 79
Beatty & Sons, M. 6
Hepburn, John T. 12
H. & E. Lifting Jack Co. 82
Hopkins & Co., F. H. 96
International Marine Signal Co. 8
Willis Shaw Machinery Co. 64
Meaford Wheelbarrow Co.
Marsh & Henthorn 70
Montreal Locomotive Works 32
Mussens Limited 4
Oshkosh Logging Tool Co. 26
Ritchie Contractors Supply Co. 73
Tiffin Wagon Co. 30

Crushers (Stone and Rock)
Berg Machinery Co. 17
Case Threshing Machine Co. 83
Hopkins & Co., F. H. 96
Jenckes Machine Co. 2
Males Co. 64
Mussens Limited 4
Morrison & Co., T. A. 92
Willis Shaw Machinery Co. 64

Corrugated Iron
Galt Art Metal Co.
Metallic Roofing Co. 71
Metal Shingle and Siding Co. 76
Ormsby, A. B., Limited 11
Roofers Supply Co. 87

Contractors
Bennett, Robt. 89
Foundation Co. 93
Holmes, Fred. 72
McIlwraith, Jas. A. 92
Nadel & Adler 92
Wells & Gray 26

Coal Handling Apparatus
American Hoist & Derrick Co. 2
Down Draft Furnace Co. 79

Derricks and Derrick Fittings
American Hoist & Derrick Co. 2

Drills
Beatty & Sons M 6
Canadian Rand Co. 28

Drilling Contractors
Harvey, J 93

Dredges Page
Beatty & Sons, M 6
Males Co. 64
Willis Shaw Machinery Co 64

Dry Kilns
Sturtevant Co., B. F. 27

Electrical Apparatus, Motors
Canada Ford Co.

Engines
Case Threshing Machine Co. 83
Canadian Boving Co.
Inglis, John 67
Jenckes Machine Co. 2
Leonard & Sons, E 77
Mussens Limited 4
Sturtevant Co., B. F. 27
Waterous Engine Works Co. 81

Engineers (Civil) and Mechanical
Barber & Young 92
Chipman & Power 92
Bowman & Connor 92
Farmer, John T. 92
Fuce, Edw. O. 92
Galt Engineering Co., John 92
Glaubitz, H. J. 92
Hancock, H. Syd. 92
Inglis, John 67
Kennedy, Jas. C. 92
Lea & Ferguson 92
Mace, T. Harry 92
Mitchell, C. H. 92
McRae, John B. 92
Moore & Scollan 92
Taylor, James 92

Exhaust Heads
Sturtevant Co, B. F. 27

Filters
American Water Softener Co. 74

Friction Clutches
Berg Machinery Co 17

Field Instruments
Gurley, W. & L. E. 70

Fire Brick
Gibb, Alexander 83

Fire Apparatus
Morrison & Co T. A. 92
Seagrave, W E. 84

Fireproof Doors and Windows
Douglas Bros. 18
Mussens Limited 4
Ormsby, A. B. 11

Gauges, Steam, etc.
Marsh, Jas. P. 84

Granite and Marble
Laurentian Granite Co. 83
Missisquoi Marble Co. 83
Smith Marble & Construction Co. 77

Glass Page
Chance Brothers & Co. 14
Consolidated Plate Glass Co. 72
Luxfer Prism Co.
Thompson & Co., B. & S. H 14
Toronto Plate Glass Importing Co. 1

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E 77

Hoisting Machinery
American Hoist & Derrick Co. 2
Beatty & Sons, M. 6
Canada Ford Co.
Inglis, John 67
Jenckes Machine Co. 2
Hopkins & Co., F. H. 96
London Gas Power Co. 68
Marsh & Henthorn 70
Mussens Limited 4
Sturtevant Co., B F. 27

High Pressure Pipe Lines
Escher Wyss & Co. 69

Hydrants
Canada Iron Corporation 91
Gartshore-Thomson Pipe Co. 90
Kerr Engine Co.

Interior Finish and Doors
Anglin, S. 74
Batts Limited 81
Canada Office & School Furniture Co
DeLaplante, Ltd. 83
Bryan Mfg. Co. 71
Eaton & Sons, J. R. 83
Georgian Bay Shook Mills 73
Rhodes Curry & Co. 72
Sanitary Floor Co. 70
Tillson Co. 27
Wilson Bros.

Lime
Christie, Henderson & Co. 84
Jamieson Lime Co. 31
Standard White Lime Co 79

Metal Lath
Galt Art Metal
Metallic Roofing Co. 71
Noble C. W. 82

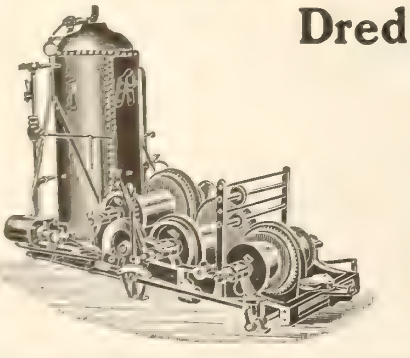
Meters
Hopkins & Co., F. H. 96
McDougall Caledonian Iron Works 69
Neptune Meter Co. 71

Paving and Paving Materials
Dominion Carbolineum Works
Metropolitan Paving Brick Co.
Ontario Asphalt Block Co. 70
Shawmut Paving Brick Co.
Silica Barytic Stone Co. of Ontario 98

(Continued on page 10)

M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges - Ditchers - Derricks
Steam Shovels



Steel Dump and Deck Scows
Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

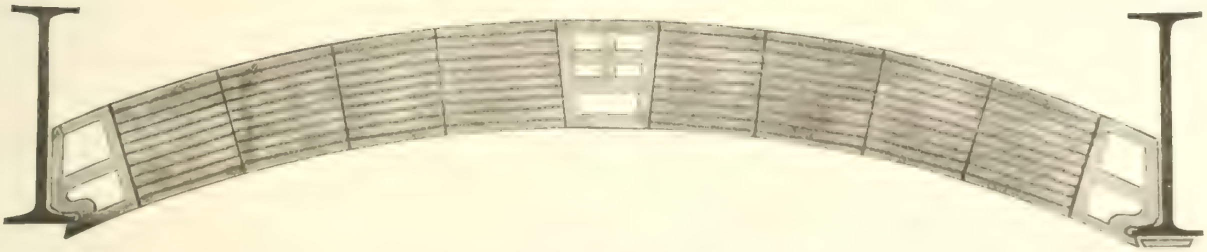
Don Valley Bricks

and Porous Terra Cotta Fireproofing

suited for every purpose of fireproof construction.

Column Covering
Arches

Furring
Blocks



T. C. Fire Proofing of Quality

DON VALLEY

Pressed Brick
Vitrified Brick
Enamelled Brick
Wire-Cut Brick
Porous Terra Cotta Brick

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO
Montreal Agent: David McGill, 206 Merchants Bank Chambers

SIMPLE **PERFECT**

CLEAN WATER

For MANUFACTURERS or MUNICIPALITIES

Can be obtained by using the

"TORRENT" or "PULSOMETER"

FILTER

Complete information furnished on request

International Marine Signal Company Limited

OTTAWA, CANADA

GRAVITY **PRESSURE**

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster	Pag
Albert Mfg. Co.	78
[illegible] & Co.	84
Calkins, H. W.	90

Pipe

American Spiral Pipe Works	79
Canadian Pipe Co.	90
Dominion Wood Pipe Co.	12
[illegible] Concrete Co.	22
Gartshore-Thomson Pipe Co.	90
Lock Joint Pipe Co.	
[illegible] & Co.	11
National Iron Works	91
Pacific Coast Pipe Co.	1
Pedlar People	

Plumbers' Supplies

Standard Ideal Co.	34

Power Engines

Inglis Co., John	67

Paints and Varnishes

International Varnish Co.	78
Paterson Mfg. Co.	94

Pile Driving Machinery

American Hoist & Derrick Co.	2
Lincoln Construction Co.	80

Pumps and Pumping Machinery

American Well Works	
Beatty & Sons, M.	6
Escher Wyss & Co.	69
Goulds Pump Co.	
Hopkins & Co., F. H.	96
Inglis Co., John	67
Leonard & Sons, E.	77
Martin Pump and Machine Co.	81
McDougall Caledonian Iron Works	69
Mussens Limited	4
Ontario Wind Engine & Pump Co.	86
Smart-Turner Machine Co.	1
Waterous Engine Works Co	81

Roofing Contractors

Schwoerer & Sons, A.	

Roofing Materials	Page
Asbestos Mfg. Co.	24
Galt Art Metal Co.	
Metallic Roofing Co.	71
Metal Shingle & Siding Co.	76
Noble, Clarence W	78
Paterson Mfg. Co.	94
Philip Carey Co.	77
Roofers Supply Co.	91
Standard Paint Co.	

Railway Supplies

Gartshore, John J.	87
Hopkins & Co., F. H.	96
Mussens Limited	4

Reinforcements. Concrete and Steel

Ambursen Hydraulic Construct'n Co.	87
Canada Wire Goods Mfg. Co.	70
Concrete Form Engine Co.	71
Steel Co. of Canada	23
Steel & Radiation	19
Trussed Concrete Steel Co.	95
Turner, C. A. P.	

Road Machinery

Case Threshing Machine Co.	83
Hamilton Machinery Co.	15
Morrison & Co., T. A	92
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co.	20
Hopkins & Co., F. H.	96
Mussens Limited	4
Males Co.	64
Willis Shaw Machinery Co.	64

Stone

Britnell & Co.	84
Brodie, Jas.	
Christie, Henderson & Co.	84
Consolidated Stone Co.	
Contractors' Supply Co.	84
Corinthian Stone Co.	80
Crushed Stone, Limited	77
Doolittle & Wilcox	70
Hagersville Contracting Co.	11

Sand and Gravel

Sand & Supplies	72

Stone	Page
Laurentian Granite Co.	92
McMillan & Son, R.	82
Morrison & Co., T. A.	92
Myers, Oakley	77
Roman Stone Co	13
Sackville Freestone Co.	8
Sand & Supplies	72
Thames Quarry Co.	86

Steam Apparatus

Sturtevant Co., B. F.	27

Submarine Diver

Rouleau, Joseph N.	93

Structural Iron and Steel

Buffalo Steel Co.	82
Dominion Bridge Co.	88
Steel Co. of Canada	23
Pennsylvania Steel Co.	88
Phoenix Bridge & Iron Works	89
Reid & Brown	93
Salter, W. H.	89
Steel & Radiation	19

Sewer Pipe

Britnell & Co	84
Canada Iron Corporation	90
Dominion Sewer Pipe Co.	21
GartshoreThomson Pipe Co.	90
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	17
National Iron Works	91
Ontario Sewer Pipe Co.	21
Standard Drain Pipe Co.	21

Stationary and Power Engines

Case Threshing Machine Co.	81

Slate

Roofers Supply Co.	91

Steel Shingles and Ceilings

Galt Art Metal Co.	

Smoke Stacks

Leonard & Son, E.	77

Tents

Woods Limited	83

Safes and Vaults

Taylor, J & J	

Testing and Inspection Bureau

Hunt & Co., Robt. W.	77

Stone Saws	Page
Anderson, Geo	18

Tiles

Smith Marble & Construction Co.,	77

Tanks and Stand Pipes

Berg Machinery Co.	17
Inglis, John	67
Jenckes Machine Co.	2
Leonard & Sons, E.	77
Marsh & Henthorn	70
McDougall Caledonian Iron Works	69
Ontario Wind Engine & Pump Co.	86

Trade Journals

Castellanos A. W.	86

Valves

Canada Iron Corporation	91
Gartshore-Thomson Pipe Co.	84
Kerr Engine Co.	
Marsh & Co, Jas.	84
Standard Fitting & Valve Co.	84

Ventilating and Heating Apparatus

Gardiner & Gaskill	30
Sturtevant Co., B. F.	27

Water Softeners and Filters

Berg Machinery Co.	17
American Wafer Softener	74

Wire Rope

Greening Wire Co., B.	
Smith, Thos. & Wm.	75
Steel Co. of Canada	23

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	70
Crescent Wire Iron Works	93
Sackett Screen & Shute Co	72

Water Wheels

McDougall Caledonian Iron Works	69
Canadian Boving Co.	

Water Turbines

Escher Wyss & Co.	69

Wheelbarrows

Sackett Screen & Shute Co.	72

DON'T BUY a Mixer before you see this one

If you adhere to this advice you will buy one of our Mixers. The illustration shows our Half-yard Heart-shape Mixer with automatic dumping device, and lift hopper filling the Mixer drum

Send for a copy of our illustrated Catalogue of Concrete Mixers and Machinery

Wettlaufer Bros.

178 Spadina Ave., Toronto

A. R. Williams Machinery Company, 15 Dock St., St. John, N. B.
W. E. Ransome, Moosejaw, Sask.

MODERN.

→ ESTABLISHED 1861. ←

MUNDERLOH & Co. Ld.

Sole Agents in CANADA for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS

AN IMPROVEMENT ON CAST IRON MAINS.

51 VICTORIA SQUARE,

MONTREAL.

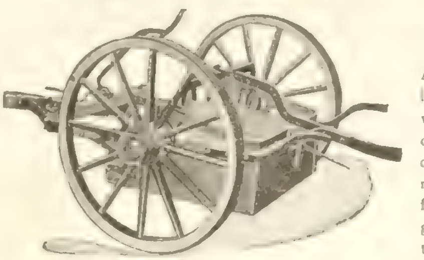
MADE UP TO 40 FEET IN LENGTH.

STRONGER.

CHEAPER.

RELIABLE

Scrapers and Grading Plows



Backed by a Reputation

Ask any contractor of large experience. He will tell you that for over a quarter of a century there has been maintained a reputation for largest capacity and greatest durability for the

"Western" Line of Wheeled and Drag Scrapers and Grading Plows

The reason is a life-time's experience in actual contract work **combined with** an extensive manufacturing experience and every machine has been perfected after years of the most rigid tests.

Western Wheeled Scrapers, the pioneers and most extensively used characterized by square-shaped pans bent cold, general sturdy construction and many patented exclusive features. Built in any size.

Western Drag Scrapers, Chicago Tongue and Western Buck Scrapers.

Western Railroad and **Township Plows**, designed for hardest service and proved by many years of use. Any size from 2 to 16 horse power.

Get our complete catalogue of earth and stone handling machinery.

Western Wheeled Scraper Co.

AURORA, ILL.

Specify the Ormsby

Rolling Steel Doors

for Elevator Shafts

or any opening where space is limited

They are Automatic Heat Closing, can be left in any position and will close of themselves when struck by fire, are very easily operated, require but a foot above opening and 1½" on either side. They are made of cold rolled sheet steel with a deep corrugation, along the sides of the door is a heavy metal shield to protect them from wearing out. This gives them unusual strength and rigidity. Under fire they will not bulge, warp or get out of position, and no openings will form through or around the door.

Let us send you Catalogue and Samples

A. B. Ormsby, Limited

Factories { Corner Queen & George Streets - TORONTO
677-81 Notre Dame Avenue W., WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :

Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

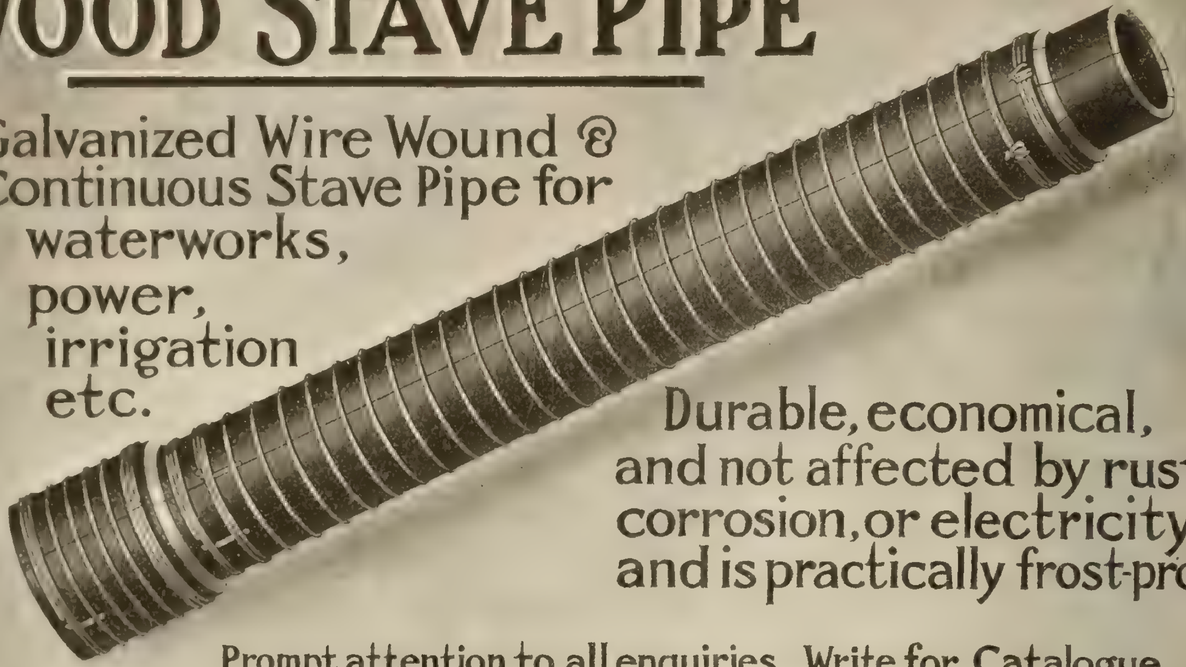
Hagersville Contracting Co.

Limited

Hagersville - Ont.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Have you any use for a Derrick?

There are large plans under way. Large contracts are being placed. In all directions there is bustle and activity. Everything points to an unusually busy season for construction work of all kinds. But what about equipment?

John T. Hepburn

Scotch Derricks

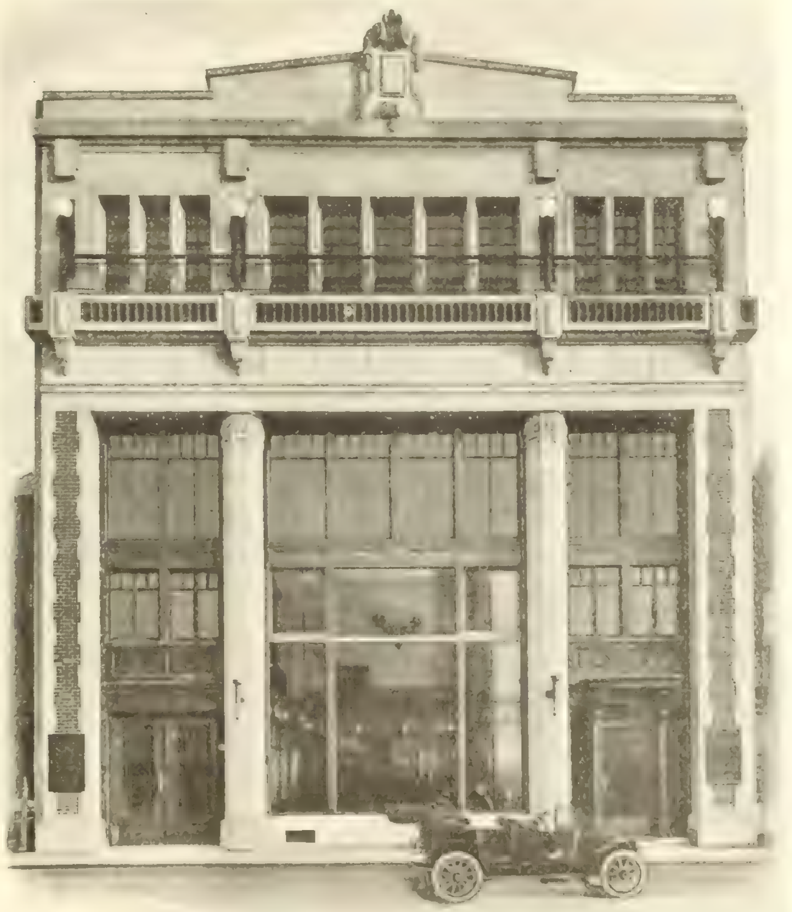
are in use by all leading contractors in all parts of the country. They are designed and built for hard work, combining safety and high efficiency, with low operating cost. Being made in standard sizes, any part can be replaced at short notice. They may be operated by hand or power—are fitted with single and double purchase gears—powerful band brake—and safety locking device that prevents boom from falling.

We are busy now. We shall be busier in two or three weeks
Better place your order to-day to secure early delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

Roman Stone

(Trade Mark Registered)



Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company
Limited

Head Office: 504-5 Temple Building, TORONTO

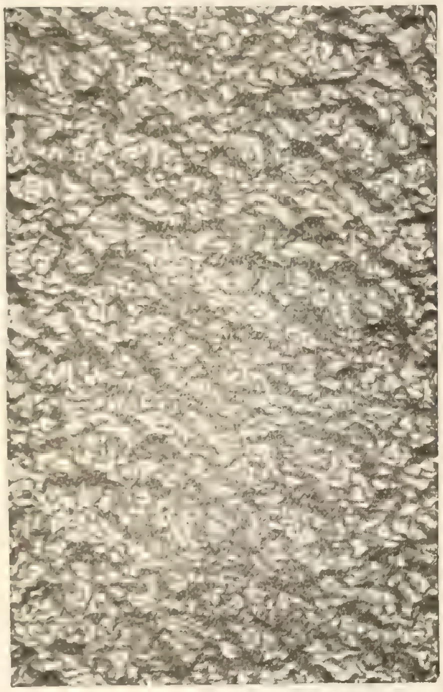
E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

Chance's Figured Rolled Glass

has a smooth and bright surface for cutting, and a deep, sharply defined pattern which gives it a peculiar brilliancy. It cuts easier and looks better than other makes.



Chances Figured Rolled Pattern G
Registered No. 297,595

Chance's Figured Rolled Glass is made in white, blue, green, wine and amber, and in a great variety of patterns. "Pattern G," illustrated here, is a favorite with many architects.

To Architects, Builders and Contractors we will be glad to send, on request, samples, in a variety of tints, of Figured Rolled, Double Rolled Cathedral, Muffled and the new Flemish Glass, manufactured by Chance Bros. & Co., Limited, at their famous glass works near Birmingham, England.

Among the samples you will find glass suited for your very best work, and moderate in price. Write for them now.

Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

"CHAMPION"

Steel Road Graders

NO GRADER that has appeared on the market for years has commanded such success as the "Champion." Its light draft, easy operation, extreme simplicity and thorough efficiency have brought it to the front everywhere. The "Champion" has construction exclusively its own—its superiority needs no argument to those who examine it.

Two Other "Champion" Successes:

"CHAMPION" SPRINKLERS "CHAMPION" ROAD PLOWS

EACH IN ITS FIELD has become an unquestioned leader. Do not place your order until you have seen them. Our catalog gives complete discription of their advantages and a copy will be sent for the asking. Write us to-day for literature and prices.

"Standard in Canada for 20 Years"

The American Road Machine Company of Canada, Limited, Goderich, Ont.

ADDRESS CORRESPONDENCE TO

The Hamilton Machinery Company, Ltd.

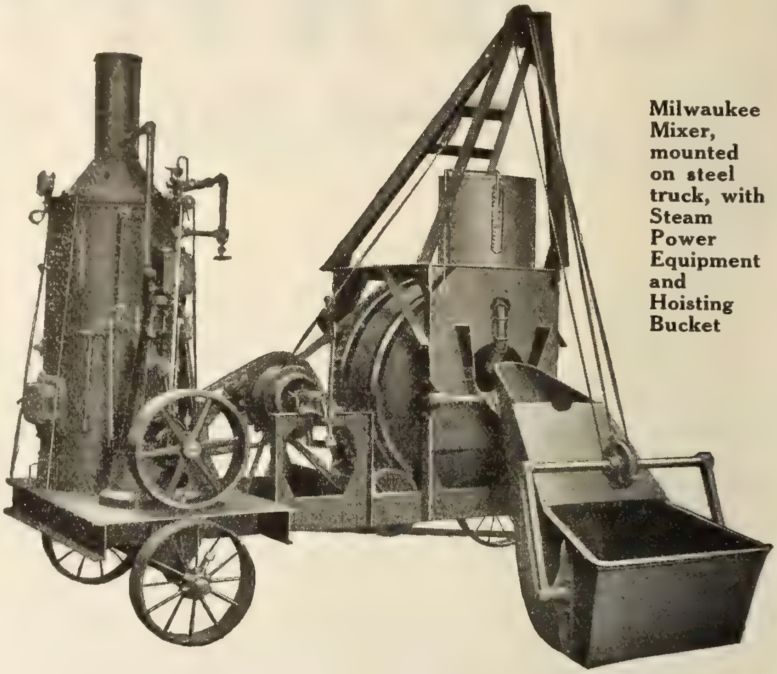
Sole Agents for the above Company.

Hamilton, Ont.

Also Agents for the famous Inter State Automobile

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

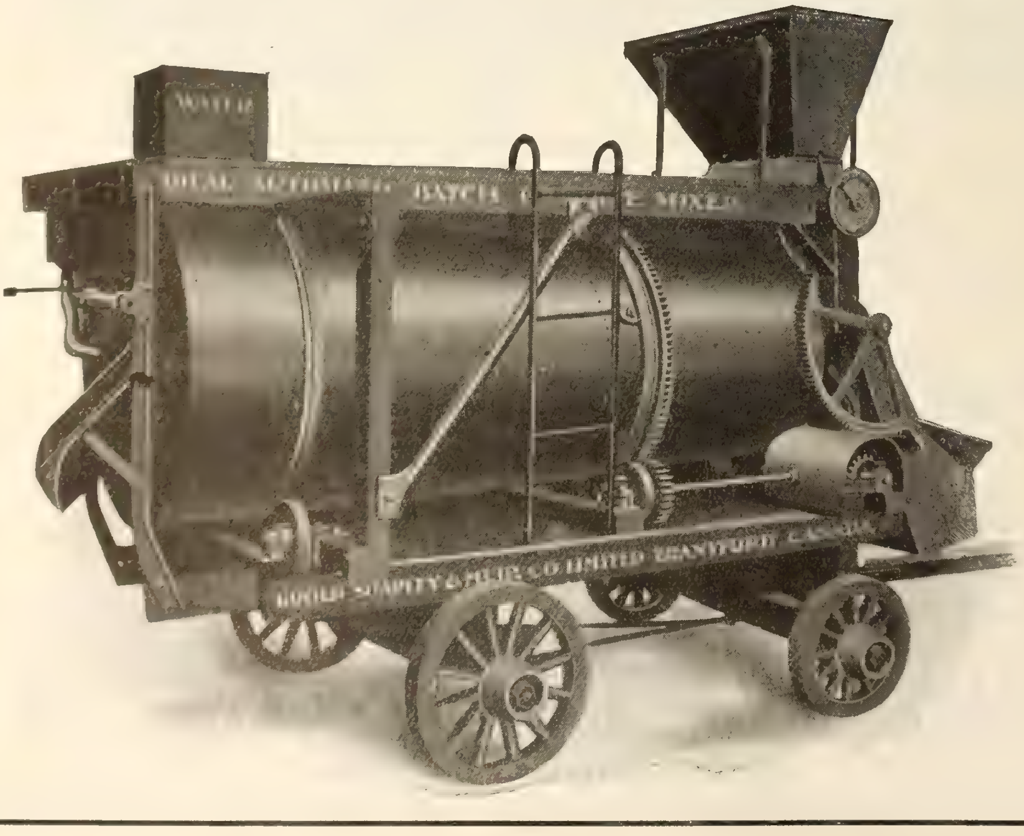
No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES:
The Stewart Machinery Co., Winnipeg, Man.
C. W. Stancliffe & Co., Vancouver, B. C.
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS



Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

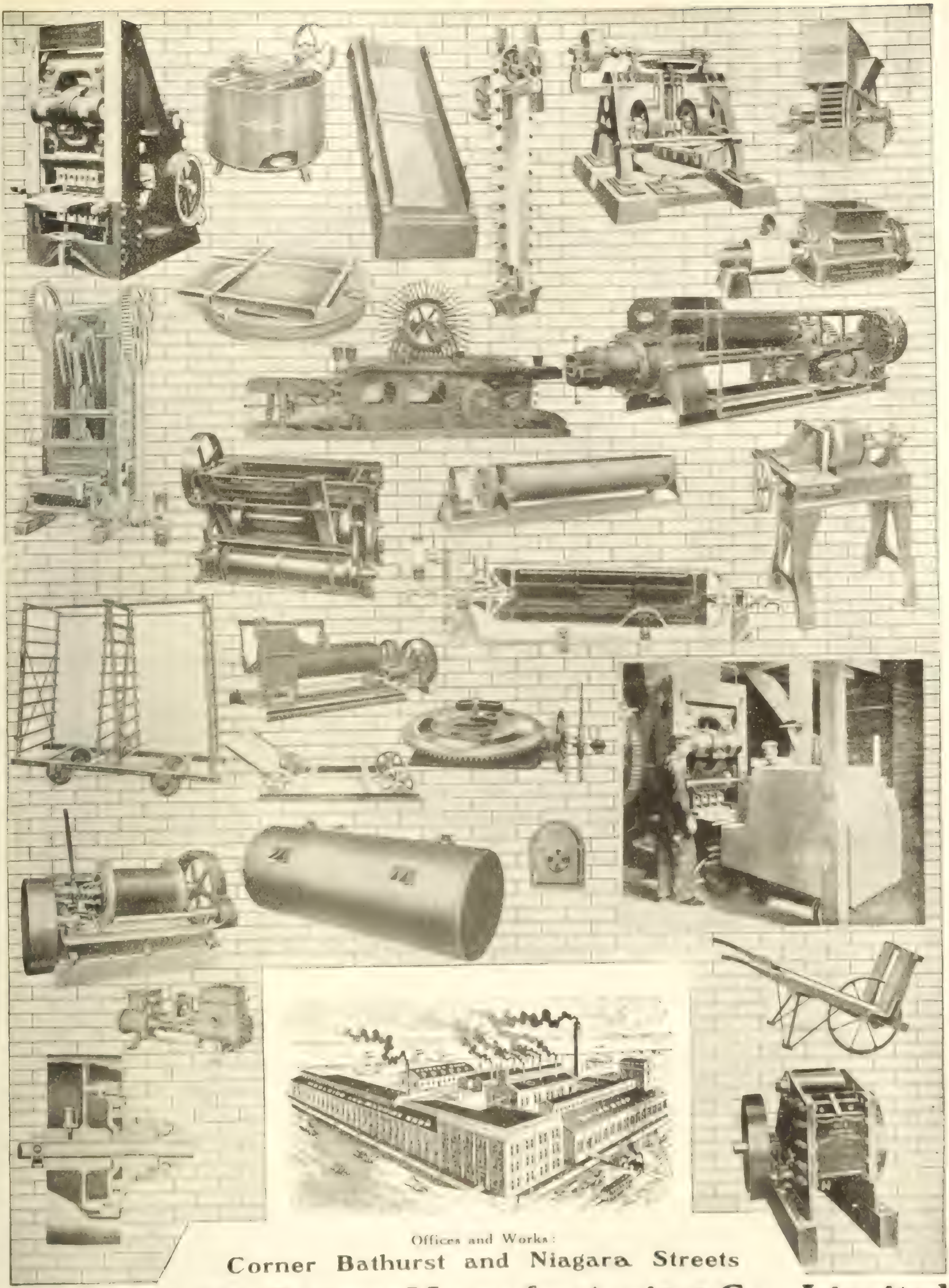
We make

Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada



Offices and Works:

Corner Bathurst and Niagara Streets

The Berg Machinery Manufacturing Co., Limited

Toronto - Ontario

Circular Diamond Saws

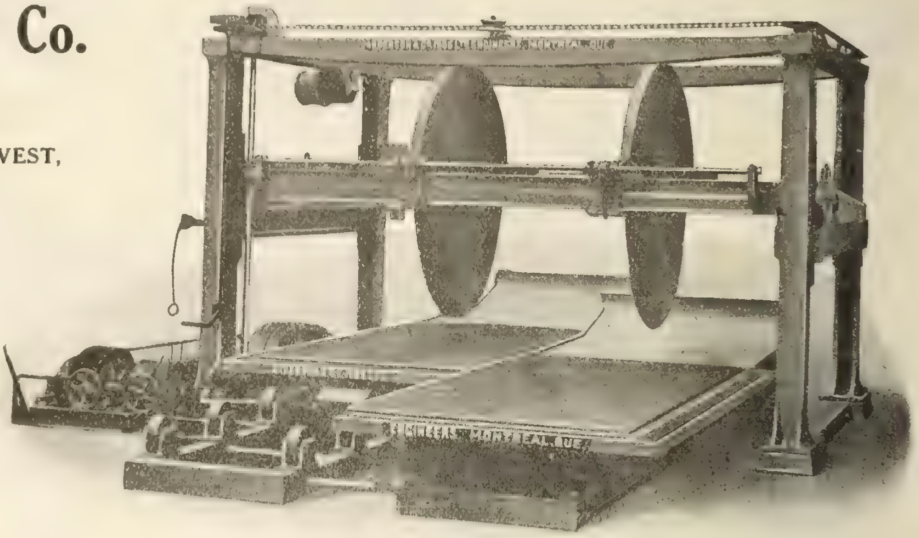
For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICES & WORKS
London, England, 82 Victoria St., S.W.
Newark, N.J., U.S.A. 420-422 Ogden St.
Montreal Works, 157 Craig St. West
Head Works, Carnoustie, Scotland

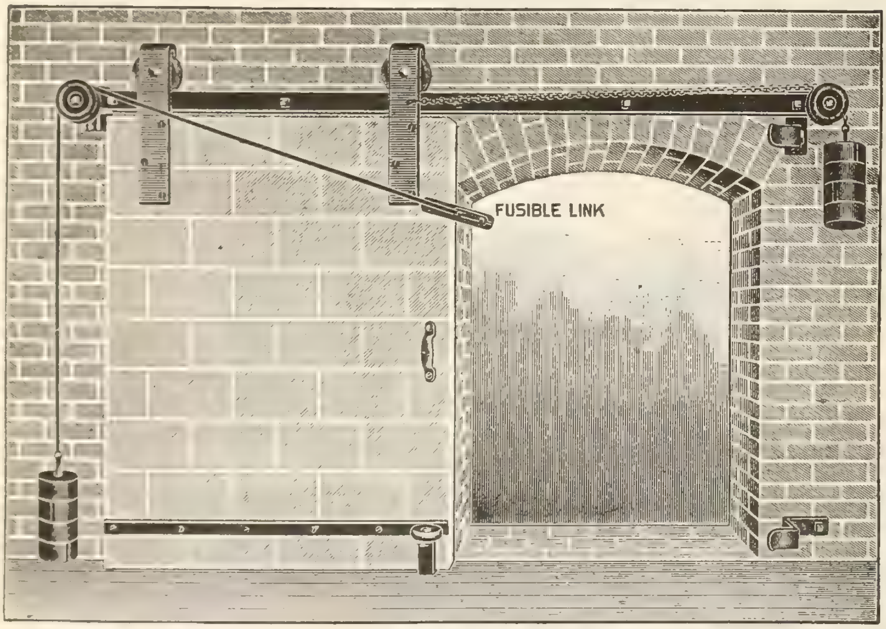
MAKERS OF

Gangs, Planers, Marble Dressers, Derricks, and Electric Traveling Cranes up to 50 tons, Quarry Machinery, Gas Engines and Producer Plants.
10 H. P. to 150 H. P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 SINGLE AND DOUBLE TABLES

About 50 of the above Machines at work in Canada



Fireproof Doors and Windows

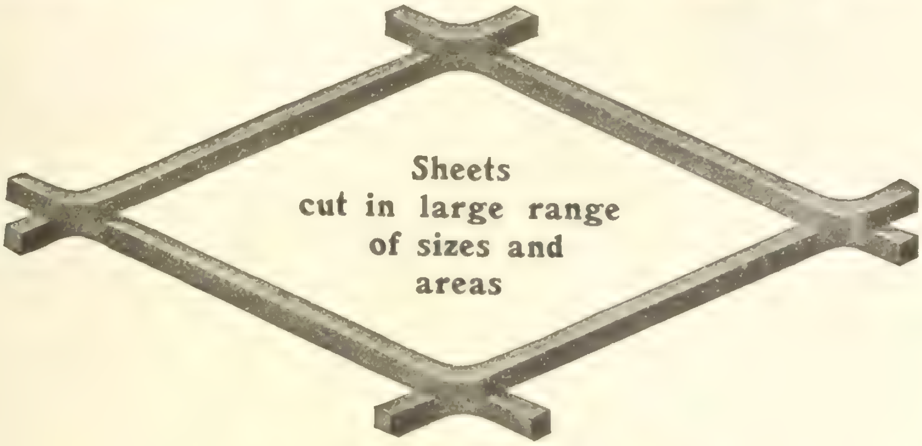
We are specialists in this particular line and can solve your most difficult problems.

Estimates furnished on complete work or any part.

Have you our Literature?

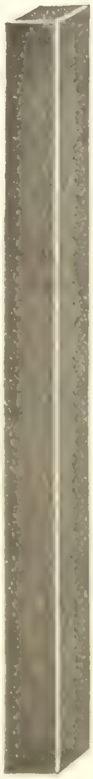
DB DOUGLAS BROS LIMITED DB
TORONTO, ONT. MONTREAL, P.Q.

STEEL AND RADIATION LIMITED



Sheets
cut in large range
of sizes and
areas

Plain Round



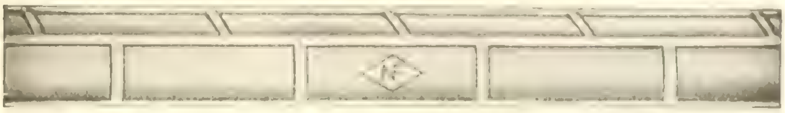
Plain Square

"Steelcrete"

IS the ideal reinforcement for all classes of Goncrete construction, can be successfully laid by unskilled labor and thus reduce your labor costs. Manufactured from open-hearth steel plates by automatic machines which slit and open the meshes simultaneously from the cold sheet, thus increasing the elastic limit and ultimate strength. No "straightening out" ensues when load is applied to split the concrete before reinforcement comes into tension.

Bar Reinforcements

¶ We make a specialty of concrete beam reinforcement and can supply rods and Bars up to 66 feet in length fabricated ready for placing in beams, thus saving your time and money.



[illegible] Bar

STEEL AND RADIATION LIMITED

SHOW ROOMS | MONTREAL, 138 Craig St. W.
TORONTO, 92 King St. W. and
80 Adelaide St. E.

Head Office
TORONTO, ONTARIO

Stocks and
Agencies in All
Leading Cities

J. H. NEW, President RYLAND H. NEW, Vice-President

"WANTED" a Car of Sewer Pipe in a Hurry

Established 1860

How many times during the busy season we are called by long distance phone and asked **"Can you ship us a car of Pipe at once"** our drain is all open and we must have the pipe immediately. Now this is just where

HAMILTON

service is of value, and it is for the very reason that we back up our promises by performance that we have been enabled to build up the largest Sewer Pipe business in Canada. We take care of those rush orders. We are a real live concern.

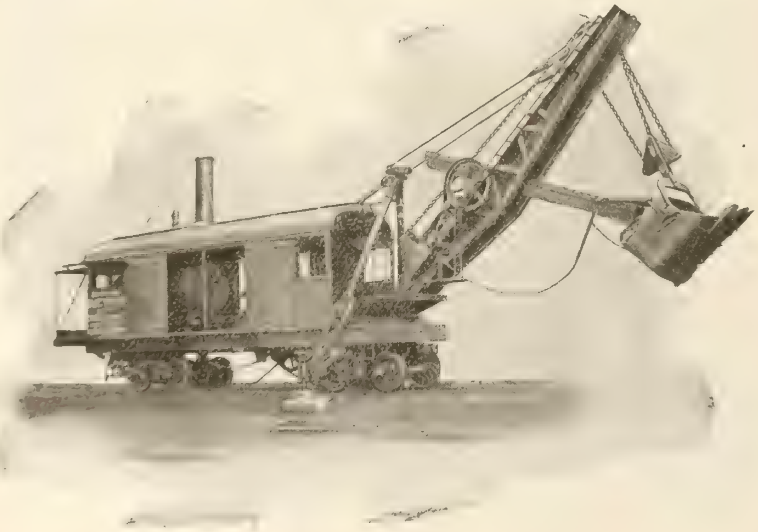
"Let us have our first chance now"

The Hamilton & Toronto Sewer Pipe Co. Limited

HAMILTON and TORONTO

Long Distance Phones:—Toronto, Main 990, College 1558. Hamilton, 3990, 3991, 3432.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert **Pipes**

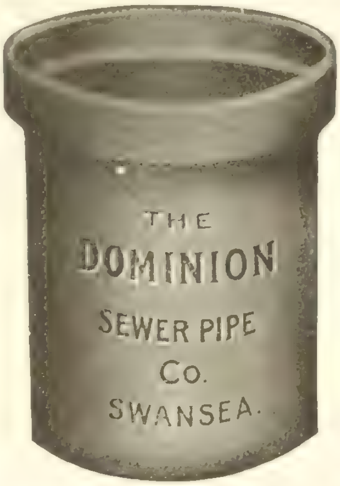
We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.
Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

We are not the Largest Manufacturers
OF
SEWER PIPE
IN THE WORLD
and we have not been at it for Fifty Years either.

The Row of Fame is a Row of VITRIFIED PIPE

18 inch Double Strength

We Have Many Rows Like This In
MIMICO

Sizes 4 in. to 24 in. in any desired quantity

Look at our Pipe

and then tell us if it is necessary for us to make those boasts before we modestly admit that we hold first mortgage on the title of BEST.

ARE YOU FROM MISSOURI?

Then we can produce to your satisfaction if you give us the opportunity.

MIMICO PIPE

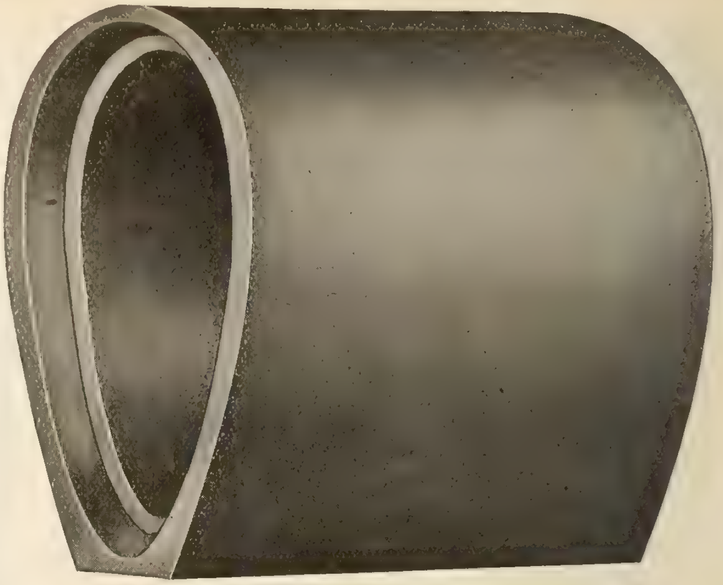
may be equalled, we admit, but it's more than a day's journey to find a better.

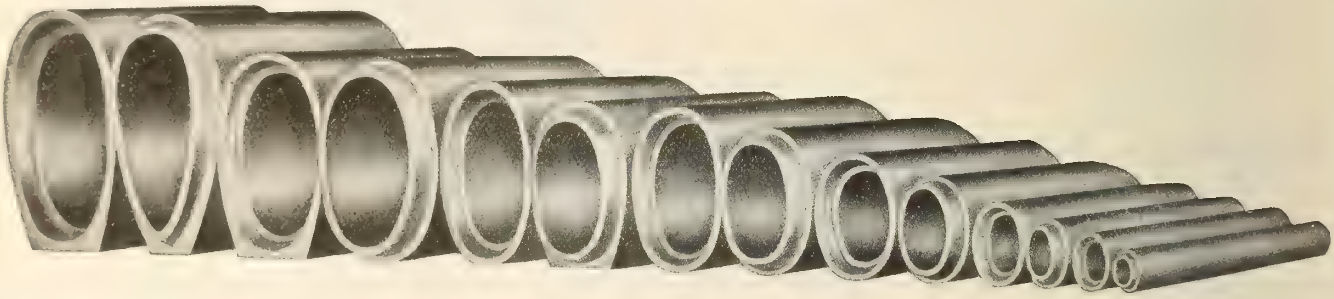
The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422, Evenings Park 3888 and 3889

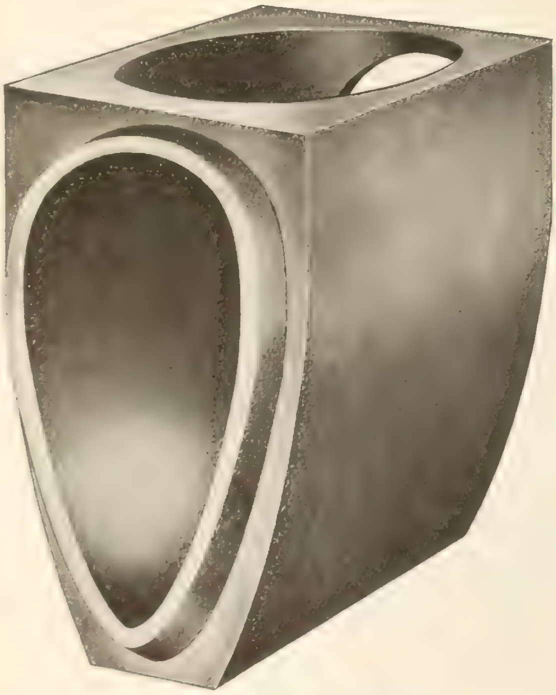
Municipal Engineers and Contractors

For **sewers** the only everlasting pipe is **concrete.** Builders do not use brick in foundations. Why? Because of the moisture. They do use concrete. Why? Because it is a proof against the destructive tendency of moisture. Why continue to use brick for sewers when a better material is now available at as low a cost?

In **Duluth** brick sewers failed after seven years so as to require replacement. **Concrete** sewers put in at the same time are **intact.** In **Millwaukee** after 25 years concrete pipe was found better than when new. Of 300 miles of sewers in **Millwaukee** over 200 miles are of **concrete.**


Section of 2' x 3' pipe




Man-hole Section of 2' x 3' pipe

Concrete sewers abound in **England** and **Germany**. The modern **sewers** of **Paris** are all of **concrete**. American cities have adopted it. **Brooklyn** has hundreds of miles of it with not a single failure, whereas even Scotch vitrified pipe has been found to have deplorably failed there. **Toronto,** after much hesitation, is now in line with concrete. Why be the last to join the ranks you eventually will and must join?

Our circular and egg-shapped sewer pipe are unsurpassed in quality, are more easily laid than flanged pipe, and give no trouble or ridiculous expense over man-holes or connections.

We have replaced vitrified pipe with concrete pipe and have found over 50 per cent of the vitrified unfit for re-laying. We carry a large and mature stock, we guarantee the quality, we take care of breakage in transit, and we solicit your patronage.

WRITE FOR CATALOGUE PRICE

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO

The Steel Company of Canada Limited
Hamilton - Toronto - Montreal

PLAIN ROUNDS,
& SQUARES,
COLD TWISTED
SQUARES

MAXWELL
DEFORMED BAR

STEEL BARS
for Reinforcing
Concrete

THE POPULAR AND SUPERIOR
PERFECT
BRICK MACHINE
AND MY VARIOUS MOULDS ARE USED
IN ALL PARTS OF THE WORLD
Patened in Canada

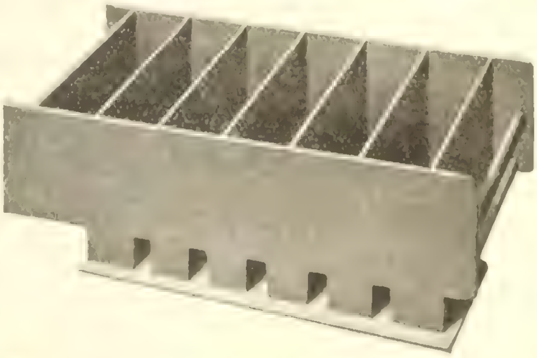
C. S. WERT
Inventor and Manufacturer of
The Perfect Brick
Machine and Moulds

602 North Main St.,
Kendallville, Ind., U. S. A.

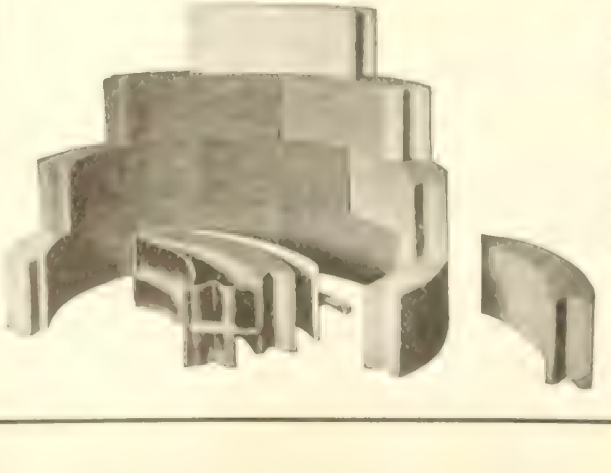
Write for Catalogue and Prices

Agents and Distributers wanted
in Canada

THE POPULAR AND SUPERIOR
PERFECT BRICK MOLD
IS USED IN ALL PARTS OF THE WORLD



The Perfect Well, Cistern and Silo Molds



PRICE LIST
No. 3 Circle Mold. The diameter of [illegible] feet
No. [illegible] Circle Mold. The diameter of [illegible] feet
No. [illegible] Circle Mold. The diameter of [illegible] feet
All Sizes up to [illegible] All other sizes [illegible]

The Circle Molds vary in height from [illegible] depending on the diameter of [illegible]

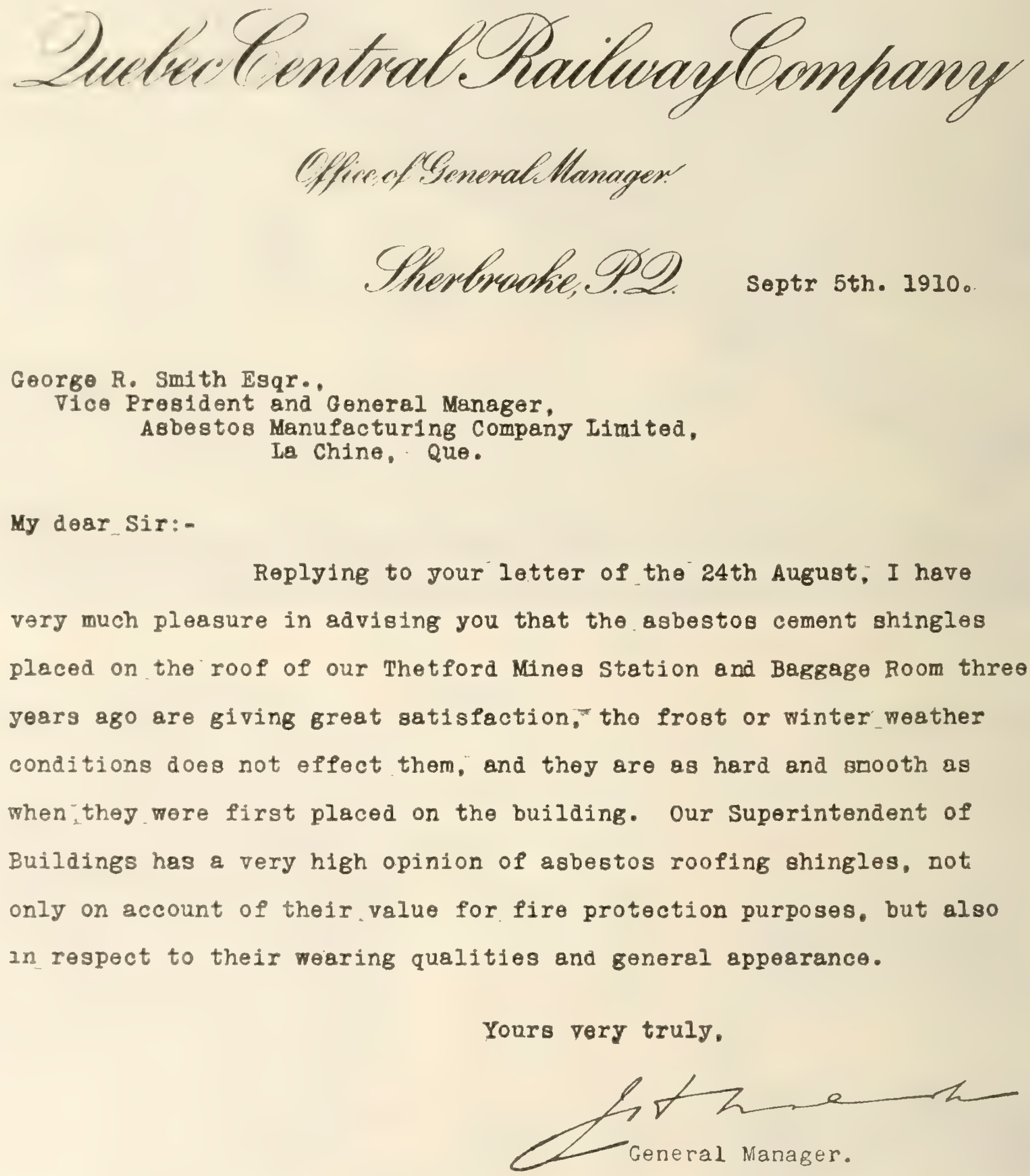
In ordering Circle Molds [illegible] what [illegible] going to build and I will then understand the kind of Circle Mold [illegible]
No. [illegible]
No. 1[illegible] " " " 1[illegible] " "
No. 14 " " " 14 " "
No. [illegible]

Price $15.00 each

Asbestos Cement Shingles

WHAT USERS THINK OF THEM

LETTER No. 2



Quebec Central Railway Company

Office of General Manager

Sherbrooke, P.Q. Septr 5th. 1910.

George R. Smith Esqr.,
Vice President and General Manager,
Asbestos Manufacturing Company Limited,
La Chine, Que.

My dear Sir:-

Replying to your letter of the 24th August, I have very much pleasure in advising you that the asbestos cement shingles placed on the roof of our Thetford Mines Station and Baggage Room three years ago are giving great satisfaction, the frost or winter weather conditions does not effect them, and they are as hard and smooth as when they were first placed on the building. Our Superintendent of Buildings has a very high opinion of asbestos roofing shingles, not only on account of their value for fire protection purposes, but also in respect to their wearing qualities and general appearance.

Yours very truly,

General Manager.

FIREPROOF, WATERPROOF AND EVERLASTING

Write or Wire for Quotations

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P.Q.
Factory at Lachine, P.Q.

We manufacture Air Cell Pipe Covering, Asbestos Paper, Mill-board etc.—in fact we make everything in the Asbestos Line

Hamilton Pressed Brick

Start Right

by specifying Hamilton Pressed Brick for every job where a clean, smooth and distinctive effect is desired.

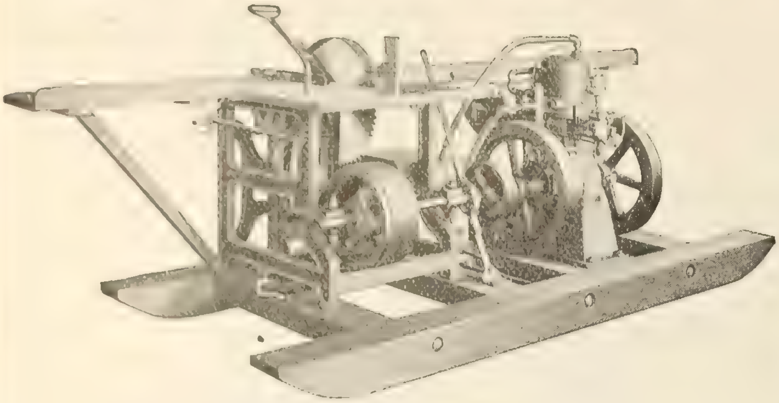
Hamilton Pressed Brick is made from shale, not clay, rich in Iron Oxide free from so called Soda. Besides furnishing this high class product we can fill your orders promptly. Connections with T. H. & B., C. P. R., G. T. R., M. C. R.

Hamilton Pressed Brick Company
Limited

Phones
Factory 1992
Office 2931
Residence 345

Spectator Building, Hamilton, Ont.

DON'T THROW AWAY **Money** IN TIME AND LABOR



Increase your profits and business by using the latest up-to-date machinery and methods.

Oshkosh Portable Saw Rigs

Will enable you to bid lower and Beat out your competitors.

Tear Off the Coupon and Mail To-day
Before your competitor gets ahead of you

Manufactured by
Oshkosh Logging Tool Company
OSHKOSH WIS.

OSHKOSH LOGGING TOOL COMPANY
Oshkosh, Wis.

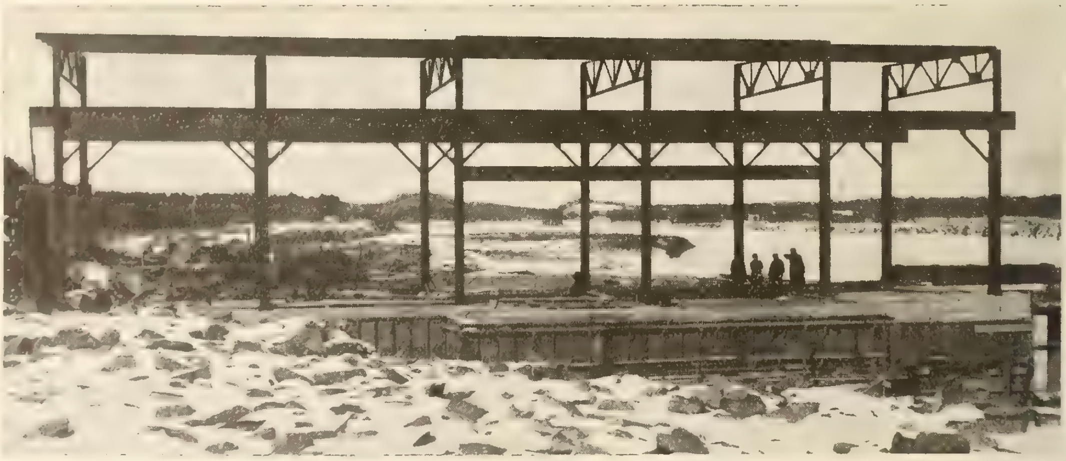
Gentlemen

Kindly send me complete catalogue and prices of the Oshkosh Portable Saw Rig

Name ....

Town ....

State ....



Power House, Sydney, Electric Power Co., Trenton, Ont.

Engineers prefer to have us handle their work since we look after all details of design in a way impossible to the ordinary builder.

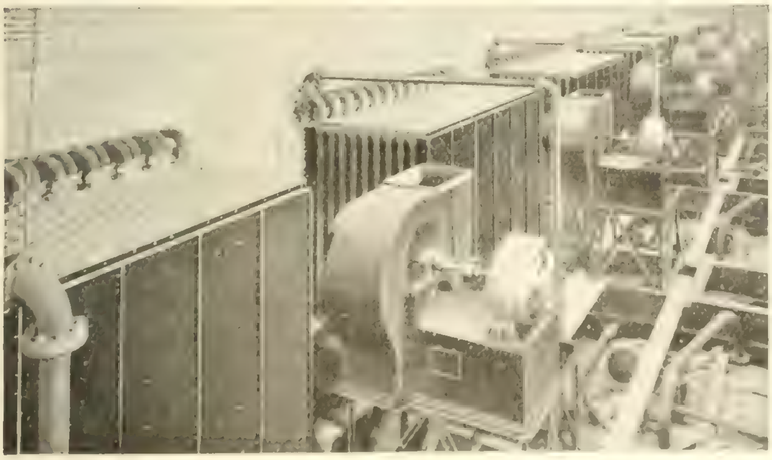
WELLS & GRAY, Limited - Toronto, Ont.

The
Tillson Company
Limited
WHOLESALE MANUFACTURERS OF

Sash, Doors, Mouldings, Frames for Doors and Windows, Columns, Interior Finish of Every Description, Porch Work, Gable Ornaments, Brackets, Head-Blocks, Corner Blocks, Base Blocks, Door and Window Screens, Etc.

Millwork of all kinds

Tillsonburg,
Ontario



At the Power Plant of The Denver Tramway Co.

are installed

6 **Sturtevant** Metal-to-Metal Joint Economizers. *No Gaskets.* Capacity 300 Lbs. Pressure.

6 **Sturtevant** Multivane Induced Draft Fans direct connected to

6 **Sturtevant** Commutating Motors.

All working in connection with 6 Sterling Boilers 4200 B. H. P.

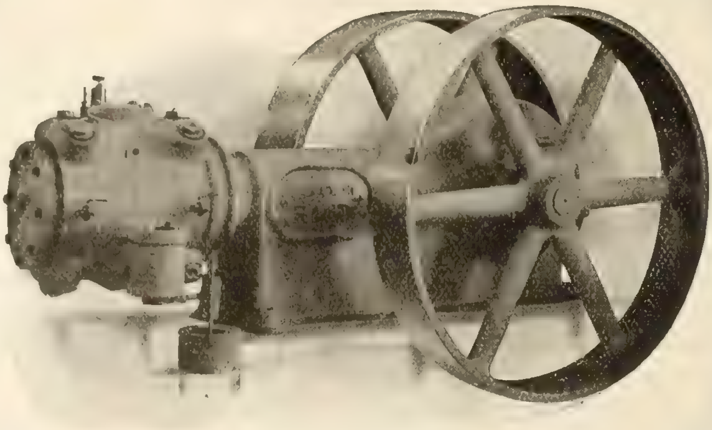
"Economical Fire Room Methods," by F. R. Low, Editor of Power; Sturtevant Bulletin No. 187-N describes the operation and equipment of one of the most efficient and economical power plants in the world, The Wood Worsted Mills, Lawrence, Mass.; told in a most interesting manner by one of the foremost technical writers in this country. It is yours for the asking.

B. F. Sturtevant Co. HYDE PARK, MASS.

Eadie-Douglas, Limited, Montreal Polson Iron Works, Limited, Toronto

SELF CONTAINED

COMPRESSORS



Class "NE—1" Straight Line Belt Driven Air Compressor with Enclosed Dust Proof Frames; High Speed Direct Lift Inlet and Discharge Valves; Automatic, Simple and Reliable Lubricating System.

In the construction of the class NE—1 Straight Line Belt Driven Compressor we have given special attention to the selection of high grade materials, that strength may be had without undue size and weight.

The best of workmanship has been employed, that accurate adjustments made at the outset may be maintained over a long period of operation.

Each part has been designed with care and skill, with a full understanding of the requirements of a successful small compressor, and so well designed that we have no hesitation in offering to the trade the class NE—1 as the best machine, of the portable belt driven type, on the market.

As the small compressor, usually a part of the contractor's equipment, is subject to the minimum of attention and not infrequently to abuse and rough usage, it is essential that such a machine be as nearly automatic as possible yet it must be highly efficient. In the design of the class NE—1 we have combined these two essentials and have produced a machine which stands without a peer for this class of work. The unloading device is very simple and highly practical, operating within a very slight variation of pressure, and the oiling device is thoroughly automatic, efficient and reliable insuring perfect lubrication of all parts without attention. All rotating and reciprocating parts are so well balanced and the entire machine is so rigid that vibrations are practically eliminated and the minimum of foundation may be used.

The class NE—1 is built in Standard capacities of 50 to 300 feet free air per minute.

May we not send you our pamphlet K—92 in which we have reproduced a sectional view of this machine showing all working parts?

CANADIAN RAND CO., LIMITED

Commercial Union Building, MONTREAL, CAN.

Toronto, Cobalt, Winnipeg, Lethbridge, Rossland, Vancouver, Halifax
South Porcupine Spokane Sydney

A Great Market at your door!

WE have prepared a folder telling how you may take advantage of its possibilities. This folder outlines briefly how you may get DAILY ADVANCE INFORMATION of the construction and engineering projects of this Country.

It tells how you may follow up all sales possibilities that offer the most profit and which you can handle to the best advantage.

It tells how this information is gathered by our own reporters and correspondents—it tells how you may have accurate and dependable knowledge before the other man.

It tells you about our Service—how it will help your business—how it differs from anything before attempted in Canada—why it costs more and why it is worth it.

It tells how we can keep you posted on matters of importance and profit to you.

Ask us to mail you a copy.

MacLean Daily Reports Limited

220 King St. West
TORONTO **ONTARIO**

Hercules Waterproofing Compound

Manufactured in
Powder and Liquid Forms
by
The Hercules Waterproof Cement Company
BUFFALO, N. Y., U. S. A.
Distributors in:
Niagara Falls, St. Catharines, Welland, Hamilton, Toronto, Ottawa and Montreal

ABSOLUTELY the only Waterproofing Product on the market giving Impermeability with Increased Tensile and Compression Strength to Concrete.

The report of Mr. Peter Gillespie, Lecturer of Applied Mechanics, University of Toronto, shows by the use of 2% Hercules Compound thoroughly mixed with dry Portland Cement before the addition of sand or water, an average Increase in Tensile Strength of over 10% together with Absolute Impermeability, as compared with the same mix of the Portland Cement without the incorporation of Hercules Compound.

While this increase as shown in Mr. Gillespie's laboratory test is very considerable and makes Hercules a factor in all concrete work,—the result secured by Engineers on cubes containing a 1-3-5 mix, and made after the manner of the construction work for which they were tested, has shown an increase of from 18 to 25%, together with Absolute Impermeability. CAN YOU BEAT THIS

Hercules Waterproofing Compound is not an experiment. We can furnish photographs showing work and furnish letters from Engineers, that positively places Hercules Waterproofing and Strengthening Compound in a class by itself.

Circulars, Catalogues and General Information cheerfully furnished upon request.

For efficient and economical

Weather and Waterproofing

use

Kiton

The Coal Tar which is soluble in water (but once only)!

It can be applied everywhere, to anything, even to

Wet and Cold Walls

No Tar Kettle! No Fire! No Waste!

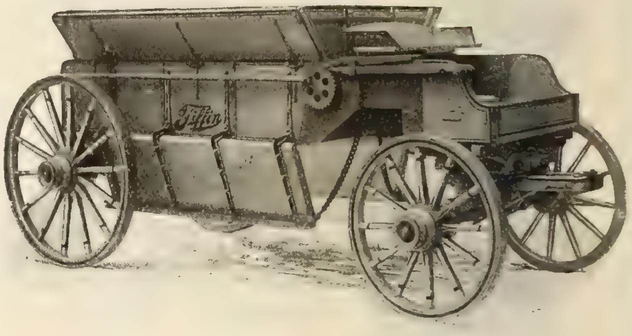
For information write to

F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.

Tiffin Dump Wagons

Flushing Machines, Sprinklers and Municipal Vehicles

are the best builded devices in the United States



The Tiffin Wagon Co.
TIFFIN, OHIO

Armstrong

CRANES

Built for Every Service
up to 75 tons capacity

Electric Traveling Cranes, Standard
Electric Traveling Cranes, Special
Electric Gantry Cranes
Electric Jib Cranes
Hand Operated Cranes
Locomotive Cranes
Hydraulic Cranes

H. J. ARMSTRONG
Engineer and Manufacturer
Markdale, Ont., Can.

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

(Patented)
Autoforce Air Pump Ventilato

Write us for full Particulars

Sole Licensees and Manufacturers for Canada

Gardiner & Gaskill, 505 Power Bldg. Montreal, Que.

Telephone Main 159

Renfrew Lime

Will Make More Mortar per 100 lbs. of Lime Than Any Other Kind

and will save you 75 cents per day on each bricklayer. At the end of a year your savings would pay for the Lime.

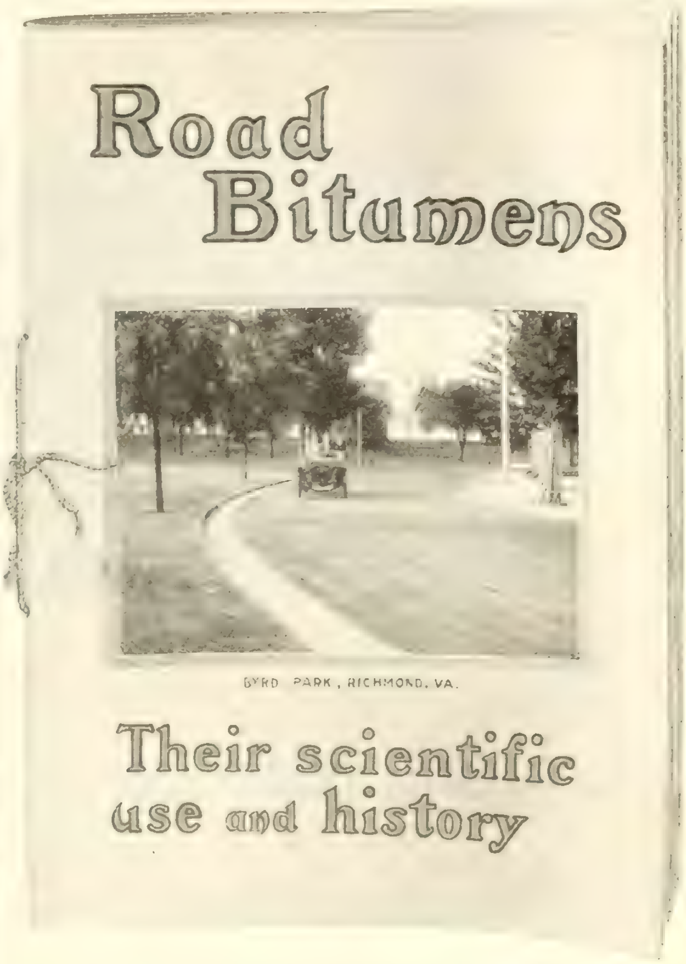
The quality of **"RENFREW"** Lime is very superior and it will pay you to use it.

"Renfrew" the Lime of Quality

Jamieson Lime Co.

RENFREW, ONTARIO

White Lime - Stone - Grey Lime
Brick - Drain Tile



Road Bitumens

BYRD PARK, RICHMOND, VA.

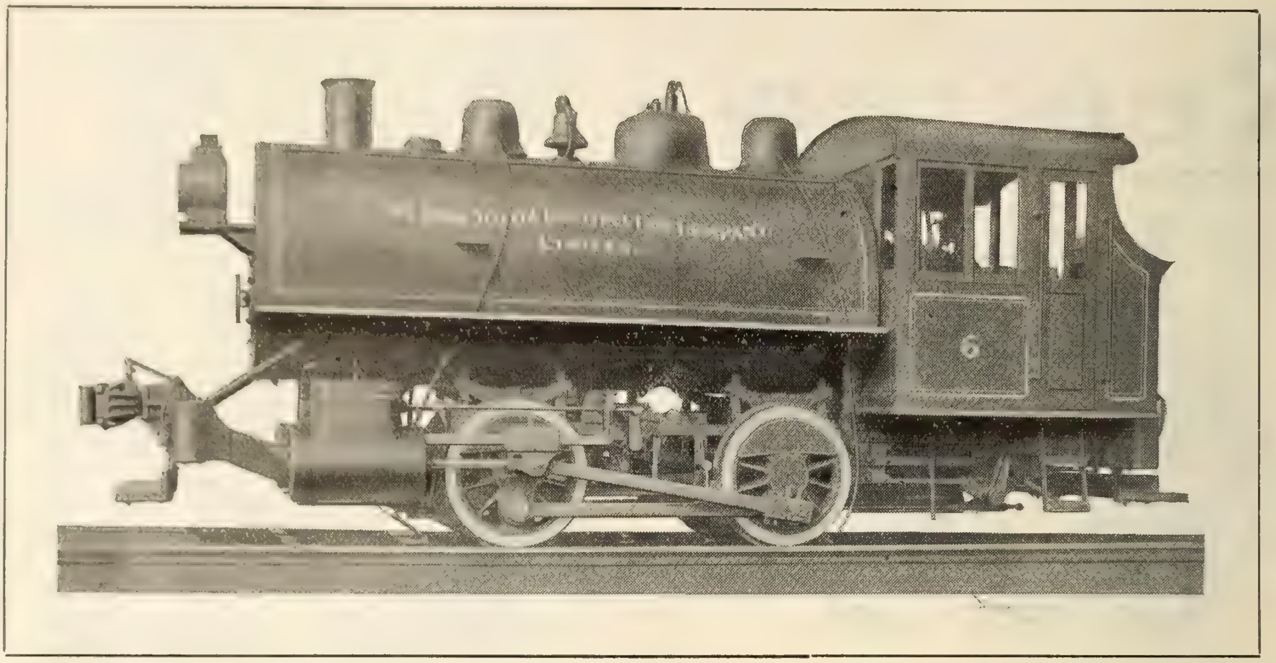
Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a phamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement Company

First National Bank Building
CINCINNATI



CONTRACTORS AND INDUSTRIAL LOCOMOTIVES

The knowledge and experience gained in building locomotives of all types, capacities and sizes for every kind of hauling is applied to every locomotive we build, and is available to you.

Our small locomotives for contractors and light switching service are not merely selected from designs previously built, but are special designs to meet special requirements. They are designed and built with the same care required for 200 ton locomotives. Only the best materials are used in their construction, and every part is made to jigs or templates, guaranteeing that repair parts will fit.

They are constructed with a view to the fact that they must sometimes be operated a considerable distance from shop facilities, therefore simplicity and sturdy construction are vitally necessary.

Fuel cost is always important to contractors. This is considered in the design and capacity of the boiler, and in the design throughout.

Write us concerning your requirements or ask for a consultation with our engineers.

We are in a position to meet every requirement in locomotives and to supply repair parts at short notice from our Works at Longue Pointe.

MONTREAL LOCOMOTIVE WORKS, LIMITED

41 OTTAWA BANK BUILDING, MONTREAL, CANADA

London Automatic Batch Mixer No. 1
Capacity 50 yards per 10 hours.

London Concrete Mixers

are made in all sizes, meeting every requirement. CONTRACTOR, WE DO NOT DICTATE TO YOU AS TO WHAT STYLE OF MACHINE YOU SHOULD PURCHASE, we have EVERY STYLE AND SIZE of mixer required.

London Automatic Batch Mixer No 2. Capacity 25 yards per 10 hour

These machines will be shipped anywhere on approval. WHY PAY A LARGE PRICE FOR CONCRETE MIXER WHEN YOU CAN PURCHASE AN AUTOMATIC MACHINE AT A MODERATE PRICE?

The London Automatic Machines will save you money—
- Cost of Producing Concrete.
- In the First Cost of Mixer.
- Cost of Maintenance.

We also Manufacture—

CARTS FOR CONVEYING CONCRETE BLOCKS AND TILE
WHEELBARROWS; CONCRETE CARTS
FACE-DOWN BLOCK MACHINES; FRICTION HOISTS
CEMENT BRICK MACHINES; POWER HOISTS
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES

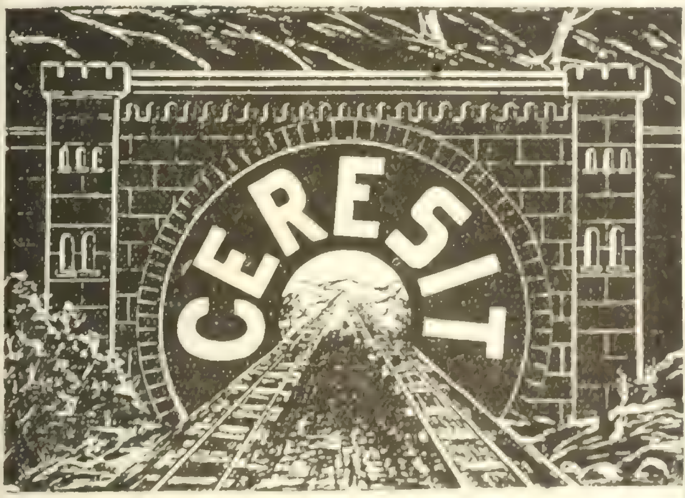
ADJUSTABLE SILL, STEP AND WINDOW CAP MOULDS;
SEWER PIPE MOULDS; FENCE POST MOULDS;
ORNAMENTAL MOULDS; SILO CURBS
CONCRETE CHIMNEY CURBS;
ROCK CRUSHERS;
And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.

London Concrete Machinery, Co., Ltd.

19 Marmora Street, London Canada

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.



No Wet Cellars No Damp Basements

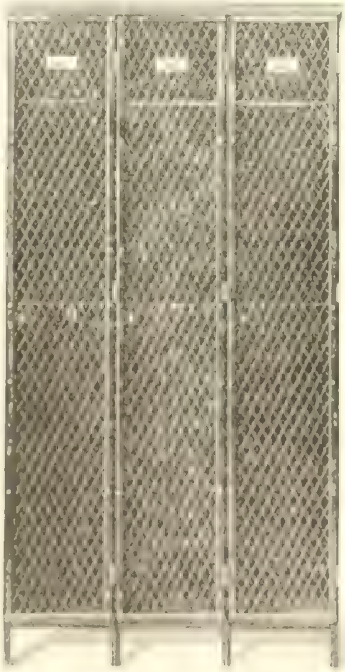
Ceresit is a cream white paste readily dissolvable in water. This water is used instead of plain water for mixing Cement, Mortar or Concrete.

Ceresit Waterproofing Co.

115 Adams Street, Chicago

Canadian Agents
Eadie Douglas, Limited
Montreal, Toronto, Ottawa
[illegible] Limited, Winnipeg
[illegible] Vancouver

The Up-to-Date Building



Should be equipped with metal lockers for the safe and sanitary keeping of clothing.

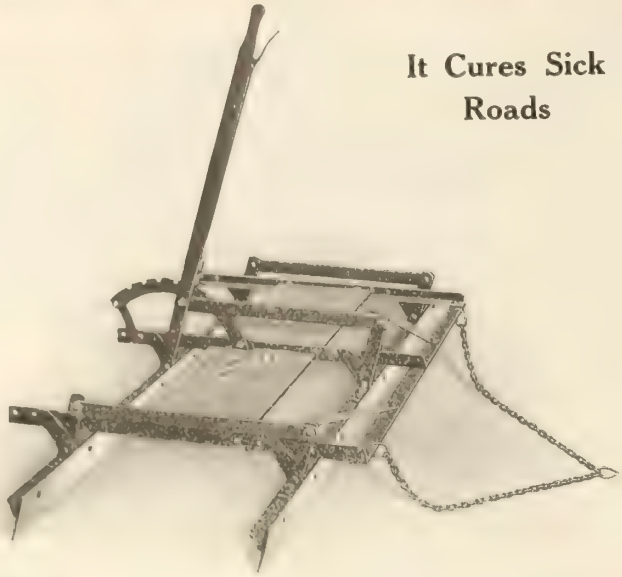
If you appreciate good value and rigid construction in a locker, you will use MEADOWS' METAL LOCKERS on your next contract.

Send for our illustrated booklet entitled
"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co. Limited
TORONTO, CANADA

Abrico Road Drag No. 1



It Cures Sick Roads

Patented April 28, 1908

Length 8 feet. Width between blades 30 inches. Blades 6 inches. Weight 300 pounds.

Do you want nice smooth roads?

This Drag will take out all of the **bumps** and fill up all the **ruts.**

It is of steel construction and is adjustable, both forward and backward, and can be operated by one man and team.

Do not let distance keep you from having one.

Your order by mail will be given careful attention.

Manufactured by

Attica Bridge Company

Attica, Indiana, U.S.A.

Canadian Representatives desired. Write for special terms.

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

THE STANDARD

COMPANY LIMITED

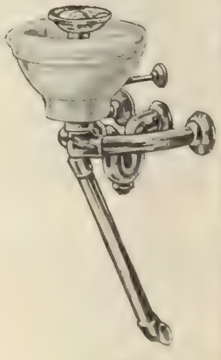
GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

F. 290

Contagious diseases are spread by drinking out of contaminated glasses, cups and similar vessels, for in that manner one comes in almost direct contact with the mucrious membranes of preceeding drinkers.

With our Porcelain Enameled Bubbling Drinking Fountain the drinker cannot touch the cup; he gets a drink of running water with more security than from a fire clay fixture as our ware is positively non-absorbent.

Advocate these fountains and reduce the spread of contagious diseases.



F. 292

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1888

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 May 17, 1911 No. 20

Expert Report on Toronto's Defective and Unreasonable Building By-Law

For some months it has been known that a Citizens' Committee, comprised of representatives of the architectural, engineering and business interests of Toronto, has been preparing a memorial to the Mayor and Board of Control requesting a revision of the Toronto Building By-law. As will be seen by a list given in another column, this committee numbers among its members some of the best known architects and engineers of Toronto, and for this reason its findings have been awaited with much interest by all those identified in any way with building operations. After some seven months' exacting and gratuitous work the conclusions of the committee have been embodied in a memorial (abstracted in this issue) which was presented to the Mayor and Board of Control on Tuesday, May 16th.

The investigations of the committee reveal a most interesting state of affairs in regard to building construction in Toronto. The by-law is shown to be objectionable from innumerable standpoints. It must not be imagined that the objections are all on the ground of undue severity, for many instances of remarkable laxity are cited; moreover, the present ordinance is incomplete and badly edited—shortcomings which result in the greatest inconvenience and much loss of time to those who are obliged to consult it.

The grounds for the conclusions of the committee can of course only be appreciated by a careful perusal of the memorial, which has now been made public property. The majority of our readers will find the report of outstanding interest, in that it discusses clearly and intelligently, fairly and fearlessly, matters of vital concern to constructional interests which heretofore have received all too scant attention. The conclusive evidence brought to bear on the high cost of building, discussed in Part I., cannot fail to provide the civic authorities with food for careful reflection —we were going to say uncomfortable reflection— and this is only one of a hundred reasons which justify the committee's application.

With the authoritative statement of a large committee, composed principally of expert architects and engineers, that the by-law is so remarkably defective, there can surely be no room for argument as to the necessity for revision.

It scarcely seems possible that the civic authorities will set aside or refuse the application, and for this reason it is timely to consider the most approved method of securing a revised and up-to-date by-law. In other cities this has been found to consist in the cooperation of a number of experts making up a small commission. Large commissions, comprised of a dozen or more members, are unwieldy, slow and inefficient, this being attributable to the fact that the numbers are generally made up by padding. In a work of this sort no one has any place on a commission who is not an expert in some particular line or lines dealt with in the by-law. The city of Toronto may be assured that in the framing up of a new code the best results will be obtained from a small commission of some four or five members, inclusive of the City Architect.

It would be impossible to speak too highly of the self-sacrificing work of the men who have prepared this memorial, and whether they think it or no, the Mayor and Board of Control—in common with the rest of the city—are under a great obligation to the committee for this comprehensive and valuable work. As far as we know, the investigations of the committee and the compilation of the report—gratuitously, as it has all been, is quite unprecedented. That it was brought about by repeated failures to secure revision by ordinary means only enhances its present value and makes it the more final. The city has the memorial and it has the list of those who compiled it, and this should be sufficient to warrant the work of revision.

The Contract Record congratulates each member of the committee upon his share in the prepartion of such a historic memorial and in particular the Secretary, Mr. C. R. Young, upon the lucidity and general arrangement of the various sections.

Reinforced concrete piles spaced 10 feet apart, were used for the extension of a timber quay at Ipswich, England. Some of the piles were 14 x 18 in. and the rest 14 x 14 in.; they averaged 30 feet in length and were reinforced by a rod in each corner, the rods being tied together. The piles were driven through gravel and one of them required to be struck 2,000 blows with the 2-ton pile driver hammer.

The set of uniform symbols which has been devised by the Architectural Club of Minneapolis, for use by architects generally, is a great step in the right direction, says the Improvement Bulletin. The symbols favored seem to have been worked out with much care as to their practicability, and they deserve serious and careful consideration. The amount of time wasted through uncertainty, the errors of figuring caused by misunderstanding plans and the trouble which the architects, owners and builders all encounter through these misunderstandings, all show the [illegible] need of standardized [illegible].

A Noteworthy Building Project at Toronto

Features of Interest in the Erection of the General Hospital—Activity at the Scene of Operations Don Valley Brick Works' Big Contract

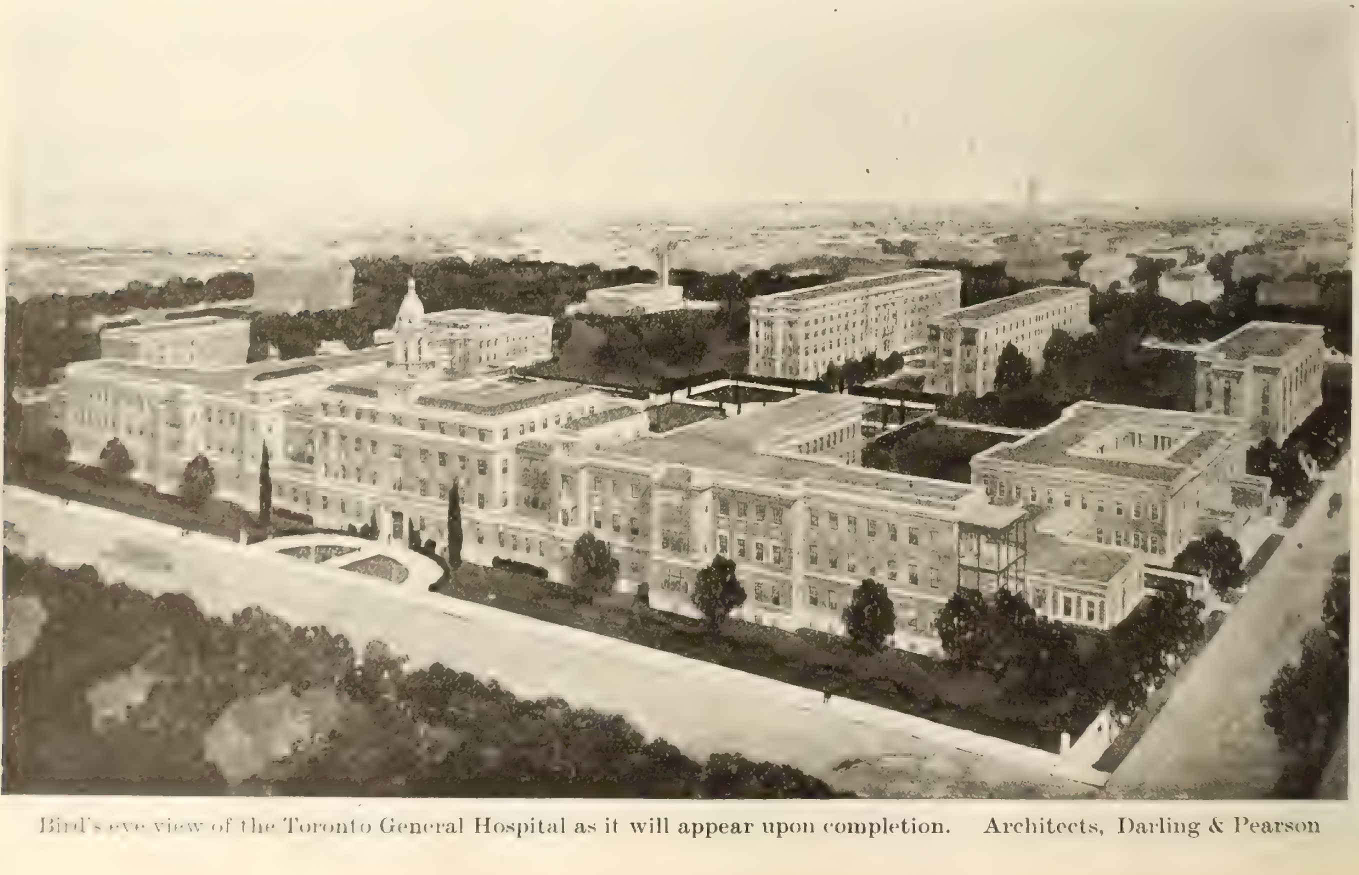
At a first glance the view shown on the opposite page might be mistaken for a souvenir of the ruined cities of Pompeii and Herculaneum; but in place of a ruined city of the Old World it is an embryo city of the New—a city in the upbuilding, a city of brick, which will be known as the Toronto General Hospital. During the last few years many noteworthy contracts have been carried to completion in Canada and numerous buildings in our principal cities stand as a monument to the enterprise and ability of Canadian institutions, but it has remained for the city of Toronto in its present undertaking to take the palm of the Dominion for a set of hospital buildings which will be not only unequalled in Canada, but approached by very few other similar institutions in the world.

While the above-mentioned photograph is the best obtainable it conveys quite an inadequate idea of the extent of the work—which will be readily understood when it is recalled that the buildings cover a site of no less than ten acres of ground. The estimated cost of this noteworthy group of buildings is $2,500,000. The location—three minutes' walk from the corner of College and Yonge streets, is central and appropriate. The exact dimensions of the site are 600 by 700 feet.

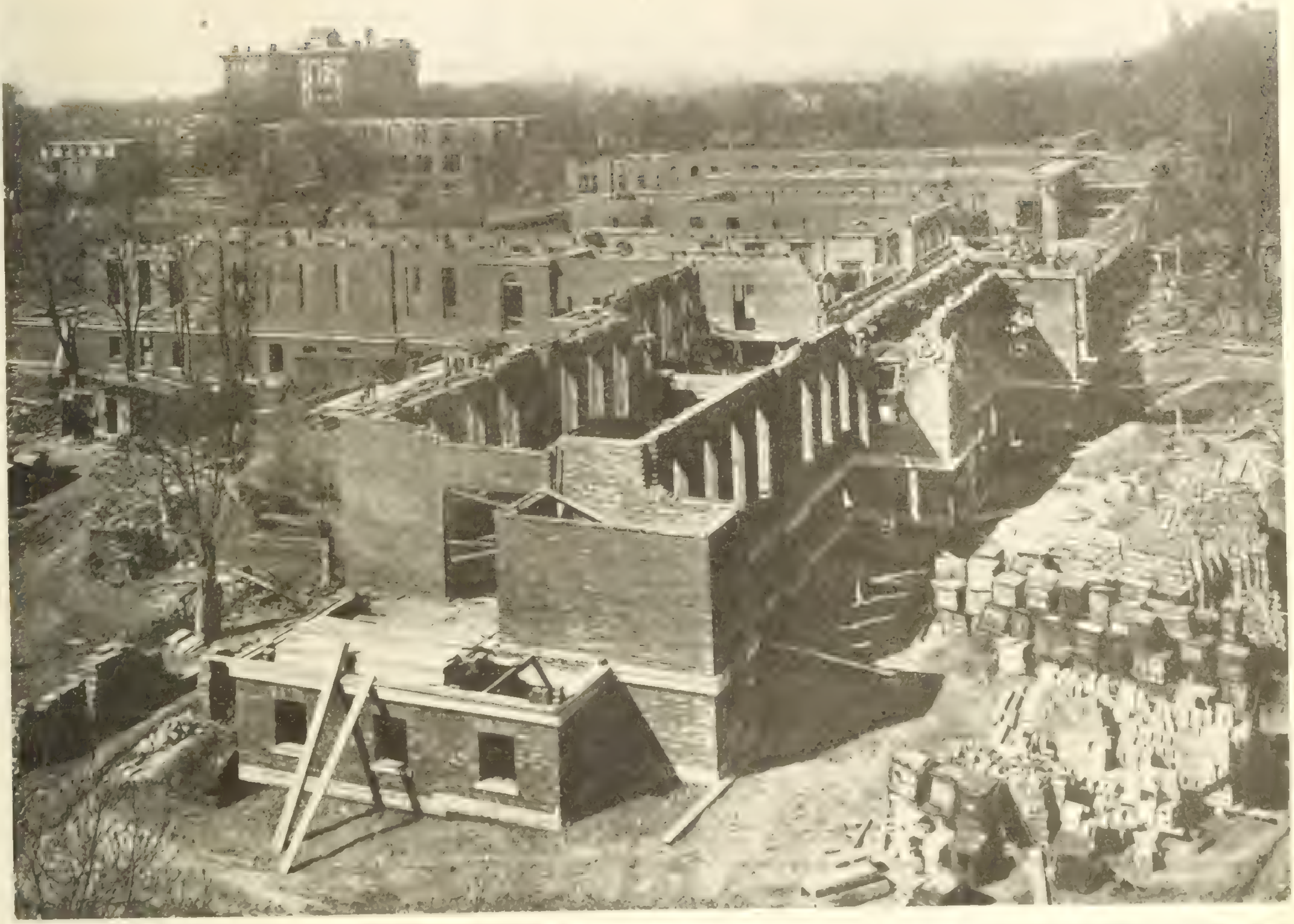
The general scheme consists of an Administration Building, with entrance on College street, flanked on one side by the Surgical wing and on the other by the Medical. The Out-Patients' department and Emergency Building are approached from University avenue. South of this building is the Pathological Building, while at the south of the property, along Christopher street, are the Nurses' Home, a private patients' building, and to the east, on Elizabeth street, the Obstetrics and Servants' Buildings. The power plant and laundry are located at the southeast corner of the property.

The Administration Building is to be four storeys high and will form the main entrance to the hospital. The contract for the erection of this building was awarded to H. N. Dancy & Son, Toronto. Other contracts now in hand were awarded as follows: Surgical Wing, Thomson Bros.; Medical Wing, Holtby Bros.; Out-Patients' and Emergency Building, Witchall & Son; Pathological Building, R. Robertson & Sons, Limited; Nurses' Home, Teagle & Son; power house, Self Bros.

The contract for the whole of the brick and porous terra cotta fireproofing which is being used in the construction of the buildings was awarded to the Don Valley Brick Works, Toronto. No less than twenty million brick will be required. The brick specified is a semi-vitreous variety which has been named by the manufacturers, the "J. A. P." This brick was designed especially by the Don Valley Brick Works to meet the particular requirements of the hospital contract. It is made in Roman length and standard depth, oriental faced, and has a pronounced contrast in colors ranging from flecked golden to deep-



Bird's eye view of the Toronto General Hospital as it will appear upon completion. Architects, Darling & Pearson



The above photograph conveys an idea of the excellent progress that has been made to date on the Toronto General Hospital

est bronze and purple. The Don Valley people, with their customary enterprise, installed special machinery in order to obtain the best results, both in regard to the manufacture of the brick and the expediency of its delivery. A description of the Don Valley Brick Works was published in our Special Brick Number of December 7, 1910.

The Don Valley industry was practically indispensable to the successful completion of this great undertaking. Certain it is that only such a plant could meet the demands of such a contract. This is emphasized by the fact that the leading brick manufacturers of the world competed for this contract and that in face of this the "J. A. P." brick from the Don Valley was chosen, owing to its superiority in every point of comparison.

When His Excellency, Earl Grey, laid the corner stone of the Toronto General Hospital a month ago, he referred to the undertaking as one which marked a new epoch of development in hospital work in the Dominion and said that he would always consider the privilege of placing the stone the greatest honor accorded him during his term of office.

Lage stone ballast on a considerable extent of track reballasted by the Missouri Pacific Railway, has been reworked with an addition of smaller stone with the result that the roadbed has become practically a macadam surface. The track has been raised sufficiently to put the coarse rock below the bottom of the ties, and the filling between the ties, and for about an inch below them, made with smaller material, which is more cheaply worked. Other similar experience of this road has shown that a 6-in. stone can be used to good advantage if mixed with other finer material, as in the construction of a highway, according to Mr. M. L. Byers, chief engineer maintenance of way, in a discussion before the American Railway Engineering Association.

An Italian engineer has devised a protection river embankment with concrete blocks strung on wires. The blocks are like big bricks, which interlock one with another top and bottom and at the ends. Each carries six holes so that for every ten feet of space there are 25 holes. When the river bank has been smoothed 25 wires for every 10 feet on the bank are stretched from a stout cable down in the water five feet under the surface of the embankment to a temporary bench at the top. Then the blocks are strung upon the wires, six wires passing through each block and slid down the frame at the top of the embankment to the cable in the river. When the curtain is completed the bench is removed, the wires twisted together at the upper ends and made fast to posts fixed firmly in the ground. The lower part of the curtain in the water is held down by its own weight.

Various Methods of Awarding Contracts

Respective Merits of the Several Forms in Use—Objections to Lump Sum Bidding Fundamental Considerations in Successful Construction

By Daniel J. Hauer

There are a number of different forms and methods of letting contracts. Some few have been used but little, while some of the others have been in use ever since contracting has been in vogue. There are in all some eight or ten methods of letting work, but they are all some variation of the following well defined methods:

1. Contracts let on the unit basis.
2. Contracts let for lump sum.
3. Contracts let on a percentage.
4. Contracts let for cost plus a fixed sum.

Under these heads come the many variations, such as the two ways payment, percentage bidding, keeping within certain percentages, force account contracts, and lump sum and percentage work. Some of these are not necessarily different in form, only in the methed of bidding on the work, but this difference in the end means a variation in the manner of obtaining and carrying out the contract.

1. Contracts let on a unit basis, is one of the oldest methods of letting work, and although there are some objections to it, yet this method present many advantages.

Unbalanced Bidding

Many of the forms of bidding and of contracts that have been tried within the past twenty years, have been originated almost entirely to overcome the objection of unbalanced bidding, under the unit basis method. Unbalanced bidding has been carried to extremes, especially in connection with city work. For laying pipe for instance, contractors have been known to bid an extremely high price for pipe per ton delivered and only one cent per lineal foot for excavating, refilling the trench and laying the pipe. Also on paving work, contractors have frequently bid one cent per lineal foot for furnishing and laying curb, and then added to the other items of work the deficiency on the curb. In the pipe work, it is very evident that the bid is gotten up in this unbalanced manner, so as to have a high price for material delivered and obtain large payments on the contract before any of the work is done. This sometimes allows a dishonest contractor to collect nearly all the money due on his contract and then refuse to do any more work. On street work it is evidently the intention to hide the prices bid on the various items of work. These are all tricks, and cannot be defended even from the contractor's standpoint. There is another method of unbalancing bids, for which a defence might be made. A contractor in bidding on a job notices a small item of work listed in the preliminary estimate and upon investigation arrives at the opinion that this class of work will greatly increase, and accordingly bids a price slightly higher than he would otherwise have done. This class of work does increase, with a corresponding decrease in the cost of doing the work, with the result that a very handsome profit is realized on this one item of the contract. The writer remembers a case of this character. A contractor bidding on a large railroad contract noticed that there was an item of a few thousand feet board measure of timber guards to go at the ends of embankments at pile bridges on timber trestles. There was a large number of bridges, and the contractor reasoned that if timber guards were necessary for a few openings, that they would be needed at most of the bridges. He accordingly bid a price that was a little higher than ordinarily paid for such timber work. After construction commenced, the contractor's surmise proved correct, with the result that he made a large profit on these timber guards, much larger than on any other item of the work. In a measure the contractor was entitled to this as he was able to size up the situation quicker and better than the engineer, who had planned the work. It was a case of matching one man's wits against another, and the contractor won.

The unbalancing of bids is a benefit to the individual contractor, but in the end it works a hardship on the contracting business. It is against all economic laws, and contractors should assist engineers in preventing unbalanced proposals from being made. It might be termed a petty form of graft, as excessive payment is made for work, thus obtaining more than a recognized or legitimate profit.

The Unit Price Method

In discussing the unit price method of letting work, this objection to it must be kept in mind. Contracts let on this basis consist in estimating all classes of work to be done, setting a unit for measurement and payment at the stipulated price. When all classes and quantities of work are found or estimated, then by applying the unit prices, it is possible to know the cost of the work before it is started, but if all quantities of work to be done are not known the exact cost cannot be obtained until the job is finished. If changes are made in the plans during the progress of the work, the contract is not affected, as the unit prices remain unchanged and an increase in quantities is paid for at the stipulated rate while a dimunition will not increase the cost. It is possible under this form of contract, provided prices have been named for every class of work to be done, to do the job without bills for extras.

The item of extras is one over which many a law suit has been fought. When work does not come within the contract it is done as "force account," and is charged extra. Some contractors like force account work, but it would be better for the profession if it could be entirely eliminated from construction work. To obviate having extra work, a price should be named for every description of work that may be encountered, even though the engineer's estimate may not include all such items. Two classes of work should not be included under one price, but a strict unit basis should be maintained throughout the specifications and contract. The hauling and delivery of materials can also be arranged for under the unit system. Hauling can be paid for per ton mile, or on a similar basis. Materials can be paid for first as delivered and then in place. With only a price for materials in place, contractors may be slow in providing it, while if the owner should furnish the materials the contractor will more than likely be extravagant with them and negligent in caring for them.

A "two-way payment contract" is a unit basis contract, but instead of paying for the work under one heading, it is paid for under two items. This method was very common at one time for excavation and is still used to a limited extent. Thus when earth is excavated and placed in an embankment, instead of setting one price to cover the entire operation, a price is set for excavation, and another for placing the material in the embankment, thus making a two-way payment. However, if the material is excavated and wasted, or if material has to be borrowed for embankments, only one payment is made. There is little to recommend this method except in unusual conditions.

A good many public contracts are let on a unit basis, but the units of work selected often consist of several items or classes of work. Thus under the head of concrete, such work as excavation, pumping, shoring, and the concrete is paid for as one item. Thus, if any of this work is not needed, as the pumping or shoring, then the contractor is paid for work he does not do. Then too, it is to the interest of the contractor to make his excavation excessive so as to receive pay for extra concrete. This could happen if each item were paid for separately, but it is not as likely, as the excavation must then be measured by the engineer, and he in checking up the work in this manner, will prevent such conditions.

In letting work on the Barge Canal in the State of New York, bids are taken on a unit basis, and in order to prevent the bids from being unbalanced, the state engineer's estimate of the cost of doing the work is published and given to a contractor before he makes his bid. He is then told that his bid will be considered informal and rejected if his bid varies more than ten per cent. from the engineer's estimate in the total, and twenty per cent. on any one item. This method has not proven satisfactory in every respect, but it has been a step in the right direction, and has so far been such a help in preventing the unbalancing of bids that it has been continued in letting the work.

The unit basis form of contract is especially adapted for railroads, canals, bridges, reservoirs, dams, ditches, walls wagon roads, streets, sewers, conduits, tunnels, subways, filter beds, pipe lines, transmission lines, all forms of excavation and many other kinds of outdoor construction.

Contracts Let for Lump Sum

2. Lump sum contracts are those for which the contractor agrees to complete such work as is listed in the contract and specifications and shown on the plans for a specific amount of money. In this form of contract every detail must be thought of before bids are asked on the work and plans and specifications must be complete or else the lump sum will not be binding to either party of the contract.

Lump sum contracts are very popular in some sections of the country and on certain classes of work. Many engineers seem to prefer this form of contract, but the writer believes that contractors as a class have a decided preference for unit price contracts. This preference was shown at the first letting of work on the 1,000 ton Barge Canal of the State of New York. Contractors were asked either to submit itemized bids or lump sum proposals. Most of the contractors bidding, gave unit prices. The director of public work, before making the final awards submitted the merits of the two methods to special board of engineers, who decided it was for the best interests of the state to accept only unit price proposals.

The fundamental basis of all successful construction is that the labors of the engineer should be complete and comprehensive, and the most skilful and artistic planning, consistent with economy be shown. This fact controls all bidding. The general public has become so accustomed to reading, in regard to public work of large bills of extras, or the cost of the work being done, exceeding the estimates, that the public has turned to lump sum contracts as the preventive of this practice, but this is not necessarily the remedy. Should an engineer's estimate of the work be complete in every detail, and the the same time so designed as not to admit of improvements being made as the work progresses, then either unit prices or a lump sum contract should give the same results as to costs, and there could not be any extras to be paid at the end of the job.

This is based on the supposition that the engineer's estimate is complete, but both engineers and contractors have experienced that these estimates are seldom verified by the costs of construction, consequently when a contractor makes a lump sum bid, he must add a percentage to cover the small changes and chances of increased costs, for which a claim for extras cannot be made after the job is finished, thus adding to the cost of the whole work. Such a percentage is not needed when the contract is based on unit prices, as the contractor does not assume the same risks.

This form of contract is objectionable, as every dollar that the contractor saves on the work goes into his own pocket and changes made to cut down costs do not necessarily mean a saving to the owner. It is difficult to live up to a time limit with this form of contract, as almost any changes in the plans will make the limit set of little value.

Objections to Lump Sum Bidding

The following are some of the reasons that should carry weight against lump sum bidding:

(a) Unit prices are not named in the contract for increased amount of work that may be made necessary by changes in the plans, or caused by incomplete surveys. Nor can money be deducted for decreasing the amount of work. Allowances made by the engineer for changes in most cases would not be satisfactory to contractors, causing disputes when these parties disagree, frequently ending in suits at law.

(b) Contractors object to this method as a specific sum is not stated in the contract to be paid as a monthly estimate, as is the case in a unit price contract, but the amount is left to the judgment of the engineer, who is more likely to underpay than overpay the contractor.

(c) To ask for lump sum proposals may in itself be a confession of incomplete surveys and hastily made estimates.

(d) This risk and all others, the contractor must run, and as he has to assume the entire responsibility, he must ask an increased price to cover it. He has his money and property at stake and must protect them. The contractor under this system, is expected to check in a few days, all surveys and estimates, that it may take the engineer months or years to make. As it is not possible to do this, he must add to his price to cover the possible errors made by another. Under the unit price method he studies the cost of each item, bids accordingly, and the company letting the work pays for it as it is actually performed under the supervision of their engineer, and as the work progresses.

(e) Lump sum bids, not setting unit prices, cause all extra work to be done by "force account." Men do not give as efficient work unde this system. The contractor may not object to this, but the engineer should. Then too, on public contracts of any size this may be a prolific cause of charges being made of fraud between the engineer and contractor, when none really exist.

(f) On lump sum work the personality of the engineer counts for much, hence to change engineers after the contract work is under way means a hardship to the contractor. This fact may also limit the number of bidders on a job, as many contractors do not care to have lump sum contracts under engineers they do not know.

This form of contract is much used for buildings, the furnishing and setting of machinery, the construction of sewers and water supply plants, the construction of power plants and many other jobs. It is frequently resorted to for irregular work.

The National Government lets a large number of lump sum contracts and in order to vary from the established amount of work to be done, they ask the contractors to name unit prices for additional work that may be necessary and also prices for work that may be omitted. As a rule, contractors name a higher unit rate for additional work than for work to be omitted. This in itself shows that it would be more economical to let the work on a unit basis.

Contracts Let on a Percentage

3. The percentage plan of letting contracts is also known as "force account work" and consists in doing construction under a contract, at a cost for labor and materials, plus a fixed percentage for superintendence and profit. This percentage varies from five to twenty-five per cent—it is generally ten per cent. This percentage is too low. When but little machinery was used on construction work, ten per cent. was ample for tools, superintendence and profit, but with expensive machinery another ten per cent. should be added.

When it is stated that the more the work is made to cost, the greater is the profit of the contractor, it is at once shown that this method of doing work is objectionable, and counter to all business principles. Yet much work is done under this form of contract. However, there is not a class of work done under this method that cannot be done under some other.

This method must not be confused with "percentage bidding," which is a method now being used by a number of cities to prevent unbalancing bids. It is a variation of the unit price method. The engineer makes up an estimate of work to be done, setting down unit prices for each item. This estimate is given to the contractor who bids a per cent. of the prices named, and the contractor bidding the smallest per cent. is awarded the work. It is also possible to have percentage bidding on lump sum contracts.

Cost Plus a Fixed Sum

4. The cost plus a fixed sum contract, is a variation of number 3. The owner pays actual cost for all labor and materials and in addition a fixed sum as profit to the contractor, who brings his organization and knowledge of construction. By this method each party knows in advance the profit to be made, but the total cost of the work need not be known and seldom is. There are advantages and objections to this method. Some of the advantages are: the owner's and contractor's interest should be identical, as to increase the cost will not add to the contractor's profits. The owner must pay the entire cost of the work as the contractor risks neither his time nor his money, as he does under the lump sum method. There cannot be disputes as to extras, as they cannot occur. Changes can be made in plans and specifications when ever it may suit the owner. Work can be started before all the plans have been made. Likewise the owner can take possession of any part of the work at any time and not wait for the entire job to be completed. The incentive of the contractor should be to do the best class of work and to do it as rapidly as possible. The fixed sum charged is generally about ten per cent. on the total estimated cost of the work, but should the work cost more or less than the estimate, the contractor's profit still remains fixed.

One objection to this style of contract is that the contractor ceases in the true sense of the word, to be a contractor, as he becomes a labor agent and a superintendent of construction for the owner. This form of contract also creates a tendency to take from the engineer and architect certain work that is rightly theirs and also rob them of prerogatives. Differences can arise between the owner and his engineer or architect caused by the position taken by the contractor.

The contractor may be placed in an unusual position as to buying and using outfit, as in cases where special machines are needed the owner would not be willing to pay the entire cost of such machines, and the contractor would not wish to purchase as he may never have use for them again. Thus the job may be done without proper machinery. The contractor is liable to gain a bad name in the labor world, as, at the command of the owner, he is compelled to mass large numbers of men on a piece of work for short periods of time, and then must discharge them as soon as the material is used up. It is but natural that men should resent this. Under other methods the contractor maintains a force of men that he can work economically at all times. The cost plus a fixed sum method has a tendency to throttle competition, as the nature of the contract is more of a deal for each job than a proposal and competition bid. It is a case of calling in a contractor and offering him the work.

The cost plus a fixed sum method is used for all classes of work, but if it has any special merit, it is in foundation work, and other construction where it is very difficult to estimate the work to be done, and also to keep a record of the work as it is accomplished.—The Contractor, Chicago.

Ozone Plant at St. Petersburg, Russia

A new ozone plant and mechanical filters have been installed at St. Petersburg, Russia, to purify a portion of the water supply of that city, which had formerly been pumped from the Neva River without undergoing treatment. The municipal supply is furnished by three waterworks; the largest one includes a sand filtration plant, while the other two used the raw river water. At one of the latter the ozone plant and filters were built and put into operation at the beginning of the present year. The plant serves a district in which the daily consumption of water amounts to 13,200,000 gal.

The river water, according to an article by Dr. G.

Erlwein in "Metallurgical and Chemical Engineering," contains a large amount of suspended matter and before reaching the filters coagulation with sulphate of alumina and sedimentation in eight basins are employed. The rapid filter plant comprises 38 units of the Howatson type, which are similar to the American Jewell filters. The filter effluent passes directly to the ozone sterilization towers, a small amount being reserved as wash water.

The ozone plant comprises 128 Siemens & Halske ozonizers of the tube type and 5 sterilization towers. Before entering the ozonizers the air is dried by a refrigerating plant in order to increase the yield of ozone. Otto injectors, operating at a water pressure of 14 feet, suck the ozonized air from the ozonizers and drive it, mixed with water, to the sterilization towers. The absorption of the ozone and the sterilization of the water occurs partly in the injectors at the top of the sterilization towers and partly in the towers in which the ozonized air rises from the intitom in a finely divided state and is brought into intimate contact with the water. From the towers the water passes over cascades to remove the air and into a pipe line leading to a storage tank for pure water, from which it is pumped into the supply lines of the city.

For the operation of the whole plant a special electric station has been erected, containing boilers, steam engines and three-phase generators. By means of three high-frequency converters the three-phase currents produced in the generators are brought to a frequency of 500 periods, for the ozonizers require a high-frequency current. The current is transformed up to a voltage of 7,000, the operating voltage of the ozonizers. The power plant contains two steam engines, each of 150 h.p., direct connected to three-phase generators; a third machine is held in reserve. The electric current is used not only for the ozone plant, but also for driving the stirring devices, wash-water pumps and the other machinery of the mechanical filtration plant.

The cost of operation, including the cost of aluminum sulphate and rapid filtration, is said to be from about $15 to $17 per 1,000,000 gal. Ozonization is said to amount to about one-half of the total cost. The bacterial content of the treated water, according to Dr. Erlwein, varies from 0 to 3 per cubic centimeter; pathogenic bacilli are not present in the effluent of the plant. The plant was installed as the result of experimental work conducted on a large scale by a committee of Russian bacteriologists and sanitary engineers; the experimental plant had a capacity of about 26,418 gal. per hour.

A Goat Story

Eighty Angora goats put to work by the Puget Sound Electric Company in clearing its right of way between Seattle and Tacoma are making good progress. They are moving in the direction of Seattle at the rate of a mile a month, devouring the underbrush and attacking the roots of shrubbery along the right of way of the interurban system. The company put the army of Angora goats to work four months ago, and the experiment has proved an absolute success. Their work has been so thorough that they will not have to repeat the trip over the 26 miles of right of way. At the present rate at which they are grazing along the interurban road they should reach Seattle in about a year and a half.—Porland, Ore., Press.

Tests of Hollow Building Bricks from Medicine Hat

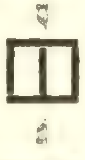
Highly successful results were obtained by Professor Brydone-Jack, professor of civil engineering in the University of Manitoba, upon a test of some hollow clay blocks submitted by Mr. Hook for the Alberta Clay Products Company, of Medicine Hat., Alta. Through the courtesy of Mr. A. K. Grimmer, city engineer of Medicine Hat, we are enabled to give the following details, which will doubtless be of interest to many of our readers:

University of Manitoba

WINNIPEG CANADA.

April 5th. 1911

Compression tests made on hollow bricks, submitted by Mr. Hook, for the Alberta Clay Products Co., Medicine Hat, Alberta.

DIMENSIONS	Load required to produce crack Pounds	STRESS REQUIRED TO PRODUCE CRACK		Breaking Load Pounds	BREAKING STRESS		REMARKS
		Pounds per sq in	Pounds per sq ft		Pounds per sq in	Pounds per sq ft	
8"x8"x16"	88000	830	119500	140800	1330	191500	Load was applied to these specimens as shown below 
" "	46000	422	60700	176780	1620	233000	
" "	83000	760	109400	95040	870	1252[illegible]	
6"x8"x12"	29000	287	41300	96550	[illegible]	137[illegible]	
" "	77000	762	109800	109580	1084	[illegible]	
" "	53000	512	73700	124990	1210	174000	
5"x8"x12	13000	124	17800	91870	875	126000	
8"x8"x16"	67000	2050	295000	121800	3740	538000	Tested on end
5"x8"x12"	52000	2970	427500	92670	5300	763000	" "
4"x12"x12	39000	1680	242000	49430	2130	306500	" "
5"x12"x12	57000	2880	415000	79070	[illegible]	575000	" "
6"x8"x12"	13000	204	29400	53000	832	119800	Tested on edge
4"x12"x12"	13000	238	34250	31650	578	83200	" "
3"x12"x12"	7000	172	24800	23[illegible]	574	82600	"

NOTE.—Unit stresses are calculated from the full bearing area.

(Signed) E. BRYDONE-JACK.

April 6th, 1911. *Professor of Civil Engineering.*

Four waterproofed reservoirs, built by the El Paso Southwestern Railway a year ago, have given satisfactory service as the result of surface treatment of the concrete linings. The depth of water is 12 feet. Soap and alum were first used in coating the lining, which was 4 to 6 inches thick. Two coats of each were applied, beginning with the soap, and alternating. Hot asphalt, or cold prepared asphalt paint, was then put on the surface. Some trouble was experienced in making the asphalt adhere permanently, probably due to the fact that the surface was smooth and glossy as a result of the alum and soap treatment. The prepared asphalt paint adhered more firmly, however, and proved generally satisfactory. The work was done on the basis that dense concrete, rich in cement, is the primary requisite for watertightness. The treatment was selected after tests to determine the qualities of the soap and alum solutions and the asphalt and paint.

Traffic on Canadian canals during 1910 amounted to 42,503,305 tons, an increase of 9,857,407 tons as compared with 1909. The increase in tons occurred in the following canals: The Soo, 9,155,503; Welland, 313,166; St. Lawrence, 335,754; Ottawa, 43,204; Rideau, 43,107; St. Peters, 746; Murray, 62,693. Decreases in tonnage for the year of 82,818 and 13,918 are reported for the Chambly and Trent canals respectively.

Criticism of the Toronto Building By-Law

Abstract of Memorial Presented to the Mayor and Board of Control by Expert Investigating Committee—A Defective and Unreasonable Code

The following pages contain an abstract of a memorial presented to the Mayor and Board of Control of Toronto on Tuesday, May 16th, by a general committee of citizens representing various technical and business organizations, requesting a revision of the Toronto Building By-law.

The following is a list of members of the General Committee:

Toronto Branch of the Canadian Manufacturers' Association
W. C. Phillips, Phillips Manufacturing Company.
J. P. Murray, Toronto Carpet Manufacturing Company.
Thos. Roden, Roden Bros.
Geo. Brigden, Brigden's Limited.

Ontario Association of Architects
H. B. Gordon, Gordon & Helliwell, Architects.
Murray A. White, Burke, Horwood & White, Architects.
Edwin Menges, Reid & Brown, Structural Steel Works.

Toronto Society of Architects
C. H. Acton Bond, Bond & Smith, Architects.
~~J. C. B. Horwood,~~ Burke, Horwood & White, Architects.
C. D. Lennox, care E. J. Lennox, Architect.

Engineers' Club of Toronto
C. M. Canniff, Fielding & Canniff Company.
L. J. Street, Vice-President Canadian Inspection Co.
C. R. Young, Barber & Young, Structural Engineers.

Toronto Branch of the Canadian Society of Civil Engineers
Dr. John Galbraith, Dean of the Faculty of Applied Science and Engineering, University of Toronto.
A. W. Connor, Bowman & Connor, Structural Engineers.
C. W. Noble, Contracting Engineer.

Canadian Cement and Concrete Association
Peter Gillespie, Lecturer in Applied Mechanics, University of Toronto.
Gustave Kahn, Director, Trussed Concrete Steel Company of Canada, Walkerville
Robert F. Havlik, Engineer, Ideal Concrete Machinery Company.

Builders' Exchange
R. L. McIntyre, McGregor & McIntyre, Structural Steel Works.
Arthur Dinnis, Richard Dinnis & Son, Contractors.
John Aldridge, Contractor.

W. F. Evans, Engineer, Steel & Radiation, Limited.
A. H. Gregg, Wickson & Gregg, Architects.
A. H. Harkness, Structural Engineer.
W. Ford Howland, Langley & Howland, Architects.
T. Harry Mace, Structural Engineer.
J. Morrow Oxley, Chief Engineer, McGregor & McIntyre, Structural Steel Works.
John A. Pearson, Darling & Pearson, Architects.
W. E. Wagner, Engineer and Contractor.
A. F. Wells, Wells & Gray, Contractors.

The memorial, which is discussed editorially in another column, is divided into Parts I. and II.

Part I. contains "an enumeration of the principal grounds of complaint and a consideration of the practical effect of having to conform to the present imperfect code," prefaced by an account of the developments which led up to the formation of the committee and an interesting explanation of the constructive nature of the investigations.

Part II. contains a detailed criticism of the present by-law.

The recommendations are based upon the best engineering practice and not upon comparisons with the building codes of other cities, many of which contain unjust and discriminating clauses.

The objectionable features of the by-law upon which the committee bases its request for revision may be stated briefly as follows:

1. The exacting and unreasonable demands of many of its provisions.
2. Undue laxity in certain other provisions.
3. Incompleteness.
4. Faulty editing.

1. Undue Severity

Exacting and unreasonable demands are met with in many sections of the written by-law. In the interests of brevity only the most important of these will be indicated here, the remainder being cited and discussed in Part II. It should remainder being cited and discussed in Part II. It should be noted in passing that the objectionable requirements enumerated below are those of the written code only, and that the faulty interpretation of the by-law constitutes an additional grievance. The features to which most objection is raised on the ground of undue severity are as follows:

(a) Ten inches of fireproofing (nine inches of brick work and one inch of Portland cement grout) all around external iron and steel columns, and the compulsory use of fireproofing for iron and steel columns in timber construction buildings.

(b) The requirement of curtain walls fourteen inches or more in thickness for all materials, parapet walls fourteen inches thick, and the fixing of the thickness of basement bearing walls, however lightly loaded, at not less than fourteen inches.

(c) Ridiculously low allowable bearing pressures on brick work, necessitating 50 per cent. excess material in piers, pilasters or walls in which the compressive resistance of the brick work is the determining factor of the design.

(d) Unduly exacting rules respecting the number of piles in certain pile foundations.

(e) An allowable bending stress on encased grillage beams much less than is commonly adopted; excessive thickness of the encasing concrete, and the requirement of unnecessary asphalt and plaster coatings.

(f) Impossible assumptions as to the amount of live load on columns, involving in the case of tall office buildings a load in some instances as much as 50 per cent. greater than the maximum probable load.

(g) Lower allowable stresses and severer assumptions of design for plate girders than are customary in good practice; low permissible stresses on shop rivets; the requirement of excessive material for steel columns in the lower storeys of buildings.

(h) Exceptionally low allowable stresses on timber columns.

(i) Specifications of impossible floor loads in a number of classes of buildings.

(j) The provision that the horizontal wind pressure on sloping roofs shall be considered as acting with the full specified intensity of 30 pounds per square foot on the sloping area of the roof.

(k) Excessively low allowable stresses on plain and reinforced concrete; untenable assumptions respecting the design of reinforced concrete structures, the impossible requirement that the deflection of a slab loaded beyond the elastic limit shall be proportional to the load.

2. Undue Laxity

This committee wishes it to be clearly understood that the primary object of its labors was not to cheapen building construction in Toronto, but to secure the enactment of a reasonable, safe and workable by-law. Consequently, wherever certain provisions were, in the opinion of the committee, such as to permit questionable construction, more stringent requirements have been recommended. The more important instances of undue laxity in the written by-law are as follows:

(a) The allowing of the use of inferior grades of Portland cement.

(b) The limitation of the use of fireproof shutters, wired glass or outside sprinklers to warehouses and factories over two storeys in height.

(c) The permission of non-fireproof public schools up to 55 feet in height.

(d) The allowing of woodwork within two feet of cupolas of foundries, and the requirement of only four inches of brick work on a 3/16 inch sheet of metal under boilers or furnaces resting on wooden floors.

(e) Insufficient strength in steel columns in the upper storeys of buildings.

(f) Higher allowable stresses on wind bracing than are usually permitted.

(g) Insufficient protection against corrosion of steel towers supporting water tanks.

(h) The omission of special stair protection in factories, warehouses and retail stores equipped with automatic sprinkler systems.

(i) The fixing of the required strength of concrete blocks at too low a limit.

(j) Inadequate provision for the fire protection of lumber and wood yards in congested districts; insufficient restrictions respecting the storage of hay, straw, ashes and highly corrosive acids.

(k) The permission of wood framing construction for buildings of any size in Fire Limit D (south of the Esplanade).

3. Incompleteness

A critical examination of the present by-law discloses the fact that little or no reference is made to a number of new materials and forms of construction which are now taking an important place in building operations. It is true that some of these are used by special permission of the City Architect, but for the sake of convenience and definiteness the conditions under which their employment is permitted should be inserted in the written code at the earliest possible opportunity. Again, important considerations materially affecting the designs are in many instances not mentioned. While under ordinary conditions this would not prove a serious matter, so frequently has the City Architect's Department placed interpretations on the present by-law entirely at variance with generally accepted engineering theory and practice, that it is considered desirable to have all important assumptions of design clearly stated in the code. In this way the inconvenience and loss of time consequent upon learning the unusual methods of calculation adopted by the City Architect's Department would be avoided.

In the interests of convenience to the public it would also be desirable to have all constructional requirements of the Ontario Factories Act and the Ontario Shops Regulation Act covered in the by-law.

The following are some of the important matters which receive no consideration in the by-law:

(a) Provision for the use of reinforced concrete footings, piles, lintels, pads, retaining walls and chimneys.

(b) The use of cement stucco veneer, as well as brick veneer for frame buildings.

(c) The use of metal lath and cement plaster for the enclosing walls of light and elevator shafts.

(d) The use of hollow concrete walls.

(e) Specifications of the requirements of terra cotta or hollow tile, with respect to strength and absorption and permission for its use as an independent material in residences and similar buildings.

(f) The use of radial firebrick chimneys.

(g) Provisions for light forms of construction commercially practicable for greenhouses.

(h) The number of stairs required for given floor areas.

(i) Necessary dimensions of fire escapes.

(j) The relative transverse and longitudinal bending moments on concrete floor slabs; the distribution of loading along beams carrying slabs reinforced in both directions.

(k) Requirements concerning bridges between buildings.

Some of the subjects which are imperfectly or indefinitely treated in the code are as follows:

(a) The classification of buildings.

(b) The reduction of live loads on columns and [illegible]

(c) Proportioning of column footings to obviate unequal settlement.

(d) Wind pressure on sloping roofs.

(e) Workmanship in reinforced concrete construction.

4. Faulty Editing

Faulty editing of the by-law is responsible for much loss of time and inconvenience to the architect or engineer who is called upon to use it. In a number of instances provisions are located in sections to which they do not belong. For example, the title of sections 27, page 72, is "Wooden columns," while the subjects treated under the section include not only "Wooden Columns," but "Wooden Beams," "Wind Pressure," and "Working Stresses." A further complication in this section results from the treatment of the subject "Eccentric Loads" under the sub-heading "Wooden Beams." Another case of bad arrangement consists in including under the title "Apartment Houses," sections 43, 44, 45, 46 (pages 96 and 97), which refer to asbestos paper between floors, trimming of wooden beams away from flues, metal stirrups, post caps and projections over the street line. Lack of clearness in statement is, of course, a more serious defect than bad arrangement, and of this there are numerous instances. The following examples may be cited in illustration:

(a) The provisions respecting height of ceilings and window areas, while apparently intended to apply only to buildings for human habitation, are not so described in the by-law.

(b) The limitation of the offsets of concrete footings to one-half of the depth of the course below might, for all that is said to the contrary in the by-law, be made to apply to reinforced concrete footings.

(c) While the limitation of the maximum height of piers to seven times their least lateral dimension is obviously based upon the use of brick this fact is not stated.

(d) The formula for the strength of wooden beams purports to give the "ultimate strength," while in reality this is only the "safe strength.

Since the ease with which a building code can be used depends to a considerable extent on the comprehensiveness and good arrangement of the index, it is particularly desirable that improvement be made in the by-law in this respect. Many complaints have been expressed to members of the committee concerning the unsatisfactory indexing of the present ordinance.

The practical outcome of the imperfections of the present by-law and of the erroneous rulings which its indefinite and incomplete character permits, must be apparent to all. If the investor or owner is forced to submit to unreasonable demands in the construction of buildings, the cost of building is thereby increased and the amount and character of it cannot but be affected. It follows further that this excess of cost must finally be paid by those who patronize the owner. The results may be stated concisely as follows:

1. High cost of building, especially in fireproof construction.
2. Location of industries elsewhere than in Toronto because of unreasonable requirements of the by-law.
3. Limitation or restriction of building projects.
4. The encouragement of non-fireproof construction.
5. Inconvenience and loss of time to those engaged in building operations.

1. High Cost of Building

The high cost of building in Toronto, particularly in fireproof construction, is a matter of common knowledge and comment among architects and engineers throughout the country. This can not be attributed to especially high prices for material and labor, for the situation in this respect compares favorably with that existing in neighboring large cities. The resultiag high cost must therefore be largely assigned to the unduly exacting requirements of the Building By-law.

As has already been indicated, the burden unfortunately falls heaviest upon fireproof construction. The erection of steel and reinforced concrete structures is thus virtually discouraged to the extent that the demands of the by-law may be imposed.

In steel construction the amount of additional material necessitated in order to conform to the present by-law after the requirements of sound engineering practice are satisfied, is sufficient to increase the cost of the skeleton, that is, the steel work, floor slabs or arches, roofs, foundations and fireproofing by from [illegible] to [illegible] per cent. For example, [illegible] Theatre, Toronto, was designed almost as a duplicate of one in Buffalo, but before the plans got past the Toronto City Architect the weight of steel required was increased by 30.7 per cent and its cost by approximately the same amount.

The total cost of a steel construction building is, of course, not increased to this extent, since the cost of the skeleton as defined above will only represent from 40 to 60 per cent. of the total cost. In the case of the Bell Telephone Company's building recently completed on Adelaide street west, the total cost of the building was, according to the opinion of the company's architect, at least 10 per cent. more than it should have been had the whole been designed in accordance with good current engineering and architectural practice.

The unusual severity of the Toronto by-law is most strikingly exhibited in its effect on the cost of reinforced concrete construction. It is now generally admitted that this form of construction possesses marked advantages for employment in fireproof buildings, but nevertheless very few buildings of this type have been, or are being, erected in Toronto. The reason is not that natural local conditions are unfavorable, but that the exactions of an unreasonable by-law make its use commercially impracticable. Some actual instances may be of interest.

The Glidden Varnish Company, of Cleveland, contemplated the erection of a five-storey reinforced concrete grinding building here last summer. This structure had been designed by the Osborn Engineering Company, of Cleveland, in accordance with the building code of that city, but the changes in the design necessitated by the Toronto Building By-law so increased the cost of the building that the plans were abandoned an a number of smaller buildings substituted. It was found in this case that the difference in requirements of the building codes of Toronto and Cleveland was responsible for an increase in cost of 15 per cent.

The Union Stock Yards Company wished to use reinforced concrete construction throughout in the 300,000 square feet of buildings which were erected last summer at West Toronto; but after looking into the matter it was found that wood construction would have to be adopted for the roofs, owing to the excessive cost of concrete construction in Toronto. It was found in this connection that the cost of reinforced concrete roofs was at least thirty per cent. greater in Toronto than where the owner would be permitted to take advantage of recent economical developments in constructional practice.

Last summer one of the members of this committee proposed the construction of a reinforced concrete floor for a new school building in this city, basing his design upon the best Canadian and American engineering practice, but adopting the live loads specified in the Toronto by-law. A test was devised and carried out which demonstrated a capacity of 37 per cent. in excess of the test requirements of the by-law, but the City Architect refused a permit and required the addition of concrete and steel which under ordinary conditions as to the prices of material and labor increased the cost of the floor 21 per cent. If the excessive requirements of the present by-law respecting floor loads in schools had been taken into account, the extra cost of this floor over one rationally designed would have been substantially more than 21 per cent.

The foregoing examples have been cited merely to illustrate the excessive cost of reinforced concrete construction in a number of specific instances. Many other similar cases are known to the committee, concerning which information might be furnished, but it is scarcely necessary to multiply examples.

In order to procure additional evidence, the committee has made comparative estimates of the cost of a typical reinforced concrete factory or warehouse building designed (1) in accordance with good current practice, as expressed in the "Recommendations Concerning Reinforced Concrete" submitted in Part II. of this memorial, and (2) in accordance with the Toronto Building By-law as interpreted by the City Architect's Department. The assumed floor and roof live loads are the same in each case, viz., 150 pounds per square foot on each floor, and 40 pounds per square foot on the roof. As a result it was found that the amount of concrete required in the skeleton in order to pass the City Architect's Department was 12½ per cent. more and the amount of reinforcement steel was 56½ per cent. more than the amount required to satisfy the demands of good conservative engineering practice. The cost of the skeleton of such a building was ascertained to be, on the basis of current prices, 20 per cent. more than it should be. Assuming that the cost of the skeleton constituted, say, 55 per cent. of the total cost of the building, and making allowance for the usual percentage of excess cost of curtain walls, parapet walls, etc., a complete reinforced concrete building of this type would then cost about 13 per cent. more than a building meeting with the entire approval of this committee, or any architect or engineer experienced in reinforced concrete construction. The opinion of this committee, based upon the foregoing facts and upon experience in constructing and estimating the costs of reinforced concrete buildings, is that such structures cost complete in Toronto from 10 to 20 per cent. more than they should were a reasonable and at the same time safe by-law in force, and all-concrete constructions, such as floors, cost from 20 to 30 per cent. more than they should.

Due principally to the especially heavy live load for floors specified in the by-law or fixed by the City Architect, and to the low allowable stresses on timber columns, the cost of mill construction is also found by this committee to be about 10 per cent. greater than it should be.

With these facts in mind, it is evident that the cost of building construction, especially of fireproof buildings, in Toronto, is materially greater than it should be after satisfying all the requirements of sound architectural and engineering practice. On steel construction and mill construction buildings the waste has been shown to be about 10 per cent., and on reinforced concrete buildings from 10 to 20 per cent. In addition the severe requirements respecting floor loads, pressures on brick work, compulsory fireproofing of columns in non-fireproof buildings, are reflected in the cost of buildings of ordinary construction. It is true, on the other hand, that in residences and in some buildings of a similar class there is but little waste involved. Taking this fully into consideration, however, the total cost of building in Toronto in any period is, in the opinion of this committee, at least five per cent. greater than it should be, or with an annual building programme of $21,000,000 there is a yearly waste of over a million dollars.

2. Location of Industries Outside of Toronto

It is to be expected that when building construction, especially of permanent or fireproof character, is unduly expensive in Toronto, investors will from time to time pass by this city in selecting a location for their plants and buildings. An example of this is afforded in the following incident:

Some years ago, just after the present by-law was enacted, a Toronto architect received enquiries from a Pittsburg client asking for a copy of the City Building By-law, and stating that he thought of establishing here a branch of a large manufacturing concern which would involve an expenditure of about half a million dollars in building and plant. The only outcome of this was thanks for the by-laws and the statement that they made building much too expensive and practically prohibted the particular kind of building required for his business.

3. Limitation of Building Projects

The curtailment of building projects must of necessity often follow the attempt to enforce an unjust and irrational building code. A typical example of this is as follows:

In the spring of 1910 the National Carbon Company of Cleveland contemplated the erection of a three-storey reinforced concrete warehouse 63 ft. x 102 ft., making it a stand-fireproof building according to the clasifications of the underwriters, or a building of the first-class according to the City of Toronto BuildingBy-law. Their architect visited Toronto and after investigating the local conditions, submitted plans for tender on his interpretation of the Toronto by-law. When tenders were received it was found that the cost ran so far in excess of expectations that their original plans had to be abandoned, and it was decided to erect a one-storey building in reinforced concrete instead of the proposed three-storey building. The company was prepared to spend from $28,000 to $30,000 for the building originally contemplated, but owing to the cost, based on actual tenders, totalling over $40,000, or nearly 50 per cent. more than the preliminary estimates, a building was finally erected costing in the neighborhood of $20,000.

4. Encouragement of Non-Fireproof Construction

Probably the most deplorable result of the present objectionable by-law is the premium which, in effect, it places on non-fireproof construction. Whatever may be said of the probable resistance of mill or slow-burning construction buildings to destruction by fire, it must be apparent that the employment of structural or load-bearing members of combustible materials is always attended with more risk than the use of incombustible materials. No better corroboration of this is needed than in the relative insurance rates of fireproof and mill construction buildings. According to a statement furnished the committee by the Canadian Fire Underwriters' Association, the rates on the latter type of buildings run from 40 to 75 per cent. higher than on the former. It is especially unfortunate that the use of fireproof construction in schools is attended with so much expense, since the peculiar requirements of school buildings lend themselves remarkably well to certain types of fireproof construction, and where the building code admits of the application of modern constructional ideas, fireproof school buildings can be built at very little additional cost over those of timber construction. Under average conditions fireproof buildings in general should be built for from 10 to 15 per cent. more than for mill construction buildings, but from data in the possession of this committee it is evident that the difference in cost in Toronto is from 20 to 30%. If there were only the normal differences in cost of 10 to 15 per cent., owners would frequently pay the difference and obtain fireproof buildings, but rather than pay 20 to 30 per cent. more, most owners prefer to erect a non-fireproof building and pay higher insurance rates, or go to the expense of equipping the non-fireproof building and pay higher insurance rates, or go to the expense of equipping the non-fireproof building with automatic sprinkler systems throughout.

5. Inconvenience to Architects, Engineers and Others

The inconvenience and loss of time occasioned by the necessity of conforming to an incomplete, indefinite and badly-edited by-law is an important consideration. Many instances are known to the committee where plans prepared strictly in accordance with the text of the by-law have been rejected because they did not satisfy some erroneous assumptions of the City Architect's Department. The designer, who perhaps may reside in another city, cannot be expected to know of the personal views of any members of the City Architect's Department, and he must of necessity base his calculations on the written code. Since this instrument is not followed by the Department, it is absurd to issue it for the guidance of designers, for it necessarily follows that plans prepared in strict accordance with it will not be accepted, and must be re-made, perhaps several times, to meet with the final approval of the City Architect.

To conclude, the net results of the objectionable building by-lay which we now have in Toronto are, that the investors of this city waste a million dollars annually, not considering the loss due to vexatious delays in dealing with the City Architect's Department; investors seeking locations for their buildings and plants have more than once passed by this city; extensive building projects have had to be seriously curtailed; and, most serious of all, non-fireproof construction is being effectively encouraged.

For these reasons this committee requests that immediate steps be taken by the City Council to secure the thorough revision of the present ordinance and the enactment of a reasonable, safe and workable by-law.

Respectfully submitted,

Chairman, C. M. Canniff. Secretary, C. R. Young.

Committee.

Gustave Kahn.
C. D. Lennox.
R. L. McIntyre.
T. Harry Mace.
Edwin Menges.
J. P. Murray.
C. W. Noble.
J. Morrow Oxley.
John A. Pearson.
W. C. Phillips.
Thomas Roden.
L. J. Street.
W. E. Wagner.
A. F. Wells.
Murray A. White.
C. R. Young.
John Aldridge.
C. H. Acton Bond.
Geo. Brigden.
C. M. Canniff.
A. W. Connor.
Arthur Dinnis.
W. F. Evans.
J. Galbraith.
P. Gillespie.
H. B. Gordon.
A. H. Gregg.
A. H. Harkness.
Robt. F. Havlik.
J. C. B. Horwood.
W. Ford Howland.

Part II.—Detailed Criticism of the Present By Law

DEFINITION OF TERMS

Cements

Section 14, sub-section 26, page 13.—The cement specification given in the by-law does not conform to that followed in standard practice, being somewhat low in its requirements respecting strength. It would thus permit inferior grades of cement to be used. This committee would recommend that the Standard Specification for Cement of the Canadian Society of Civil Engineers be followed in the by law.

Fireproof Construction

Section 14, sub-section 43, page 19.—In the definition of fireproof construction, the provision that for buildings exceeding one hundred feet in height, all outside window frames and sash shall be of metal or wood covered with metal, should be amended by eliminating "or wood covered with metal," and by providing that these frames and sash are to be required on exposed sides of buildings only, and further that the windows shall be glazed with wire glass, or protected with fireproof shutters or water curtains, except on the ground floor. In the case of all buildings over one hundred feet, or approximately eight storeys, in height, the committee considers the protection of all exposed openings necessary to provide against the possibility of fire jumping across a street or lane.

Skeleton Construction

Section 14, sub-section 44, page 20.—The provision of the present by-law that in all buildings of skeleton construction the thickness of brick around the exterior columns must not be less than nine inches, is needlessly severe in the light of engineering experience and authoritative testimony of experts who have examined and reported upon buildings subjected to large fires. Thus the special committee of the American Society of Civil Engineers, which made an exhaustive report on the San Francisco fire, found that 4 inches of brick work was quite as satisfactory for fire protection as a greater thickness.

This committee therefore recommends that exterior columns or columns in shop fronts, be fireproofed with either (a) 4 inches of brick work, reinforced with metal fabric or bands spaced not more than three feet apart vertically, with a space of not less than one inch between the columns and the brick work filled with Portland cement grout, or (b) with four inches of reinforced concrete.

The requirement of a minimum thickness of 14 inches for curtain walls, whether of brick or concrete, should not be applied to reinforced concrete. Eight-inch concrete walls reinforced to withstand a uniformly distributed pressure of 30 pounds per square foot on either face of the wall, and properly keyed into the wall columns, would, in the opinion of this committee, be quite as satisfactory as 14-inch brick curtain walls.

It should further be permissible to use any material equivalent to wire glass in fire resisting properties for the spandrel sections from the top of a window in any storey to the bottom of the window in the next storey above, provided this distance does not exceed six feet.

The provision that curtain walls must be increased by 4½ inches in thickness below the uppermost 75 feet of the building and by an additional 4½ inches below the uppermost 135 feet, adds no security to the building and should be removed from the by-law.

REQUIREMENTS AS TO STYLE OF BUILDINGS

Section 16, sub-section 1, page 23.—This sub-section should be rearranged so that (a) no building in ordinary construction is allowed to exceed 50 feet in height, (b) buildings over 50 feet in hegiht and not over 70 feet high to be mill or slow burning construction, and (c) all buildings over 70 feet high to be fireproof construction.

Section 16, sub-section 2, page 23.—This sub-section, providing that all buildings to be used as apartment houses, hotels, schools, etc., shall be of the first class, should be amended by striking out the word "schools." A new sub-section should be framed requiring all schools over two storeys high to be first class (fireproof).

FOUNDATIONS

Section 21, page 32.—The reduction of the specified live loads for the determination of the carrying capacity of footings, piers and columns, is, in the judgment of this committee, smaller than might safely be adopted.

It is recommended that for bulidings of group 1 (office buildings, hotels, hospitals, lodging houses, etc.) of the classification proposed above, the full live load on the roof be assumed in figuring the columns supporting the roof, and that the live load on a column between any two floors be the sum of the gross live loads transmitted to that column from all the floors above (and from the roof as well), less a percentage equal to ten times the number of the floors above the column section under consideration until a maximum reduction of 50 per cent. of the gross live load is reached, after which a constant reduction of 50 per cent. shall be used for all column sections below and for the footings as well.

For buildings of group 2 (factories, warehouses, etc.) and 3 (departmental stores) the provision for reduction of live loads should be similar to that for group 1, except that on account of the more constant character of the live load in these buildings, the reduction should be 5 per cent. per floor, and the minimum live load should be 65 per cent. of all the gross live loads above.

It is of importance to note that the clause in the present by-law respecting reduction of live loads on columns, and which was copied from the New York Building Code, is not interpreted by the City Architect's Department as the framers of the original clause intended it should be. The correct method of obtaining the live load on any column section in accordance with the spirit of the provision is to reduce the sum of the gross floor and roof loads above by a percentage equal to five times the number of the floors above the column under consideration, beginning at the second floor below the roof. For the columns supporting the roof and the first floor below the roof no reduction is made. The Toronto City Architect's Department has, on the other hand, required that the live load on any column section below the first two sections from the roof shall be made up of the full load on the roof and the full load on the first floor below the roof, plus the remaining floor live loads down to the section under consideration individually reduced by 5, 10, 15, etc., per cent., beginning with the second floor below the roof. By this erroneous ruling the live load which must be figured on a column section in a typical building is figured much higher than could ever be realized. Thus in an office building with a roof live load of, say, 40 pounds per square foot, and a floor live load of 75 pounds per square foot, the total gross live load on the area tributary to one column would be for the column section between the 11th and 12th floors from the top, 865 pounds per square foot. According to the ruling of the City Architect this would be reduced for the column section mentioned to 660 pounds per square foot, whereas the correct load according to the written code would be 50 per cent. of 865, or 433 pounds per square foot. Similar but less serious results would be obtained for the upper tiers of columns. The interpretation placed upon the by-law by the City Architect, thus, in the case cited, requires 49 per cent. more live load to be counted for this particular column section than was contemplated by the authors of this clause. Quite apart from the original intention of the specification, it is obvious that for an office building the requirement that the column section between the 11th and the 12th floors from the top should be figured for 76 per cent. of the sum of the maximum live loads that could ever arise on the various individual floor at any time, is absurd, and involves a great waste of material.

In addition to a revision of the paragraph respecting the determination of the maximum probable loads on footings, piers and columns, some definite provision should be made for the proportioning of footings to obviate unequal settlement. The areas of the various footings should be fixed so that they are to each other as the sum of the dead loads plus such a percentage of the live load as is likely to occur from day to day under average conditions.

Piling

Section 21, sub-section 3, page 33.—The clause should be amended to allow the use of the proper number in the particular work, on the basis of the load to be carried and the safe bearing power of piles, provided the tops are encased in concrete or spanned by distributing beams properly designed to carry the load of the wall to the piles.

Since the use of concrete piles is now becoming common, definite permission should be given in the code for the use of such types as may be approved by the Inspector of Buildings. As the piles might sometimes be moulded in place, special provision for the determination of their bearing power should be made in the code.

Steel Grillages

Section 21, sub-section 7, page 34.—This sub-section is wrongly entitled "Reinforced Concrete Foundations," since it refers altogether to steel grillages encased in concrete. In addition to changing the title it should also be amended as follows: (a) The thickness of the concrete bed below the rails or beams should be proportioned to the spacing of the latter, but in no case should it be less than four inches and the minimum thickness of the concrete casing above them and on the sides and ends should be four inches. It is evident that the requirement of eight inches in the present code is excessive, since two inches covering in reinforced concrete is considered sufficient. (b) The requirement of asphalt coats on the concrete footing course, or a paint of cement grout or red lead on the beams, is detrimental and should be omitted. (e) An external plaster coat of cement mortar is not necessary if a proper mixture be adopted for the concrete of the footing. (d) The permissible working stress of 16,000 lbs. per square inch in bending on steel beams of grillages encased in concrete, is needlessly low, as good practice permits a stress of 18,000 to 20,000 lbs. per square inch. (e) The 1:2:5 mixture for the concrete of footings is not satisfactory, since enough mortar is not provided to completely fill the voids in the aggregate. Approximately a 1:3:5: mixture should be used for grillages and 1:2:4 for reinforced concrete footings. (f) The requirement that the offsets of concrete footings shall be not more than one-half the depth of the course below, should be limited to plain concrete footings.

Allowable Pressures on Brick Work and Masonry

Section 21, sub-section 13, page 37.—In the table given in the present by-law for the safe loads per square foot on brick work and masonry, the allowable pressures on all classes of brick work are very much lower than the values used in common practice and in the building codes of other large cities. Mr. Peter Gillespie, of the University of Toronto, in an article in the Contract Record for December 7th, 1910, discusses at some length the strength of brick masonry in the light of a large number of recent tests in Canada and in the United States. He shows that from tests made in the University of Toronto on Canadian products, the average crushing strength of ordinary brick masonry laid in lime mortar is 67 tons per square foot, and when laid in cement mortar, 122 tons per square foot. In view of these results it is interesting to note the following safe loads per square foot specified in the Toronto by-law for brick masonry:

Kiln run bricks laid in lime mortar	3 tons
Ordinary bricks laid in Portland cement mortar	5 tons
Hard brick laid in lime mortar	6 tons

It is thus evident that in Toronto the average factor of safety required for brick laid up in lime mortar is 22, and for ordinary brick work with Portland cement mortar no less than 24.

For purposes of comparison Mr. Gillespie quotes from the by-law the following permissible loads per square foot on different kinds of soil:

Gravel and coarse sand, well cemented	8 tons
Dry, hard clay	4 tons
Sand, compact and well cemented	4 tons

His conclusion is most significant:

"Apart altogether from the evidence of tests, does it not seem preposterous that a well compacted sand should be capable of sustaining more load per unit area than any kind of brick masonry, however poor, or that a well cemented gravel should have a sustaining power of nearly three times that of the latter?"

From a study of the available records of tests of brick masonry, the committee is convinced that the permissible stresses on brick work might with perfect safety be increased 50 per cent.

The mixture of concrete specified in the table of safe bearing pressures on page 38 of the by-law being objectionable, as already pointed out, because of insufficient mortar to completely fill the voids of the aggregate, safe bearing values are given for two better-proportioned mixtures.

For foundation walls it should be permissible to use a 1:3:6 mixture of concrete, for which the safe bearing presure should not be greater than 18 tons per square foot.

The list of safe bearing pressures per square foot on brick work and concrete recommended by the committee is therefore as follows:

	Safe load per Square foot.
Kiln run bricks laid in lime mortar	4½ tons
Ordinary brick laid in Portland cement mortar..	7½ tons
Hard brick laid in lime mortar..................	9 tons
Hard brick laid in Portland cement and lime mortar	13½ tons
Hard brick laid in Portland cement mortar......	18 tons
Pressed brick laid in lime mortar	12 tons
Pressed brick laid in Portland cement mortar ...	21 tons
Concrete, one part cement, three parts sand, six parts stone	18 tons
Concrete, one part cement, three parts sand, five parts stone	20 tons
Concrete, one part cement, two parts sand, four parts stone	30 tons

In case of fine water-washed sand being used exclusively in concrete, the safe loads per square foot shall be 20 per cent. less than those given in the above table. If the concrete contains equal parts of water-washed and pit sand, the values given in the table may be used; or if it is desired to use water-washed sand only, and adhere to the values given in the table, this may be done by substituting a

1:2½:4 mixture for the 1:3:5 mixture and 1:1½:3 for the 1:2:4 mixture.

WALLS OF BUILDINGS

Section 22, sub-section 4, page 45.—For pier construction the requirement in all cases of a 14-inch spandrel wall is excessive, and a 9-inch reinforced brick wall laid in cement mortar should be allowed for walls up to a clear span of 12 feet and a clear height of 12 feet. If both dimensions are greater than this, the thickness should then be 14 inches.

Section 22, sub-section 6, page 45.—Internal bearing walls in basements should be allowed to be of 9 inches of brick or 6 inches of reinforced concrete if the stress upon them does not exceed the allowable pressures on brick work and concrete.

In this connection it is of interest to note that while piers alone would be permitted to carry the ends of beams or girders, if a connecting wall is built between the piers it is required to be 14 inches thick.

Section 22, sub-section 7, paragraph (e) page 48.—The requirement of 9 inches of brick work around iron or steel columns introduced in brick walls for carrying trusses or girders is needlessly severe and should be reduced to 4½ inches.

Section 22, sub-section 16, page 51.—The use of cement stucco veneer, as well as brick veneer, should be allowed for frame buildings. The former should consist of a cement plaster coat on metal lath or of reinforced slabs suitably tied to the building.

Section 22, sub-section 18, page 52.—Parapet walls need not be 14 inches thick except where they exceed three feet in height. For lesser heights nine inches is sufficient. All parapet walls should have a suitable coping laid in cement mortar.

Sections 22, sub-section 24, page 54.—The hanging of a fire door on wooden frames covered with metal is objectionable, as the entire frame might drop out during a severe fire, and the use of a cord to hold open such a door in the hope that the fire burning it would enable the door to close, is antiquated and unsafe. Such doors should be hung so as to be secure in ths severest fire; they should overlap the opening four inches on the sides and top; the thresholds should be of concrete or other fireproof material; and the cord should be replaced by a fusible link melting at 155 degrees.

Cast Iron Columns

Section 25, sub-section 3, page 68.—In the interests of simplicity the formulas in the present by-law for the safe loads on cast iron columns should be replaced by a single straight-line formula. The following formula, giving approximately the same working stresess as the present ones, is recommended:

$$p=10{,}000-200\frac{l}{d}$$

where

p=permissible stress in pounds per square inch.
l=unsupported length in inches.
d=least lateral dimension (diameter or side) in inches.

STEEL AND WROUGHT IRON

Riveted Plate Girders

Section 26, sub-section 1, page 70.—The requirements with respect to the net flange area of plate girders are much more severe than hold in standard practice. The permissible flange stress on steel should be increased from 14,000 to 16,000 pounds per square inch, and one-eighth of the gross area of the web should be allowed as flange area.

The permissible shearing stress on the webs of plate girders should be increased from 9,000 to 10,000 pounds per square inch, to conform more closely to common engineering practice.

Rivet Stresses

Section 26, sub-section 2, page 70.—This sub-section should be arranged more clearly. The permissible shearing stress on steel shop rivets should be increased from 9,000 to 10,000 pounds per square inch, and the permissible bearing stress on steel shop rivets from 18,000 to 20,000 pounds per square inch. The permissible bearing stress on steel field rivets should be reduced from 18,000 to [illegible] pounds per square inch.

Columns

Section 26, subsections 3 and 4, page 71.—While the use of wrought iron in the form of columns is comparatively unimportant and is now limited to wrought iron tubes or pipes, the committee recommend that [illegible] be retained in the by-law. The present formulas should be replaced by a single straight-line formula smiliar to that proposed below for steel columns and based on the lower compressive resistance of wrought iron.

Section 26, sub-sections 5 and 6, page 71.—The formula for the design of steel columns specified in the by-law is based upon a small group of column tests made years ago and does not conform very closely with the entire range of tests now available nor with the improved knowledge of steel columns resulting from recent investigation. It is now very generally held that the working strength of a steel column should be based, not upon the ultimate strength, as was formerly the case, but upon the elastic limit, since loading a permanently deformed column would be attended by considerable danger. The usually accepted factor of safety on the elastic limit is two. Consequently the suitability of the present formula can only be investigated by observing its conformity with the recorded elastic limits of full-sized columns under test. For this purpose Fig. 1 has been prepared, in which are shown the plotted values of the elastic limits divided by two for all tests known to the committee, an adjustment being made in the figures for the wrought iron and nickel steel columns to express the probable safe strength of medium structural steel columns of the same dimensions. From the figure it is evident that columns having a low value of l/r are at present required to be unnecessarily strong, while relatively slender columns are allowed to be much too light for the computed loads. This committee therefor recommends that for steel columns and struts where l/r does not exceed 125 the following formula be adopted:

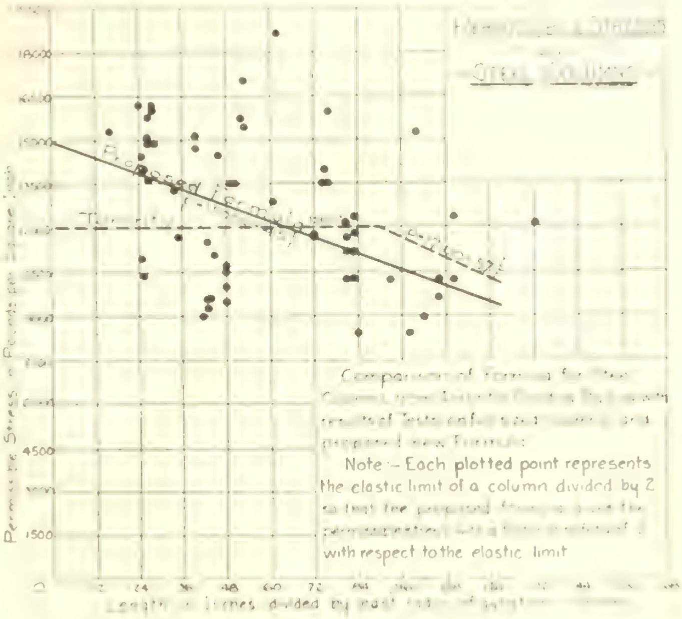


Fig. 1

$$p=15000-45\frac{l}{r}$$

where p=safe compressive stress in pounds per square inch.
l=unsupported length in inches.
r=least radius of gyration in inches.

WOOD

The allowable stresses on wood prescribed in the by-law in a number of instances do not conform very closely to the results of tests, and should therefore be changed. Sumplification of the column and beam formulas is also desirable

Wooden Columns

Section 27, sub-section 1-3, page 72.—From an extensive series of tests reported by the Watertown Arsenal, the following formulas have been developed:

$$p=[illegible]\frac{l}{d}$$ for oak and long leaf pine

$$p=[illegible]\frac{l}{d}$$ for white pine, red pine, spruce and hemlock.

These are based on a [illegible] and give for [illegible] stresses considerably higher than those which the present code recommends. In addition, it is believed that a straight line formula will fit the tests already available quite as well as the more complicated ones in the present by-law. A graph showing the tests consulted is shown in Fig. 2. No distinction is necessary between square and round columns and the formulas are therefore the same for both.

It is recommended that the maximum value of l/d be 30.

Wooden Beams

Section 27, sub-section 4, page 73.—The form of the expression given in this sub-section for the safe carrying capacity of wooden beams is objectionable, in that it is particular and applies only to beams for which the entire load is uniformly distributed. The statement that the formula is for "ultimate loads" is incorrect. From the coefficients listed it is evident that the formula is for "maximum safe loads."

The use of the special coefficients "C" and the definition of "L" as the span in feet while on the preceding page "L" signifies the length of a post in inches, is liable to create confusion. Errors in the use of a formula would therefore be much less likely if it were of the following form:

$$bd^2 = \frac{6\,M}{f}$$

in which b=breadth of beam in inches.
d=depth of beam in inches.
M=bending moment in inch-pounds.
f=permissible fibre stress in pounds per square inch.

WIND PRESSURE

The provision that all structures shall be designed to resist a horizontal wind pressure of 30 pounds per square foot of exposed area, including the roof in any direction, should be modified by altering the last few words to "Including the vertical projection of the roof." The ruling of the City Architect that the horizontal wind pressure on a sloping roof shall be considered as 30 pounds per square foot on the area of the roof as measured up the slope, is absurd. A horizontal wind pressure of 30 pounds per square foot could not possibly produce a pressure of 30 pounds per square foot on any inclined surface.

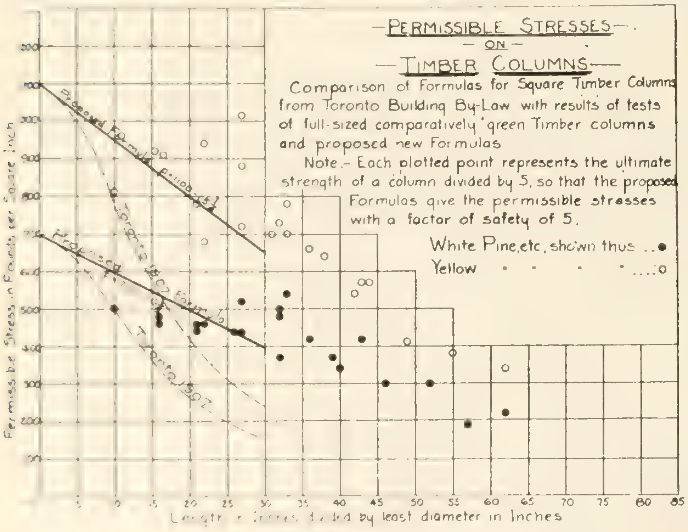


Fig. 2

It is recommended that for sloping roofs the wind pressure be considered as acting normal to the roof with an intensity in pounds per square foot of sloping surface of

$$p = \frac{2}{3}\,i$$

where "i" is the angle of inclination of the roof to the horizontal in degrees. In no case shall "p" exceed 30 pounds per square foot.

Provision should also be made in the by-law for the computation of the wind pressure on cylindrical surfaces, such as water tanks or chimneys. It is recommended that the pressure on such surfaces be taken as 30 pounds per square foot, acting on an area equal to $\frac{2}{3}\,dh$ where d= the diameter and h = the height in feet.

WORKING STRESSES

Section 27, sub-section 11, page 75.—This list of working stresses should be made complete by covering all materials specified in, or recognized by, the by-law. The working stresses on masonry, brick work, concrete and reinforcement for concrete, should therefore for ease of reference be stated in this section, as well as elsewhere.

The following changes in permissible stresses now specified in the by-law are recommended, based upon a close examination of recent tests of the materials concerned. Rolled steel should in each case be specified as medium steel.

Compression (Direct)

The bearing pressure on shop rivets and pins should be increased from 18,000 to 20,000 pounds per square inch, and that on field rivets should be specified as 15,000 pounds per square inch.

Shear

The allowable shearing stresses on steel web plates and rivets should be altered as already specified under section 26. The shear on ordinary steel field bolts should be reduced from 7,000 to 5,000 pounds per square inch, and for steel turned bolts with drilled or reamed holes it may be made the same as for field rivets, viz., 7,500 pounds per square inch. Reference to wrought iron web plates, shop rivets, pins and field bolts should be omitted, as these are no longer used.

Extreme Fibre Stresses (Bending)

Rolled steel pins are commonly designed for a bending stress of 25,000 pounds per square inch, and this figure is recommended instead of 18,000 pounds per square inch of the present by-law.

FLOOR AND ROOF LOADS

Section 29, page 79.—The specified live loads on floors are in a number of cases much greater than are at all likely to occur in practice, and in the interests of economical construction some reduction in such loadings should be made. As has already been pointed out, this section should be made to include the provisions respecting wind pressure, amending the title to conform to the change.

Sub-section 1, paragraph (b), page 79.—The probability of the main entrance halls of hotels, apartment houses, tenements or other buildings used as dwellings being loaded to the extent of seventy-five pounds per square foot, is exceedingly small, and for this reason it is recommended that this specified live load be reduced to the same amount as fixed for the private rooms or apartments, viz., fifty pounds per square foot.

Sub-section 1, paragraph (d), page 79.—It has been clearly shown by many careful investigations that with the exception of the ground floor, the floors of office buildings are not subjected to any greater loading than those of an average residence. For this reason the requirement of the present by-law that the office floors shall be calculated for a live load of seventy-five pounds, the halls and lobbies for one hundred pounds, and the ground floor for one hundred and twenty-five pounds, is, in the opinion of the committee, much to severe. It is strongly recommended that these requirements be reduced to fifty pounds without partitions and 75 pounds including partitions on all floors except the ground floor, where it should be one hundred pounds per square foot, no distinction being made between the loading in the corridors and in the offices.

Sub-section 1, paragraph (e), page 80.—For churches, theatres and public buildings with fixed seats a live load of one hundred (100) pounds per square foot is impossible, and this committee recommends that for such buildings the specified load be reduced to fifty (50) pounds on the floor and aisles and seventy-five (75) pounds per square foot in the corridors and lobbies.

Sub-section 1, paragraph (f), page 80.—This committee does not regard live loads of eighty-five (85) pounds per square foot in school rooms and one hundred (100) pounds per square foot in the corridors and lobbies of schools as possible loads, and recommends that the loads be fixed at sixty (60 pounds per square foot in class rooms, corridors or lobbies.

A new paragraph (i) should be inserted relating to the loads on garage floors, in view of the fact that impossible live loads, such as 300 and 350 pounds per square foot are fixed by ruling of the City Architect's Department for the floors of such buildings. It is recommended that the loading for the ground floors of garages and stables be two hundred (200) pounds per square foot, and for all upper floors of such buildings it be one hundred and twenty-five (125) pounds per square foot.

WATER TANKS

Section 32, page 83.—The specification concerning the supports of water tanks should be amended to permit the use of concrete bearing walls or reinforced concrete beams of columns. It should further be stipulated that metal tank supports should be protected from rust by encasing in concrete or by the use of other protecting material.

STAIRS

Sub-section 1, page 84.—This sub-section states that hotels, tenements, lodging or rooming houses having twenty-five or more rooms shall have at least two independent stairways, etc., but it does not state for what number of rooms or for what floor area, three, four or more, stairways will be required.

Sub-section 2, page 85.—The committee would suggest that the size and number of stairs in factories, work rooms, etc., be directly proportionate to the floor area, which is fixed, instead of to the number of people to be employed in the building, which is a variable and a highly indefinite quantity.

Regulating the number and size of stairways to the number of people occupying a building seems practicable in theatres, assembly halls, churches, ets., where there are fixed seats.

Sub-section 2 should, in the opinion of this committee, be amended and enlarged as follows, beginning with the sixth line from the bottom of page 85:

"In all cases the staircases are to be located at the most advantageous points to serve as exits for the whole floor, and where two or more staircases open on a floor they shall be at as great a distance from each other as practicable.

"The staircases as described above shall be enclosed with fireproof partitions of one of the types specified in the recommendations of this memorial concerning section 22, sub-section 41, page 59, of the by-law. Staircases are to be entered at each floor through fireproof doors designed to swing outward. Each staircase is to have a hinged window at each floor opening, so as not to obstruct the passage of the stairs."

FIREPROOFING IRON OR STEEL COLUMNS

Section 37, paragraph 1, page 87.—The encasement of iron or steel columns under breastsummers supporting any portion of the external or party walls of buildings over two storeys in height should be more definitely specified. Instead of "four inches of brick work or other incombustible material," it is recommended that this be "four inches of brick work, tile or concrete, reinforced with mesh fabric or a double casing of metal lath and cement plaster, with an air space between.

It is also recommended that columns without fireproofing in street show windows be limited to buildings less than 4 storeys in height.

Section 37, paragraph2, page 87.—Since the fireproofinf of iron or steel columns in the internal portion of non-fireproof buildings could not of itself retard the complete destruction of the building by fier, this paragraph should, in the opinion of the committee, be omitted, thus leaving the use of such fireproofing optional.

FIREPROOF SHUTTERS

Section 48, page 99.—In the opinion of this committee metal window frames and sash, with standard wire glass, are preferable to fireproof shutters, as the shutters are useless if not closed. The requirement of sub-section 2, that such shutters shall be closed upon completion of the business of the day, is futile, since it is not enforced. Either metal window frames and wire glass, outside sprinklers, or fireproof shutters, should be provided on all buildings (ex cept private dwelling houses and churches) on every exterior window opening above the first storey, except front openings of buildings fronting on streets which are more than 100 feet wide, or where no other buildings are within 100 feet of such openings. The committee does not consider it sufficient to take these measures merely on warehouses or factories over two storeys in height, and only on these buildings where the openings do not face on a street more than 60 feet wide. Where fireproof shutters are used they should be equipped with an automatic closing device.

FIREPROOF FLOOR TESTS

Section 110, sub-section 8, page 138.—It is specified in this sub-section that at the end of the water test the panel shall be loaded to three times the load for which the panel was designed and that under this increased holding the deflection of the beams or girders shall not exceed three times the allowed deflection for the specified live load. This requirement is unreasonable and impossibfe, since the deflection is not proportionate to the load after the elastic limit has been passed, but increases at a more rapid ratio than the load.

REINFORCED CONCRETE CONSTRUCTION

Section 111, page 139.—The committee has not found it desirable to submit a detailed criticism of the existing provisions of the code with respect to this form of construction, inasmuch as a thorough revision is necessary. Its views on the principal points at issue are given below in the form of recommendations. These recommendations are obviously not to be regarded as a complete specification for reinforced concrete.

Objection is made to the provisions of the present by-law respecting reinforced concrete on the following general grounds: (1) the strength and reliability of this form of construction is greatly underestimated, (2) the assumption of design and the principles of calculation adopted are not in conformity with sound and generally recognized engineering theory, and (3) the specification is not sufficiently complete to form an effective set of working rules for the designer and constructor. Further, while the shortcomings of the written code are sufficiently serious in themselves, the erroneous interpretations placed upon it by the City Architect's Department, constitute an additional source of objection.

The lack of confidence in the strength and reliability of reinforced concrete is exhibited in the following, among other particulars: A permissible working stress in bending on concrete of only 500 pounds per square inch; an allowable compressive stress of 350 pounds per square inch on concrete in columns; the requirement of a 14-in. concrete wall in lieu of a 9-in. brick wall; the fixing of the test load for concrete floor panels at three times the load for which it is designed.

Some assumptions of design which do not meet with the approval of the committee are: the neglect of all continuity in beams and girders and the fixing of a maximum bending moment in slabs as not less than 1-10 $w\ l^2$; the assumption of the ratio of the modulus of elasticity of steel to that of concrete as 12 inches in all cases; the figuring of longitudinal steel in columns at 12,000 pounds per square inch; the limiting of the ratio of the length to the least lateral dimension of reinforced concrete columns to 12.

Incompleteness of the present by-law allows loop-holes, in the opinion of the committee, for a number of objectionable interpretations, or rulings, of the City Architect's Department. For example, the statement of the formula for the moment of resistance of a concrete beam economically reinforced; the neglect of flange value in a slab which extends on only one side of the beam; the use of compression reinforcement in beams.

In view of the many imperfections of the portion of the by-law dealing with reinforced concrete construction, and in order to avoid misunderstanding as to what is meant, the views of the committee on the principal points at issue are submitted below in the form of certain recommendations. It should be clearly understood that these recommendations in no sense constitute a complete specification for reinforced concrete.

Recommendations Concerning Reinforced Concrete

(1) There shall be no [illegible] to the height of buildings of reinforced concrete except that arising from the requirements of the by-law.

(2) Fine aggregate shall consist of sand, crushed stone or gravel screenings, passing when dry a screen of quarter-inch mesh. Not more than six per cent. shall pass a sieve having 100 meshes per lineal inch. It shall be of clean material, free from vegetable loam or other deleterious matter.

(3) Coarse aggregate shall consist of inert material, such as crushed stone, or gravel, which is retained on a screen of quarter-inch mesh. The particles shall be clean, hard, durable and free from all deleterious material. The maximum size of the coarse aggregate shall be such that it will not separate from the mortar in laying and will not prevent the concrete fully surrounding the reinforcement or filling the parts of the form. Aggregate containing [illegible] flat or elongated particles shall not be used.

(4) For reinforced concrete constructoion the mixture shall not be leaner than one part of cement to [illegible] parts of fine and coarse aggregate measured separately and proportioned for maximum density, nor shall the crushing strength

be less than two thousand pounds per square inch after hardening for 28 days. Richer mixtures may be used, for which the permissible stresses hereinafter specified may be increased by amounts proportionate to the increased compressive strength.

(5) Reinforcement steel shall confarm to the Manufacturers' Standard Specifications. Either medium or high elastic limit steel may be used, at the discretion of the architect or engineer.

(6) As a basis for calculations for strength of reinforced construction, the following assumptions shall be made:

(a) A plane section before bending remains plane after bending.

(b) The modulus of elasticity of concrete in compression within the usual limits of working stresses is constant.

(c) In calculating the moment of resistance of beams the tensile stresses in the concrete shall be neglected.

(d) Perfect adhesion is assumed between concrete and reinforcement. Under compressive stresses the two materials are therefore stressed in proportion to their moduli of elasticity and their distance from the neutral axis.

(e) The ratio of the modulus of elasticity of steel to the modulus of elasticity of concrete shall be assumed to be 15 for concrete with a crushing strength of 2,000 pounds per square inch at 28 days.

(f) Initial stress in the reinforcement due to contraction or expansion in the concrete may be neglected.

(7) The span length for beams and slabs shall be taken as the distance from centre to centre of supports, but shall not be taken to exceed the clear span, plus the depth of beam or slab. Brackets shall not be considered as reducing the clear span.

(8) Where slabs and beams are figured as simple beams the length shall be considered as the clear distance between supports, excluding brackets.

(9) Length of columns shall be taken as the maximum unsupported length.

The ratio of least diameter to height shall be taken as one-fifteenth.

(10) The bending moment on slabs or beams uniformly loaded and supported at two sides or two ends only shall be taken as $\frac{1}{8} wl^2$ where w is the load per unit of length and l is the span.

(11) For interior spans of slabs, beams and girders, the sum of the maximum positive bending moment at the support shall be taken as $\frac{1}{6} wl^2$ for uniform loading, and for other loading 4/3 of the maximum moment for a simple beam loaded in the same manner. The relation of maximum negative moment to maximum positive moment is to be fixed by the architect or engineer and the distribution of the reinforcement arranged accordingly.

(12) For beams simply supported at one end and continuous at the other, the maximum positive bending moment shall be figured at not less than eight-tenths that of a simple beam.

(13) Floor slabs may be designed and reinforced as continuous over the supports. The distribution of loads longitudinally and transversely in slabs reinforced in both directions shall be determined by the following formula:

$$r = L^4 \div (L^4 + B^4)$$

where r is the ratio of the load carried transversely to the whole load, L is the length and B the breadth of the slab. If the length of the slab exceeds 1.5 times its width, the entire load shall be assumed to be carried by the transverse reinforcement. Square slabs are preferably reinforced in both directions, using one-half the computed reinforcement in each direction.

(14) The loads carried to beams by slabs which are reinforced in two directions will not be uniformly distributed to the supporting beams, but may be assumed to vary as the ordinates to the sides of an isosceles triangle, the base of which is the length of the beam. The moments in the beams shall be calculated accordingly.

(15) In beam and slab construction an effective metallic bond shall be provided at the junction of the beam and slab. When the principal slab reinforcement is parallel to the girder, transverse reinforcement shall be used extending over the girder and well into the slab.

(16) Where adequate bond between the slab and the web of the beam is provided, the slab may be considered as an integral part of the beam, and its effective width shall be determined by the following rules:

(a) It shall not exceed one-fourth of the span length of the beam.

(b) Its overhanging width on either side of the web shall not exceed four times the thickness of the slab nor twice the thickness of the web.

(c) Where the slab extends on only one side of the beam it shall be permissible to consider as effective flange area an overhanging width not greater than four times the thickness of the slab nor twice the thickness of the web.

(17) The working stresses proposed below are for a concrete the ultimate crushing strength of which at an age of 28 days is 2,000 pounds per square inch. For concrete greater or less compressive strength, proportionate increments to, or reductions from the proposed stresses, shall be made.

(a) Bearing compression, 650 pounds per square inch.

(b) Compression in extreme fibre, 650 pounds per square inch, with increase of 15 per cent., near supports in continuous beams.

(c) Axial compression in columns, 500 pounds per square inch and 7,500 pounds per square inch on vertical reinforcement.

(d) Safe shearing stress (combined with diagonal tension) on the concrete in beams, 50 pounds per square inch.

(e) Bond between plain bars and concrete, 60 pounds per square inch of surface of bar; where adequate mechanical bond is provided, a maximum stress of 120 pounds per square inch of surface of bar may be permitted.

(f) The allowable tensile stress in steel reinforcement shall be 16,000 pounds per square inch for steels, with an elastic limit up to 48,000 pounds per square inch; for steels with a higher elastic limit, the permissible stress shall be one-third of the elastic limit; but in no case shall it exceed 20,000 pounds per square inch.

(18) The compressive stress in the steel reinforcement shall be fifteen times the allowed compression in the concrete in which the steel is embedded.

(19) The resisting moment in inch-pounds of a rectangular beam, economically reinforced, shall be taken at $R b.d^2$ where

b=the breadth of the beam in inches.

d=the depth in inches to the centre of the steel.

R=a coefficient varying with the allowable stress in the steel as follows:

Permissible Stress in Steel in Pounds per Square Inch

	R.
16,000	108
17,000	104
18,000	100
19,000	97
20,000	94

(20) Reinforced concrete walls may be used in place of brick or stone exterior or bearing walls with thickness reduced to two-thirds the thickness specified for brick walls. Such walls shall not be less than six (6) inches thick.

(21) Reinforced concrete-bearing walls shall be reinforced at both faces. The maximum spacing of bars in the same vertical plane shall be 18 inches on centres. The quantity of metal employed shall be sufficient to provide for a uniformly distributed horizontal pressure of 30 pounds per square foot acting on either side of the wall.

(22) Whenever floors are built with a combination of tile or other fillers between joists, the following rules regarding the dimensions and methods of calculation shall be observed:

(a) The ratio of minimum depth to clear span of joist shall not be less than one to twenty-four.

(b) Wherever a portion of the slab above the tile joist shall be considered as acting as a Tee-beam section, the slab portion must be cast monolithic with the joist and must have a minimum thickness of at least two inches. In such case all regulations applying to Tee-beams shall apply to tile and joist construction.

(e) In no case shall the tile or other fillers be considered as bearing stress.

(d) Wherever porous tiles or other materials which by their nature will absorb water from the concrete, are used between the joists, care must be taken to thoroughly saturate the tiles or other materials with water immediately before the concrete is placed.

(23) The minimum clear distance of the reinforcing steel from the face of the concrete shall be two inches for the main reinforcement in columns, one and one-half inches for the reinforcement in girders and beams, and one inch for floor slabs.

(24) The lateral spacing of parallel bars shall not be less than three diameters, centre to centre; and the clear spacing

between two layers of bars shall not be less than one inch.

(25) Definite provisions should be made in the by-law to ensure care and accuracy in construction, since upon this the excellence of reinforced concrete work largely depends. A series of clauses based on the best engineering practice of to-day should be inserted covering the following matters in detail:

(a) Proportioning and measurement of ingredients.
(b) Mixing by machine and by hand.
(c) Placing of concrete.
(d) Placing in water and in freezing weather.
(e) Keeping concrete wet.
(f) Joining up new work to old.
(g) Shrinkage.
(h) Splicing of reinforcement.
(i) Location of joints in concrete work.
(j) Character of forms.
(k) Removal of forms.
(l) Installation of conduits of piping .

Canadian Railroad Development

A syndicate has been formed in London for the construction of a railway from the Saguenay River to Cape Charles Bay, on the east coast of Labrador, a point 650 miles from Quebec. Montreal people, including Rodolphe Forget, are interested in the enterprise, which will connect with the Quebec & Saguenay line, which M. J. O'Brien of Ot'awa, will build during the next eighteen months to Murray Bay.

It is understood that governmental legislation authorizing the construction of the Hudson Bay Railway and a supplementary estimate, covering the preliminary cost will be introduced before the end of the present session of Parliament.

Construction work has been started on the first section of the Quebec and Saguenay Railway which is to extend from Ste. Anne de Beaupre to Murray Bay. This work is being undertaken by Messrs. O'Brien & Doheney, the subcontractor for the first stage of the line being Mr. R. Kennedy.

Advices from Lethbridge, Alta., quote A. M. Grace, chief engineer of the South Alberta Land Company, as stating that the survey is completed and stakes driven for a railway line from Kipp, across the river from Lethbridge, to Suffield, on the Canadian Pacific main line, bringing Lethbridge into direct communication with the irrigated tract of land.

D. McNicholl, Montreal, Que., Vice-president Canadian Pacific Railway, has directed the engineering department to begin work at once on the new lake shore line to Toronto. A single track will be laid first, and a double track will be added as soon as business warrants it. At least that is the proposal at present, though there is a possibility that a double track may be built at the outset. In order to expedite the work one party of engineers will work east from Toronto and another west from Glentay.

The difficulties over the construction of the Second Narrows bridge at Vancouver, across Burrard Inlet, have been definitely settled by an agreement that the Burrard Inlet Tunnel & Bridge Company will construct the bridge on the site chosen for the structure by the V. W. &. Y. Railway Company, securing for the purpose the railway subsidy of $200,000 which the Dominion government originally granted to the railway. This sum is to be revoted to the V. W. & Y. and will be turned over by it to the other company. The V. W. & Y. will construct, in turn, the approaches to the bridge as well as connecting lines on the north and south shores .

The Canadian Pacific Railway is to start work shortly on the location of the line from Glentay, 16 miles west of Smith's Falls, to Toronto. The location will extend from Glentay southwest to Belleville, thence along the lake shore to a point east of Leaside Junction. It will then work up to Leaside. The company will have a grade of about four-tenths of one per cent. per mile. The line between Guelph Junction and Hamilton has been located, and the bulk of the right of way bough.t Grading is now progressing on the Victoria Harbor route from a point six or seven miles from Orillia to Bethany. Steel will be laid on the new railway from Victoria Harbor to Bethany, near Peterborough, this year, and before the snow flies it is expected that wheat will be hauled from that harbor.

The Canadian Northern Railway is planning extensive work in British Columbia this season. Contracts will shortly be awarded for the building of the 163-mile stretch of main line from Hope to the crossing of the North Thompson, near Kamloops. The work will be awarded in four sections and in round figures probably represents an expenditure of $15,000,000. It will include the driving of two and three-quarter miles of tunnels along the Fraser river and the north side of Kamloops Lake.

Kennedy & Macdonald, Edmunston, N.B., have started work on their 65-mile contract on the Transcontinental Railway from Grand Falls, N.B., to Baker Lake, N.B. The construction is in charge of Mr. John Kennedy, who hopes to see the work completed on or about December 1st, 1911. The firm is well provided with both labor and equipment. They will employ 300 men this year. Their equipment consists of 5 locomotives; 15 Hart convertible cars, and 90 other cars; Lidgerwood rapid unloader; Jordan spreader; Marion and Bucyrus steam shovels; track-laying machine; and a complete grading outfit.

The Cowan Construction Company, Winnipeg, Man., which has the contract for the first 40 miles of the new Canadian Northwest line towards Peace River, is to start work at once. The new line towards Peace River has been located for a distance of 80 miles northwest of Edmonton. The line leaves the main line at Onoway, about 30 miles west of the city, and runs northwest to Pembina and to the Athabasca River, and crosses at Habaska, 30 miles below the mouth of the McLeod River. It is understood to be the intention of the railway company to push this line forward as fast as possible, and to have at least 40 miles completed this year. The survey of the line is to be carried through next year to Dunvegan on the Peac River, and eventually through Pine Pass to the Pacific coast.

Work has just been commenced on the laying of an electrical transmission line from Shawinigan Falls to Montreal, a distance of about 85 miles, by the Shawinigan Water & Power Company. This line will consist of two 3-phase circuits. A new receiving and distributing station is being erected by the company near their other east-end station at Maisonneauve as the Montreal terminal of this new line. The cable used will carry 100,000 volts, furnishing the equivalent of 25,000 h.p. This voltage will constitute the first instalment of a contract made by the Shawinigan Company to furnish the Montreal Light, Heat & Power Company with 60,000 h.p. of electrical current. The new line between Shawinigan and Montreal will follow closely the line of the C. P. R. between those points and for the greater part of the distance it will be about ten miles from the line built a few years ago which lay close to the Canadian Northern. The construction work will be done [illegible] by the company's own [illegible]. The line will be [illegible] ther on steel towers and it is hoped to have the work completed during the present season. When this line is completed the company will be ready to build another line to [illegible] the balance of the power contracted for with the Montreal Light, Heat & Power Company.

Personal Mention

Herbert B. Rugh, the well known Winnipeg architect, was the successful competitor in the competition arranged by the city of Winnipeg for plans for the proposed infectious diseases hospital to be erected at once on the property secured by the city of Riverview. Tenders for construction, estimated to cost $200,000, will be called immediately.

David Wagstaff, of Toronto, was in Regina recently looking over the prospects for the eastablishment of a brick making plant in that vicinity.

F. S. Keller and J. L. Keller, late of Mamtisque, Michigan, have started in the building and contracting business in Moose Jaw. The Keller brothers are Canadians, their home town being Newmarket, Ont.

Mr. O. L. Dickeson, until recently Inspector of Transportation of the Chicago, Burlington & Quincy R. R., has been elected vice-president of the White Pass & Yukon Route, which includes four small railways in Alaska and British Columbia. He will make his headquarters at Vancouver, B.C.

Wm. Henderson, of New Westminster, has retired from the position of waterworks superintendent of that city. Mr. Henderson, who leaves shortly on a trip to his old home in Ireland, will be succeeded as superintendent by Mr. A. S. Wooton, of Vancouver.

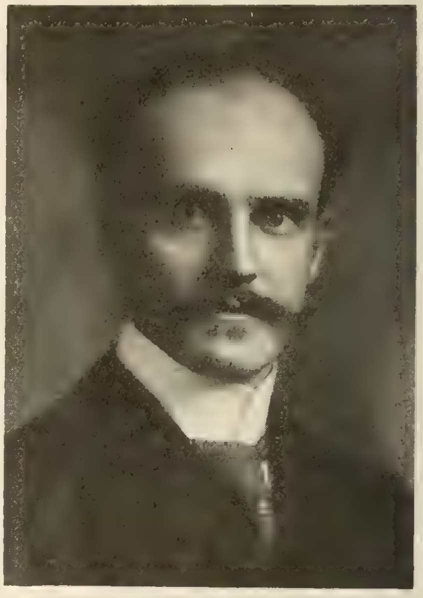
The New Chief Engineer of the Quebec Bridge Commission

Mr. C. N. Monsarrat, who has just been appointed Chief Engineer and Chairman of the Quebec Bridge Commission, was born and educated in Montreal. Having a natural aptitude for constructive and designing work he fitted himself for an important position in the draughting office of the C. P. R. some twenty years ago. He received his technical education along architectural and engineering lines by private tuition, being unable to take the full university course owing to ill health. From 1890 to 1896 he was employed as a draughtsman in the bridge department of the C. P. R., and from 1896 to 1902 as assistant to the engineer in charge of the design and construction of bridges for the C. P. R., In 1903 he was appointed engineer of bridges for the C.P.R., which position he has held until the present time. On account of his new appointment Mr. Monsarrat will be obliged to sever his connection with the C. P. R. That his services have been highly appreciated is indicated by his promotion to the important position which he has filled for the last eight years. Mr. Monsarrat will succeed Mr. Vautelet on the Quebec Bridge Commission. It is a coincidence that Mr. Monsarrat succeeded Mr. Vautelet as Bridge Engineer for the C. P. R.

Mr. C. N. Monsarrat, of Montreal,
who has been appointed Chief Engineer of the Quebec Bridge Commission.

Mr. Beaudry Leman,—Montreal Electrical Commission

Mr. Beaudry Leman, general manager of the Canadian General Development Company, Limited, and one of the engineers recently appointed on the electrical commission of the city of Montreal, was born in Montreal and is the son of the late Dr. J. Leman. He received his early education at the Mount St. Louis College in this city, and received his classical training by private tuition. So as to obtain the best possible technical instruction Mr. Leman went to France, where he studied for four years, graduating at the Ecole des Hautes Etudes Industrielles of the University of Lille as a civil engineer. Returning to Montreal he entered McGill University and at the end of a year graduated as Bachelor of Science. This was in 1900. From 1900 to 1905 Mr. Leman was engaged with the Shawinigan Water & Power Company, superintending the installation of their hydro-electric power plant and the construction of the transmission line from Shawinigan to Montreal. In 1905 Mr. Leman spent part of the summer in New York State, being associated with Mr. Wallace C. Johnson in the installation of the first hydro-electric power plant constructed at Niagara Falls. In the latter part of 1905 and the early part of 1906 Mr. Leman was employed on construction work for the St. Maurice Valley Railway. Subsequently he acted as consulting engineer in connection with several hydro-electric development projects.



Mr. Beaudry Leman.

In 1909 Mr. Leman was appointed by the city of Montreal along with Messrs. Ross and St. George on the first commission to study and report upon the feasibility of constructing a comprehensive conduit system to accommodate all the overhead wires, excepting trolley wires, in the streets of the city. This commission reported to the conduit committee of the city council and acting in conjunction with this committee formulated amendments to the city charter which were adopted by the Provincial Legislature in 1909. This enactment constitutes the basis and authority for the operations of the present electrical commission. The other engineers on the commission are R. S. Kelsch and L. A Herdt, both of Montreal.

Mr. S. H. Chapman, president and general manager of the Ontario Wind Engine and Pump Company, was in Winnipeg recently, accompanied by Mr. G. M. Miller, architect, for the purpose of awarding contracts for the company's large new warehouse at the corner of Logan avenue and Arlington streets.

Mr. W. M. Arnold, city engineer of Lethbridge, Alta., has resigned.

Winnipeg lost one of its pioneer railway contractors last week in the death of Mr. John Hargrave. The deceased was in his 82nd year.

Mr. R. H. Thompson, city engineer of Seattle, Wash., who was called in to consult with City Engineer Davis, of Prince Rupert, B.C., on the waterworks problem there, reports an ample supply at Woodworth Lake, sufficient indeed to supply the needs of a city of 700,000—Which leaves room for some development at Prince Rupert.

The members of the city engineering staff of Vancouver, B.C., recently presented Mr. W. A. Clement, the retiring city engineer, with a solid gold watch and fob as a souvenir of their regard. The presentation was made by Assistant Engineer Cooper. Mr. Clement, who has been city engineer at Vancouver for the last six years, is going into private consulting practice.

Constructional News and Items of Interest

A noteworthy contract was awarded at Victoria, B.C., recently when the bid of the Canadian Mineral Rubber Company, of Toronto, was accepted for the paving of 568,000 square yards of paving—nearly 30 miles.

Something in the nature of a cement famine is reported from Calgary, Alta., from which city an order has been sent to spokane for the immediate delivery of 5,000 barrels. The Canada Cement Company at Calgary attribute the shortage to the delay in the arrival of the hydro-electric power. At present they are obliged to rely upon a steam plant which necessarily means a small output.

The Montreal Board of Control is submitting a recommendation for water mains and sewers involving a total expenditure of $1,200,000.

Plans for the proposed dry dock at Montreal, as submitted by Messrs. Vickers, Sons & Maxim, have been approved.

A special committee of the Calgary city council recommends that in future buildings in that city be limited in height to ten storeys, or not more than 130 feet.

At Victoria, B.C., building permits aggregating in value $894,450 were issued during the first four months of the year, compared with $717,945 for the corresponding period of 1910, an increase of 23 per cent.

Saskatoon, Sask., continues to make remarkable progress. Last month the permits totalled $804,000, compared with $292,956 for April, 1910.

Fire in the works of Allis-Chalmers-Bullock, Limited, Montreal, caused damage estimated at nearly $100,000. The loss is amply covered by insurance.

Moose Jaw, Sask., expended a qaurter of a million in building last month, against $150,000 in April, 1910.

The Western Canada Cement Company has been incorporated at Edmonton with a capital stock of $1,500,000 Lieut.-Governor Bulyea is chairman of the directors of the company. The headquarters will be in Edmonton. The construction of a plant to develop [illegible] west of the city, near Edson, will be commenced at once.

The Canadian Cement Company will commence the erection of a $400,000 factory at Winnipeg this summer. The mill will have a capacity of 2,000 barrels a day. Senator Edwards, president of the company, and F. P. Jones, general manager, were in Winnipeg last week completing the preliminary details.

The Prairie Glass Company, of Winnipeg, has incorporated.

The Brown Construction Company, of Winnipeg, has obtained a charter.

Ernest N. Steele and W. A. McKay have formed a partnership as electrical contractors and will carry on business under the firm anme of E. W. Steel & Company, at Nelson, B.C.

Doyle & Thomas have started in the contracting business at Calgary.

Gracey & Crane have started an electrical contracting business at Calgary.

The Canadian General Supply Company, Limited, have commenced business in building and mining supplies at Lethbridge.

The McManus Construction Company, of North Battleford, has obtained a charter.

We are advised that the proceedings of the recent annual convention of the Canadian Cement and Concrete Association held in Toronto will be issued shortly. The report of the specification committee, embodying the labors of the committee during the past year, will also be ready at an early date. The executive report a successful season with a balance in the treasury after meeting all claims.

A. W. Berry & Company, contractors, of Boston, are establishing a branch at Moose Jaw.

The North Battleford Concrete Company will shortly commence the manufacture of cement blocks and pipe at North Battleford, Sask.

The plans of Storey & Van Egmond have been accepted for the new Carnegie Library to be erected in Regina. The plans submitted by F. C. Clemensha came second in the competition.

Mr. J. F. L. Thomas has opened an office at Winnipeg as representative of Vickers, Sons & Maxim, of Sheffield, Eng., and a plant will be erected.

Thos. Kelly & Sons, contractors, Winnipeg, have removed their offices from Nanton building to the Venus building, corner Notre Dame avenue and Princess streets.

Mr. McCrossen, city electrician, of Vancouver, has been obliged to engage two competent electricians as assistants in order to keep up with the work of inspecting the wiring being put in the hundreds of new buildings in course of erection in all quarters of the city.

The [illegible] Construction Company, a large and well known contracting firm of Minneapolis, has decided to locate in the Canadian West with headquarters at Moose Jaw, Sask.

Work on a factory for the [illegible] Concrete Company was commenced at Winnipeg recently. The dimensions of the building are [illegible]. The works are being erected on a 3½ acre tract, with railroad facilities. All machinery is now on the ground.

A despatch from Cordova, Alaska, states that the first [illegible] on the Copper River and Northwestern railroad has been run. The first ore from the Bonanza property in Copper mountain will be shipped next week to the Tacoma smelter. The railroad is less than 200 miles long, but cost [illegible]. It is owned by the Guggenheim-Morgan syndicate.

The Canada Iron Corporation, Limited

The Splendid Properties Owned by this Company in the Maritime Provinces, Quebec and Ontario — Extensive Use of Electricity

The Canada Iron Corporation, Limited, was incorporated in June, 1908. Under this firm name the following companies became consolidated: Canadian Iron & Foundry Company, Limited; Canada Iron Furnace Company, Limited; Annapolis Iron Company, Limited; and John McDougall & Company. One of the chief aims of the consolidated companies was to secure control of their own mines so as to be absolutely independent in respect to raw material. As a consequence this corporation now owns the following mines, blast furnaces, foundries and machine shops: Iron mines—Annapolis, N.S.; Bathurst, N.B.; Radnor, Que.; Drummondville, Que.; Eganville, Ont. Blast furnaces—Drummondville, Que., capacity 4,500 tons per annum; Radnor, Que., capacity 7,500 tons; Midland, Ont., capacity 150,000 tons. Car Wheel foundries—Hamilton, Ont., 40,000 wheels annually; St. Thomas, Ont., 40,000 annually; Fort William, Ont., 50,000 annually; Three Rivers, Que., 40,000 annually. Pipe foundries—Londonderry, N.S., capacity 8,000 tons per annum; Three Rivers, Que., 20,000 annually; Fort William, Ont., capacity 20,000 annually. Machine shops—Londonderry, N.S.; Three Rivers, Que.; Fort William, Ont.; Midland, Ont.; St. Thomas, Ont.; and Hamilton, Ont.

Mr. T. J. Drummond, President
Canada Iron Corporation, Limited, Montreal

Although the foundries are devoted largely to the manufacture of cast iron pipe and chilled cast iron car wheels, the corporation through its unusual facilities turns out a great variety of other products such as boilers, brake shoes, building castings, columns, hydrants, ore buckets, tank works, etc. From Fort William, where three transcontinental railways meet the head of inland navigation, through the valley of the St. Lawrence to the provinces by the sea there is the same effort to provide for Canadian demands by utilizing Canadian materials from the mine to the finished product.

Experience has shown that the most successful iron and steel manufacturers are those who control the raw material, and in this connection it may be said that the Canada Iron Corporation, Limited, now controls the most important iron mines known in Canada.

Mention might be made of the peculiar virtues of Three Rivers iron, which have been known since the earliest days of New France. In 1733 forges were erected for smelting the bog ores on the west side of the St. Maurice river, about eight miles above Three Rivers. The Radnor forges were established in 1860. This property includes not only the Radnor Works, but charcoal kilns and water power on the St. Maurice at Grand Piles, bog ore deposits at Lac-a-la-Tortue and rights over one hundred thousand additional acres of ore bearing lands and swamps in the district of St. Maurice. The corporation owns another extensive tract of bog ore bearing lands and swamps at Drummondville, Que., with about 4,000 acres of hardwood suitable for charcoal. There are also a large proportion of low grade magnetite at the corporation's Radnor mine near Eganville, Renfrew County, Ont., awaiting profitable treatment by magnetic concentration.

In the last half century enormous strides have been made in the reduction of iron ore and the most recent improvements have all been incorporated in the blast furnaces of the Canada Iron Corporation, Limited, at Midland, Ont. There are few sites more advantageous for the erection of blast furnaces.

The furnaces and yards occupy 44 acres of land and the corporation owns 687 acres immediately adjoining. The harbor is available for the deepest boats on the lakes and by the acquisition of the adjoining water lots the corporation has made provision for shipping facilities proportionate to its territory for all time to come. The ore supply is obtained chiefly from the Lake Superior district.

The corporation has a second modern blast furnace plant at Radnor, Que., which is on a branch of the Canadian Pacific Railway, about nine miles north of Three Rivers. A third blast furnace plant is situated at Drummondville. The operations here are similar to those at Radnor, charcoal pig iron being one of the principal products. The iron manufactured from these bog ores is soft, tough, clean, and close in texture, and has fine chilling qualities, the higher grades being admirably adapted for the manufacture of car wheels, and the lower grades for stove work.

The Canada Iron Corporation, Limited, was the first on the continent to make the process of casting pipe, vertically, a continuous operation. At the Fort William plant, where this product is turned out in immense quantities, there are two long parallel pipe pits joined by transfer cars and the pipe flask carriages are moved through them by an endless chain. The ovens are built over the end of one pit and fires from below. The pipe flasks, having been rammed in the other pit, are carried across by the transfer cars and onward slowly through the ovens. The hot metal is poured into them as they emerge and by the time they complete half of the circuit the freshly made pipes are ready to be stripped. In the Fort William plant all sizes of cast iron pipe are manufactured at the rate of 80 to 120 tons every twenty-four hours.

In adopting electric power wherever the conditions are favorable the Canada Iron Corporation, Limited, has followed the practice of the most modern plants in other countries. The first application of it to steel mill work was in the form of the direct current motor, but it was found that

Canada Iron Corporation's Plant at Fort William, Ont.—The Pipe Pits

Interior View of Car Wheel Shop at the Fort William Plant the induction motor was more suitable. The works of the corporation at Fort William are operated entirely in this way. Altogether there are 57 motors, aggregating over one thousand horse power.

Originally pipe varied a great deal in length and shape, but a specification standard has been adopted by the American Water Works Association which has greatly simplified matters. This standard has been adopted by this corporation and in due time it is expected that it will become the standard throughout Canada.

The car wheel which to the lay mind may appear unimportant as an article of equipment, is, after all, one of the most important features of a railway train. It has received the best attention that scientific minds could bestow upon it, and the finished article to-day is the product of the highest degree of skill that workmen can attain. The Canada Iron Corporation, Limited, manufactures chilled cast iron car wheels of single plate, double plate, reinforced and spoke patterns; and steel tired wheels with cast iron, wrought iron, cast steel or forged steel centres. It also makes a specialty of wheels of small diameter loose, or mounted on axles, with or without bearings, for contractors' equipment. In Canada there are over one million car wheels in daily use and of these fully 90 per cent. are made of chilled cast iron. Experience has proved that wear of car wheels depends upon the chill. Car wheels are made at Fort William, St. Thomas, Hamilton and Three Rivers.

Montreal Building Notes

Messrs. Wright & Son are the architects for an apartment house containing 24 dwellings on Lincoln avenue. The building is being erected by Mr. J. H. Hand at a cost of some $40,000.

An apartment house to contain 19 dwellings is being erected at the corner of Labelle and Berri streets, for the estate of Madame Therese Ouimet. The structure will cost $40,000. The architect is Mr. G. A. Monette, and the contractors, Messrs. Marsen Brothers.

A house to contain 12 families is being erected on St. Charles street for Mr. Isaac L. Hibbard at a cost of $35,000. The architect is Mr. J. E. Adamson, and the builder, Messrs. Alex. MacKay & Company.

The Catholic School Commissioners of the parish of the Infant Jesus in Laurier Ward are rebuilding the girls' school at the corner of Boulevard St. Joseph and Cadieux street, which was burnt down a couple of monthe ago. The new structure will for the present be only two storeys high with a basement, and the cost will be $55,000. The architect is Mr. Dalbe Viau, and the contractors, Messrs. A. Kelly & Company.

Good progress is being made in the erection of the steel work for the new Dominion Express Company's building at the corner of St. James and St. Francois Xavier streets. The concrete columns sunk by the Foundation Company had only been down a week or so when the steel work began to go up. More than half of the ten storeys of steel frame is now in place. Messrs. Peter Lyall & Sons are the contractors.

The work of demolishing the old seminary buildings on St. James and St. François Xavier streets opposite the post office is proceeding rapidly. Under the direction of Messrs. Peter Lyall & Sons the building has seemed to melt away, so that within two weeks of the time the razing operations began the old buildings disappeared from the site on which will be reared within the next twelve months the new Transportation Building, whose reputation is that it will be the largest office building in existence in Canada.

Rapid progress is being made with the additions to the General Hospital. This contract is in the hands of Messrs. John Stewart & Company, general contractors, with the Structural Steel Company and F. J. Jago & Company as sub-contractors, in addition to the Bishop Construction Company, who put in the foundations. Messrs, Edward & W. S. Maxwell are the architects.

Obituary

We regret to report the death of Mr. Alexander Niven, the well-known land surveyor, of Toronto. The late Mr. Niven was born at Niagara-on-the-lake in 1836.

The death occurred last week at Regina of Mr. Robert B. Watson, Inspector of the Department of Public Works for the province of Saskatchewan.

Mr. Thomas Pringle, the well-known Montreal hydraulic engineer, and founder of the firm of T. Pringle & Son, died last week. The deceased gentleman was born at Huntingdon, P.Q., in 1829. In 1850 he started business in Montreal as a milling engineer and for many years was prominently identified with numerous water power developments and mill building operations throughout Canada. Early in the sixties the late Mr. Pringle reported upon power development on the Lachine Rapids. Many years later, in 1891 in fact, Mr. Pringle reported a second time on this power in the interests of the Royal Electric Company. In the following year he reported on Chamblay water power for the same concern. He was closely associated with the late Mr. W. MacLea, Walbank, and the two played an important part in the formation of the Lachine Rapids Hydraulic and Land Company, which in 1903 passed into the control of the Montreal Light, Heat and Power Company.

The Missisquoi Marble Company, Phillipsburg, Que., has increased its capital stock from $500,000 to $1,000,000. It is understood that the company will make a number of enlargements at its property in order to meet the growing demand for its product, which is richly veined and regarded by architects and builders generally as oneof the highest grade marble quarries.

Mr. H. P. Anderson, having disposed of his interest in the Andresen-Evans Company, of Chicago, Ill., of which he was formerly vice-president and chief engineer, is now the sole owner of Canadian patents relating to the Andresen-Evans grab bucket as well as ore and coal handling plants. He has opened an office at Room 16, Liverpool and London and Globe Building, 112 St. James street, Montreal, where, in addition to his own line, he will handle the Milwaukee concrete mixer for the eastern half of Canada.

Automatic Sash Holder

A device for automatically holding a window in any position without the use of cords, weights, or pulleys is the sash holder which has been introduced to the trade by the Automatic Sash Holder Company, 277 Broadway, New York city. A small metal rachet wheel is sunk in each side of the window sash, and by means of two short spiral springs is made to press firmly against the inside of the frame. The body of the holder requires only an easily made mortise in the side of the sash, about 3¼ x ⅞ x 1 5/16 in., all of which can be done with a ⅞-inch auger bit and chisel. The claim is made that the sash holder is equally suitable for old or new construction, but in the latter case there is a great saving both in material and freight as well as bulk by having window frames made without weight pockets, and that owing to constant side pressure the windows, regardless of swellings or shrinkings, will always fit snugly and thus not rattle.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Amherstburg, Ont.

Tenders for drainage in Malden, Essex County, will be received until May 25th. Information obtained from James Honor, tp. clerk. Estimated cost, about $20,000

Banff, B.C.

Tenders for material for extensions to the waterworks here will be received until May 25th. There will be required: 1,680 feet 4-in. cast iron pipe; 2 4-in. gate valves; 3 specials, 6-in. off 4-in. T.; 2 specials, 4-in. off 8-in. T.; 1 special, 4-in. with 45 degree bend; 3 extension valve boxes for 4-in. valves for 6-foot trench; 1 extension valve box for 8-in. valve for 6-ft. trench; 2 two-way standard hydrants for 6-ft. trench, nozzle and thread of these hydrants must correspond with the "Toronto Hydrant." Lyndwode Per-

Barrie, Ont.

The citizens are considering the question of permanent paving for this year.

Calgary, Alta.

The city will erect a sewage disposal plant on the site recently purchased from Mr. Theinbolt.

Tenders will be called shortly for construction of a 6-ft. concrete trunk sewer, length about 3 miles. By-law for $318,000 was carried recently for same.

Collingwood, Ont.

Tenders will be called within the next three weeks for some two miles of sewers. Nothing definite has been decided in regard to the bituminous paving under consideration by the council.

Tenders are called until May 31st for construction of all-concrete sidewalks to be laid during the year 1911. K. S. Macdonell, city engineer. Advertisement in "Tenders and For Sale Department" of this issue.

Edmonton, Alta.

It is reported that the commissioners have decided to call for new tenders for pumping machinery.

Fort William, Ont.

A by-law will be voted on on May 29th for construction of another 12-in. force main leading from the power house, and also another [illegible] the hill, 50 ft. diam. by 100 ft. high.

The city council is considering the paving of about five streets. Estimates are being prepared for asphalt block, sheet asphalt, [illegible] and roemac.

Ingersoll, Ont.

The Board of Health have recommended the council to institute a sewerage system for the town.

Lethbridge, Alta.

Tenders are called until May 31st for the following: street grading, about 130,000 cubic yards; cement sidewalks, about 45,000 square yards; water mains, about 10 miles; sanitary sewers, about 6½ miles; storm sewers, about 28 miles. Plans, etc., with C. M. Arnold, city engineer. E. Adams, mayor.

MaKinak, Man.

Tenders addressed to J. N. Campbell, secretary, Makinak Improvement Committee, will be received until May 20th for construction of about 5,000 square feet (more or less) concrete sidewalk here.

New Liskeard, Ont.

Tenders addressed to P. R. Craven, clerk, will be received until May 31st for supply of No. 1 vitrified sewer pipe and laying of it, including the supplying of cement and gasket, etc. C. H. Fullerton, town engineer.

Ottawa, Ont.

The waterworks committee have recommended to the city council that three by-laws, calling for an expenditure of a million dollars, be submitted to the property holders of the city for ratification. The first by-law calls for the expenditure of $150,000 to finish the work on the aqueduct. The second is for $40,000 for main extensions, and the third for $60,000 for the installation of a booster system.

It is stated that the paving of Little Sussex, Besserer and Mosgrove streets will be proceeded with at once. City Engineer, N. J. Ker.

Prince Albert, Sask.

Tenders are called until May 31st for extensions to water and sewerage systems, construction of concrete sewage pumping station No. 2 ,supplying and erection of two electrically driven centrifugal sewage pumps and motors. Advertisement in "Tenders and For Sale Department" of this issue.

Olds, Alta.

[illegible] per day.

Quebec, Que.

[illegible] for the following paving material with [illegible] large, City Engineer

Richmond, B.C.

[illegible] part of which will be used to purchase [illegible]

Regina, Sask.

Additional paving this year will probably be done on 16th avenue between Broad and Albert streets, 12,000 square yards; Rose street between 16th and Victoria avenues, 64,000 square yards; also Albert and Broad street between Victoria and 16th avenue, 10,000 square yards each.

Stettler, Alta.

The citizens voted in favor of the grading of streets, construction of sidewalks and crossings.

Shawinigan Falls, Que.

The municipality will macadamize 1,200 feet of road this summer by day labor, for which they have all the machinery required. For the 4,000 feet of proposed sewer, the pipe and wood for sheating, brick for manholes and manhole frames and covers will be required.

Tenders may be called for the three-quarters of a mile of road to be opened on Melville Island.

This municipality contemplate the installation of a turbine pump of 1,500,000 gallons.

Toronto, Ont.

Tenders are called until May 23rd for concrete walks, concrete curbs and sewers. G. R. Geary, Mayor.

Sarnia, Ont.

Tenders are called until May 27th for repair of the Perche drain in Tp. of Sarnia. R. Beattie, reeve. Advertisement in "Tenders and For Sale Department" of this issue.

Victoria, B.C.

The following by-laws will be submitted to the ratepayers on May 18th. For sewer and surface drainage extension, $300,000. For the purchase of additional park and playground sites, $235,000.

Waterloo, Ont.

Tenders are called until May 29th for various kinds of pavements in this town. F. S. Kumpf, town clerk. Advertisement in "Tenders and For Sale Department" of this issue.

Windsor, Ont.

A by-law will shortly be submitted to the ratepayers of the city authorizing a $50,000 bond issue for the purpose of extending the water mains.

AWARDED

Burlington, Ont.

Messrs. Elliott and Riley have secured the contract for a number of concrete sidewalks

Fort William, Ont.

[illegible]

Ottawa, Ont.

[illegible] street from Bank to Bay streets were received by the board of control and the contract awarded to the Ottawa Construction Company, whose tender was the lowest. The amounts were, Ottawa Construction Company, $14,999; Union Construction Company, $15,470; and Barber Asphalt Company, $15,780.

The contract for paving Fairmount avenue from Wellington street to near the G. T. R. tracks was awarded to the Union Construction Company for $9,563, the lowest tenderer. The other tenders were, Ottawa Construction Company, $9,985; Barber Asphalt Company, $10,590. In both instances the Barber Asphalt Company's tender was declared irregular as the guarantee cheque was not sufficient.

Prince Albert, Sask.

The council accepted the commissioners' recommendation in regard to acceptance of tenders, as follows. Canada Iron Corporation for cast iron pipe and specials; Dominion Sewer Pipe Co., for sewer pipe and junctions; Agnew Bros., cement at $3.26¼ per barrel for Canada Brand; Mussens Limited, hoisting drum; Agnew Bros., for hardware; the Manville Hardware Co., oils, iron pipe and pipe fittings, also for gasoline; Canada Foundry Co. got the contract for a new cement mixer, complete at $2,309.65; the Hamilton Machine Company's tender for a stone elevator at $1,145 was accepted. The Climax Good Roads Co. put in a tender for $395 but the commissioners, after last year's experience wtih a machine costing $650, decided in favor of the first named, Hamilton Machine Co., road plow, $40.00.

Regina, Sask.

The Ontario Asphalt Block Company have been awarded the contract for electric street car track paving, consisting of about 20,000 square yards at $2.68 per square yard.

South Vancouver, B.C.

It was decided to do the grading on Main street between Fifty-first and Sixty-third avenue by day labor. Six dump carts will be purchased at $51.40 each, from E. G. Prior & Co., providing the same are satisfactory to the engineer.

Tenders were opened for a topographical survey of the municipality, a rock crusher site, the supply of pipes and fittings for the extension of the water works system, the purchase of additional fire fighting equipment, the purchase of dump carts, the position.

In the former case the tender of Mr. M. L. Gordon of $2,100 was accepted, the work to b ecompleted within three months. This was by far the lowest tender, the next lowest being $3,900. Other offers were $4,150, $4,900, $4,925, $5,840, $6,500, $7,070, approximately $11,500, and one on $27,200. D. Philpot was awarded the contract for grading Westminster road at $10,012 (74 cents per cubic yard), the work to be done in eight weeks. The grading of Fraser street between Fifty-first and Fifty-ninth avenues was awarded to F. C. Lane at $3,540, work to be complete. in four weeks.

Railroads, Bridges and Wharves

Beaumaris, Ont.

Tenders are called until June 12th by the Public Works Department for construction of wharf, etc., here. Plans, etc., at offices of J. G. Sing, district engineer, Toronto; H. J. Lamb, district engineer, London, and on application to local postmaster. R. C. Desrochers, secretary. Noted in last issue.

Cape Rouge, N.S.

Tenders are called until May 31st by Public Works Department, Ottawa, for construction of a landing wharf here. Plans, etc., at offices of the district engineers at Antigonish, Halifax, at above department and on application to the local postmaster.

Edmonton, Alta.

The city commissioners have instructed City Engineer Latornel to prepare plans and specifications for subways under G. T. P. and C. N. R. tracks on Namayo, Syndicate and First streets.

Hickson, Ont.

Tenders addressed to James Anderson, clerk, East Zorra, will be received until May 29th for a bridge in the Tp. of East Zorra.

Montebello, Que.

Tenders are called by Public Works Department, Ottawa, until June 12th for construction of wharf here. Plans, etc., at this department, at the office of District Engineer, Merchants Bank Building, St. James street, Montreal, on application to the local postmaster.

Mulgrave, N.S.

Tenders are called by Public Works Department, Ottawa, for construction of wharf here. Plans at this department, at the offices of District Engineers at Halifax, Antigonish, N.S., and on application to the local postmaster.

Macgillivray Bridge, Ont.

Tenders addressed to Geo. H. MacGillivray, tp. clerk, Charlottenburgh, will be received until June 5th for construction of two concrete abutments on the site of the South Branch bridge, also the removal of the old bridge and foundation and necessary excavation, pile driving and coffer damming (if necessary), and supply of material; for all material and labor necessary for erection of a steel-rivetted Warren truss bridge span, between 45 and 50 feet in length with concrete flooring and pipe railing. Specifications at residence of the Reeve, G. B. Cain, Grant's Corners, or at the office of the above.

The Dominion government will place $80,000 in the estimates for the construction of an overhead bridge across the Rideau canal at Bank street. A reinforced concrete bridge is proposed to cost about $130,000, the remainder of the cost to be borne by the city. The electors will be asked to vote on it.

Port Arthur, Ont.

In the Commons Railway Committee to-day a bill was considered incorporating the Quebec and Great North-Western Railway Company, whose purpose is to build a line of railway from Port Arthur to Quebec with a branch to Ottawa and Montreal. The directors are Dr. R. Cheverier, P. O'Reiley, P. Clarke, and E. J. Daly, of Ottawa, and Jos. Bourque, of Hull.

Roxton Falls, Que.

Tenders are called until May 20th for construction of two steel bridges of 86 feet in length and also for construction of four abutments in concrete. Plans, etc., prepared by engineer of Public Works Department of Quebec, at office of the secretary-treasurer, L. Tranchemontagne.

St. John, N.B.

The Provincial government, the St. John Railway Company, and the C.P.R. may unite for the joint erection of a new bridge across the reversing falls here. The citizens of St. John have voted to grant $300,000 towards the erection of a $1,000,000 bridge farther down stream at the head of the harbor.

Shawinigan Falls, Que.

Tenders have been called by the municipality for construction of bridge across the St. Maurice river. Cost, about $40,000. Contract will probably be awarded this week.

Toronto, Ont.

Tenders addressed to Barber & Young, York County Engineers, will be received until May 30th for construction of concrete abutments for bridge over Humber river. Advertisement in "Tenders and For Sale Department" of this issue.

Windsor, Ont.

The government estimates provide for a new dock here, $30,000.

Welland, Ont.

Tenders are called until May 27th for erection of one large concrete arch across Lyons' Creek and seven smaller ones for the Tp. of Crowland. Information with Reeve, O. A. McKenney; H. L. Pratt, Tp. Clerk.

Woodstock, Ont.

Tenders for construction of three small concrete bridges in the Tp. of Blenheim addressed to E. J. Ure, county engineer, will be received until May 20th. Plans, etc., at office of the above, or at the home of J. O. Given, reeve.

Public Buildings, Churches, Schools, etc.

Brantford, Ont.

The Y. M. C. A. building campaign has closed with $117,000 to its credit.

Barrie, Ont.

The plans for the new collegiate as a whole have been approved by the Educational Department, Toronto. Mr. Colquhoun, deputy minister.

Blairmore, Alta.

The school trustees here have been authorized to borrow $5,000 to erect a school.

Black Mountain, B.C.

Tenders are called for a large one-room school until May 31st by Public Works Department, Victoria.

Calgary, Alta.

There is some talk of the tSarland Picture House Co. building a vaudeville and picture house to cost about $100,000.

Plans are in preparation for six new schools. Tenders will be called in a few days. Each building when complete will cost about $4,000.

Tenders for heating, ventilating, and plumbing in the new civic market, will be called for in a few days. Cost, $38,400.

Tenders addressed to F. J. Lawson,

Norman Block, will be received until May 20th for erection of a club house for the Calgary Golf and Country Club, South Calgary. Plans, etc., at office of the above.

Cobourg, Ont.

Tenders for steam heating of Victoria Hall here will be received until June 1. Plans, etc., at office of the County Clerk, Cobourg, George Greer, chairman of committee.

Collingwood, Ont.

P. C. Palin is the architect for the new fire hall to be erected here. Plans are being prepared. Estimated cost, $12,000.

Cranbrook, B.C .

Plans are being prepared by Mr. J. J. O'Gara, architect, of Calgary, for the brick addition to the St. Eugene Hospital.

Essex, Ont.

Tenders are called until May 31st by Public Works Department, Ottawa, for erection of public building here. Plans, etc., at the office of H. J. Lamb, district engineer, London, Ont., at the postoffice, Essex, Ont., and at this department.

Fleming, Sask.

The ratepayers of the school district here have passed a resolution requesting the school trustees to proceed with the building of a new school.

Fort William, Ont.

Tenders are called until May 27th for reconstruction of St. Peter's Church. Plans, etc., at 705 McIntosh street.

Tenders are called until May 22nd for alterations and additions to Central school. Plans, etc., with R. E. Mason, architect. Victoria Block.

The plans for the new Salvation Army Citadel have been changed to admit of a building to be used strictly for Army purposes only. Captain Walker is in charge.

Tenders addressed to R. E. Mason, architect, Victoria Block, will be called until May 22nd for alterations and additions to Central school. Plans, etc., at office of the above.

The plans have been approved for the addition to Central school. Options on a site in the Wayland addition will be taken for a school.

Georgetown, Ont.

Tenders addressed to secretary, public school board, will be received until May 20th for heating by steam of public school here. Plans, etc., at office of the above.

Hamilton, Ont.

The First Methodist Church have about decided to build a new church on the old site. Plans have been prepared by E. B. Patterson. Contracts not yet let

Congregational church has bought ground on Main street east for the proposed new church in the near future.

Herbert, Sask.

A new school will be erected. A by-law for $12,000 will be submitted shortly.

Hull, Que.

The offer of the Sisters of Providence of Montreal, in regard to the taking over of Hull hospital has been definitely accepted. By this contract the Sisters of Providence agree to erect a $43,000 hospital. Mayor Archambault.

Kindersley, Sask.

A new school costing about $30,000 will be erected here this summer.

Lennoxville, Que.

Mr. J. W. Gregoire, architect, Sherbrooke, is preparing plans for an academy to be erected here. Approximate cost, $15,000.

London, Ont.

The plans prepared by W. G. Murray for the new Masonic Temple have been accepted. Estimated cost of building, $45,000. C. W. McGuire, president.

Medicine Hat, Alta.

The Royal Bank have purchased the property owned by the Methodist Church, corner of Fourth avenue and Toronto street, which will be remodelled for their use. The church have property on corner of 5th avenue and Montreal street and are about to engage an architect to complete the plans for erection of new church. The church have the use of the church on property purchased by bank for one year from date.

The plans of Clemsha and Coltenan of Regina, were accepted for the construction of the new St. Barnabas church. Tenders closed on May 19th. Pressed brick with heavy stone trimmings. Estimate of cost, $30,000. Plans, etc., with Mr. H. W. Ireland, Medicine Hat, and with Clemsha & Coltenan.

Montreal, Que.

Tenders are being called for extensive additions on the north and east sides of the Engineers' Club, Beaver Hall Sq. The additions will conform to the general style of the existing building, which is of grey cut stone and two storeys high. The cost will be approximately $90,000. The interior will be richly furnished and decorated. Palns and specifications have been prepared by Messrs. Saxe & Archibald, 59 Beaver Hall Hill.

Plans and specifications are being prepared by Mr. H. C. C. Stone, architect, for extensive alterations and additions to the St. James' Club, Dorchester street.

Mr. Alphonse Piche, architect, is preparing the plans for the new O'Connell bath to be erected in St. Ann's Ward. Cost, about $30,000.

Plans and specifications have been prepared by Mr. Alphonse Piche, architect, of Montreal, for the new post office to be erected by the government in the city of Westmount. Tenders will be called for shortly.

The Norwood School Board and representatives of Ahuntsic are discussing the ways and means of increasing the school accommodation in their district which at present is not under the jurisdiction of the Protestant Board of School Commissioners of Montreal.

Moose Jaw, Sask.

A by-law for the raising of $75,000 for hospital extension will be prepared.

A campaign will be started by the Y. M. C. A. to raise $50,000 for their proposed new building. President, Mrs. Alexander.

Nelson, B.C.

[illegible] to raise $35,000 for proposed hospital, and a by-law will be submitted to authorize the borrowing of $15,000 by the [illegible] purpose.

Oshawa, Ont.

Plans have been approved by Dominion government for the extensions and additional postal boxes for the new post office. Twenty-one new collection boxes are to be installed in different parts of the town and an illuminated clock set in the tower.

Ottawa, Ont.

Fifty thousand dollars was voted by the Dominion government to make improvements to Rideau hall.

The specifications for departmental building are in the hands of the printer and tenders will be called this week or at latest, week after.

Tenders are called until May 22 by Public Works Department for supply of hot water boilers, etc., for printing bureau. Plans, etc., at above department. R. C. Desrochers, secretary.

In the suplementary estimates provision to the extent of $100,000 is made for a new Printing Bureau.

$25,000 has been set aside for alterations to the old Museum building on Sussex street.

Owen Sound, Ont.

Tenders are salled for the removal of the buildings on the site required for the new public library. W. H. Taylor, secretary, library board.

The Board of Education will erect two new schools, one in Owen Sound north and the other on East Hill. $30,000 was voted by the board, which will partly cover the expenditure entailed. J. R. Brown, chairman of the building committee.

Petawawa, Ont.

The Ordnance stores building and others were destroyed by fire on the 12th inst. Estimated loss, about $25,000.

Portage la Prairie, Man.

It is reported that W. A. Snyder has been given the contract for erection of Armory here.

Port Hope, Ont.

Two new schools are under consideration here, the new Central School, cost, $40,000, and primary school. Option good until July has been taken on a building site for the latter on the Athletic Grounds. Dr. Powers, chairman public school board; Mr. Ellis, of Ellis & Connery, Toronto, architect.

Red Deer, Alta.

It has been decided to proceed at once with the erection of the main building of the proposed Ladies' College here to cost about $65,000. Col. Walker, Calgary, Alta., president; G. W. McKenzie, secretary.

Revelstoke, B.C.

Tenders addressed to the Minister of Public Wroks, will be called until May 31st for erection of court house here. Plans, etc., at offices of the government agents here, and at Nelson, Kamloops, and New Westminster; Provincial Timber Inspector, Vancouver, and at the Department of Public Works, Victoria [illegible] public works engineer

Rossland, B C.

Tenders are called until May [illegible] for [illegible]

Saltcoats, Sask.
By-law has been passed for erection of a $15,000 town hall at an early date.

Shawville, Que.
Tenders were called until May 10th for erection of Academy here. W. W. Ireland, secretary-treasurer school board.

South Vancouver, B.C.
Tenders will be called at once for a municipal hall, to cost about $15,000.

Stratford, Ont.
The supply committee submitted recommendation for erection in Romeo Ward of a new 4-roomed school.

Strathcona, Alta.
Tenders are called by public works department, Ottawa, until May 29th for construction of Armoury here. Plans at the office of Mr. J. E. Cyr, superintendent of public buildings for Manitoba, Winnipeg, Man.; Mr. W. T. Mollard, clerk of works, Regina, Sask., on application to Mr. W. G. Congdon, clerk of works, new post office, of Strathcona, Alberta, and at above. R. C. Desrochers, secretary.

Sturgeon Creek, Man.
The foundation is being put in for the new school, eight rooms, costing $59,000.

Sutherland, Sask.
Tenders were called until May 15th for erection of town hall here. J. J. O'Neill is interested.

St. John, N.B.
Tenders will be called for shortly for a new building for the convent of the Good Shepherd on Cliff street. The new building will cost in the vicinity of $75,000. Tenders were called for previously but on being opened it was found that the building was to cost rather more than anticipated. Some revision will therefore be made and tenders called for again. The work is in charge of C. W. West, C.E., of Newport, New Virginia. The structure will be forty-three feet deep with wings 120 feet each way "E" shape, and will be three storeys with a basement, the entire of brick.

Trail, B.C.
The by-law to authorize the expenditure of $25,000 for school sites will be submitted on May 19th.

Toronto, Ont.
The residents of Fisherman's Island have petitioned for a new public school.

Work will start at once on the new St. Jude's church on Roncesvalles avenue. Rev. J. L. P. Roberts, rector.

The public library board has selected a site for the branch library at the corner of Bloor street and Dovercourt road.

A new public school will be built in Ward One. Superintendent of Buildings, Mr. Bishop.

The Toronto Hunt and Polo Club will erect a new club house of stucco, to cost about $40,000, in East Toronto. F. Pearson, Darling & Pearson, architect.

Tenders for erection of Deer Park Presbyterian Church will be received until May 19th. Plans, etc., at office of Sharp & Brown, architects, 18 Wellington street east.

Tenders addressed to the chairman, building committee, will be received until May 27th for erection of Servants' Building for the Toronto General Hospital. Plans, etc., at office of the architects, Darling & Pearson, 2 Leader Lane.

Tenders addressed to G. R. Geary, chairman, board of control, are called until May 22nd for erection of Shelter building for the city of Toronto in St. Andrew's supervised playground. Specifications at office of the Parks Department, City Hall.

At a special meeting of the Northern Congregational Church a building committee consisting of J. H. Nasmith, A. W. Thomas and F. J. Smith was appointed to report on the erection of a new church building on the property at the southeast corner of Bloor and Jarvis streets.

The property at the corner of University avenue and Anderson street was purchased by the Ontario government as the site for the new Ontario Veterinary College, and building operations will start next autumn. Cost, $25,000. C. C. James, Deputy Minister of Agriculture.

At a recent meeting of the publishing department of the Methodist Book-Room the question of Metropolitan Square as the building site for the contemplated building was not considered favorably. Other sites were discussed, the one now occupied by the Carlton Street Methodist Church being favorably considered as a good site for a large office building. The reported sale of this has not been sanctioned by Conference.

Vernon, B.C.
Tenders were called until May 8th for erection of fire hall in Vernon. D. G. Tate, clerk.

Winnipeg, Man.
By-law for the erection of a $50,000 school for Brooklands was carried.

The University authorities will spend about $20,000 in beautifying the site for university in Tuxedo Park.

Tenders are to be called at once for erection of new council rooms for the municipality of St. Charles.

At a recent meeting of Hebrew citizens it was decided to erect a substantial school building to accommodate from 800 to 1,000 children on a site which has been purchased on the corner of Flora avenue and Charles street. The site is 66 by 120 feet, and the building will be three storeys in height with 16 class rooms. Its estimated cost is about $39,000. Plans have been prepared by M. Blankstein, architect. Tenders will be called at once.

AWARDED

Calgary, Alta.
The contract for three Alto furnaces in the civic market building has been awarded to the Western Foundry & Metal Co., Ltd.

Florence, Ont.
The contract for new concrete block and frame construction church here has been awarded to Reid Bros., Bothwell. Building, to commence at once. All ceilings to be metal; hot air heating.

Montreal, Que.
The contract for erection of building for the Montreal Art Association, to be built of gray marble, it is stated, has been awarded to the Norcross-West Co., of Manchester, N.H., branch at Sherbrooke, Que.

Orillia, Ont.
Joseph Langland has been given the contract for building a verandah on the Orillia Hospital for the Feeble-minded. The cost will be in the neighborhood of $2,500.

Renfrew, Ont.
The contract for the erection of a new separate school has been awarded to the Renfrew Planing Mill, which is owned by Mr. J. O'Brien, $28,740. John Conley, of Renfrew, will do the plumbing and the James Smart Company, of Brockville, will put in the furnaces. Total cost, $32,590. C. P. Meredith, Ottawa, architect.

Sherbrooke, Que.
The contractors, Lefevre & Boivin, have commenced work on the extension to St. Charles Seminary at a cost of $75,000.

Toronto, Ont.
Contracts were awarded for the erection of the new addition to the Annette street school, at a cost of about $43,400, and of an enlargement to the Earlscourt school, costing $14,151. The successful tenderers are as follows: Annette school, masonry, J. C. Bayliss & Son, $15,500; carpenter, Crocker & Drew, $14,400; plastering, W. J. Haddock & Son, $3,230; painting and glazing, J. Phinnemore, $1,775; heating, Fred Armstrong, $1,998; heat and regulation, Johnston Temperature Regulating Co., $1,015; structural steel and iron, Reid & Brown, $1,995; roofing and tinsmith, John T. Flowers, $1,867; terra cotta fireproof floor, Robert Bennett, $1,620; Earlscourt school, masonry, H. Lucas & Son, $11,620; terra cotta, R. Bennett, $4,598; carpentering, F. Armstrong, $7,447; plastering, W. J. Haddock & Son, $1,309; painting, James Phinnemore, $695; structural steel, Reid & Brown, $775; roofing and tinsmith, John T. Flower, $1,727. Grace street school, cabinets, Simpson Planing Mill, $50; Humberside Collegiate, iron cornice, G. Duthis & Son, $242.

Vancouver, B.C.
The contract for erection of the Lord Nelson school has been awarded to D. Matheson, $73,300.

Residences

Collingwood, Ont.
Tenders will shortly be called for new residence for A. D. Cayley. It will be of pressed brick. Estimated cost, $7,000. Architect, Mr. J. Wilson.

Calgary, Alta.
Plans are under way for an apartment house to cost about $25,000, for Mr. Douglas. Architect, Mr. Leo Dowler, M.A.A.A.

Messrs. Holman & Gotch, A.R.I.B.A., architects, Room 8 Herald Block, have plans for the following: Apartment and stores block for Mr. Nimmous, $17,000; residence for Mr. Jones, $13,000; residence, E. D. Adams, $9,000; residence for Mrs. V. Smith, $3,000; Methodist parsonage, $3,000; residence for E. Telfer, $5,000; double house for W. Wrigley to cost $5,000.

Vancouver, B.C.
Plans have been filed for a 6-storey apartment house, corner of Bute and Nelson streets, 66 x 132 feet.

Winnipeg, Man.

Tenders addressed to E. D. Tuttle, architect, 701 McArthur Building, will be received until May 18th for erection of residence for W. H. Morgan.

Business Buildings and Industrial Plants

Buckingham, Ont.

The Cosgrove Block, owned by Mrs. Cosgrove, Ottawa, and the McCallum and Labie Blocks were destroyed by fire on the 8th inst.

Belleville, Ont.

The Industrial Committee will recommend that a free site, etc., be given to the Allard Platinum and Gold Refinery Company, of Rochester, N.Y., seeking location here.

Buckingham, Ont.

Messrs. McCallum & Lahale have commenced to clear away the debris preparatory to the erection of the new Bank of Ottawa building to replace the one recently destroyed by fire.

Carleton Place, Ont.

J. P. McLaren, architect, of Ottawa, is calling for tenders for the Union Bank at Carleton Place. It will be a two-storey solid brick building with pressed brick facings and stone trimmings.

Collingwood, Ont.

Plans are being prepared by Mr. J. Wilson, architect, for additions and alterations to Arlington Hotel. Estimated cost, about $6,000.

Calgary, Alta.

Plans are being prepa.ed by Leo. Dowler, architect, for an hotel estimated to cost $75,000 for Mr. C. Rhol.

Excavation has commenced on the site for addition to Pryce-Jones, Ltd.'s store here. J. J. Hill, local manager.

Plans have been prepared by the architect, L. Dowler, for a large business block, estimated to cost $29,000. Plans have been sent to the owner, J. S. Dismore, Esq., London, Eng., for approval.

Application will be made for a building site by a company newly incorporated to manufacture nails in this province. W. E. Davies and N. Shaw are interested.

The Alberta Engineering & Construction Company contemplate the erection of a structural steel shops with foundry and a machine shop in connection with same and are looking aroud for a suitable site.

Edmonton, Alta.

A large business block is to be erected on First street covering the full size of the 50-ft. lot. For further information apply Alberta Investment Company.

Guelph, Ont.

The Guelph Stove Company plan an addition to their plant in the near future.

Plans for the new plant of the International Tire Company have been prepared by Architect A. A. Mahoney. If the by-law carries on May 29th work will be started at once.

Hamilton, Ont.

The Bank of Nova Scotia propose erecting a new bank building at an early date.

The Hamilton Bridge Works are calling for tenders for foundations for their new east end plant.

The International Harvester Co. will have an addition built to their wood shop at East Hamilton.

G. H. Lees, manufacturing jeweller, plans extension to his plant on Main street. W. A. Edwards, architect.

Tenders will be asked shortly for business building and apartments to be built for Messrs. S. D. Biggar and J. G. Gaul.

The Sawyer Massey Company and Canadian Westinghouse Co. are planning further extensions; also the Diamond Flint Glass Company will double their plant.

Montreal, Que.

Ingram & Co., organ builders, London and Liverpool, Eng., will build a manufacturing plant here. E. Ingram, managing director.

The work of demolishing the stores and residences on the site of the new Birk's Building to be erected on the southwest corner of Cathcart and University streets, has been begun.

Medicine Hat, Alta.

The Medicine Hat Milling Company propose enlarging their plant at an estimated cost of $60,000.

Plans for a 3-storey office building, 50 x 130, are being prepared by Mr. Binning. Estimated cost, $35,000. Tenders may be called later.

Plans have been prepared by W. T. Williams for Hutchison block, Toronto street, pressed brick with stone trimmings. Estimated cost, $25,500.

Mr. W. R. Hull, of Calgary, is having plans and specifications prepared for a building on Toronto street, 125 x 130, two storeys; cost, $75,000, and will contain opera house, stores and offices.

The by-laws concerning location of Alberta Foundry & Machine Company, Glass Works ($80,000), Gordon Wire & Nail Works, $40,000, and Preston Planing Mills will be submitted on May 26.

Mr. Strong, of Calgary, is the representative of the Alberta Linseed Oil Company. The by-law regarding the erection of plant has been carried. Work will commence at once. Noted in issue of April 2nd.

Plans and specifications have been completed by Mr. W. T. Williams, architect, for a two-storey block with full basement for J. C. Beveridbe. Stone front, brick walls. Estimated cost, $25,000. Plans on file at Mr. W. T. Williams's office.

W. T. Williams, architect, is preparing plans for a block for Mr. [illegible] in this city. Cost, $25,000. Mr. W. T. Williams is preparing plans for the extension of the Cosmopolitan Hotel. The addition will be three storeys, [illegible]. Estimated cost about [illegible].

North Moncton, N.B.

Tenders addressed to A. W. Campbell, chairman, Government Railways' Managing Board will be received until May 20th for construction of addition to the General Office Building here for the Intercolonial Railway. Plans, etc., at the chief engineer's office here.

Ottawa, Ont.

J. A. Ewart has plans prepared for the addition to the factory for McFarlane & Douglas on Slater street.

J. P. McLaren is calling for tenders for alterations to Mr. G. H. Perley's building on the corner of Bank and Somerset streets.

Another change has been made in the building being erected by Hiram Robinson on Queen street. This building will now be six storeys instead of four and will cost about $70,000. James Mathier, architect.

A. LeB. Weeks will call for tenders this week for an addition to John M. Garland & Sons' warehouse at the corner of Queen and O'Connor streets. The new building will be six storeys high and will be of reinforced concrete construction. Estimated cost, $50,000.

Port Arthur, Ont.

The Riley-Ramsay Co., Ltd., wholesale grocers, will erect a 3-storey reinforced concrete warehouse this season at the corner of Water street and Cameron, 60 x 140. C. Wirth, Fort William, architect; estimated cost, $40,000.

The council have ratified the agreement with J. L. MacRae for construction of a hardwood finishing plant to cost not less than $60,00.

Quebec, Que.

Mr. R. P. Lemay, architect, has prepared plans for the new building to be erected by the Dominion Fish and Fruit Co., on St. Peter street. The new building, which will be constructed in stone, will be ten storeys high.

Regina, Sask.

Plans have been drawn for warehouse for Thos. Wilkinson, about $15,000.

The Farmers' Fence & Steel Wire Company, capitalized at $100,000, will build at once a factory and warehouse here. J. M. Stowe, president and general manager. This firm will employ about 150 men.

Steelton, Ont.

The charcoal plant of the Standard Chemical Iron & Lumber Company was destroyed by fire last week.

St. John, N.B.

The Crosby Molasses Company will erect a warehouse, 250 feet long by 110 feet. N. Brodie, architect.

Shawinigan Falls, Que.

The Belgo Canadian Pulp & Paper Company will erect an addition to their plant and install another paper machine.

St. Boniface, Man.

The Martin-Senour Paint Company connected with the Winnipeg Paint and Glass Company, will erect a new factory to cost about [illegible]. Contracts are stated to have been let.

Shawville, Que.

A company to be known as the New Hotel Co., Ltd., will erect a modern temperance hotel here.

St. John, N.B.

Manchester, Robertson, Allison, Ltd., will add to their plant [illegible] be erected on Prince William street. The plans are being prepared by G. Ernest Fairweather, but nothing in the way of details will be given out until the return from Europe of James F. Robertson of the firm.

Toronto, Ont.
It is stated that the Canadian Northern Railway has purchased the entire block bounded by King east, Church, Court and Toronto streets, and will erect on that block a magnificent building taking the form of a big hotel and railway office combined.

Vancouver, B.C.
The Hudson Bay Company have purchased additional property adjoining present site for extensions to their store.

Wood, Vallance & Leggat Company will erect a brick and steel warehouse costing about $300,000. The site has been secured.

Wakefield, Que.
J. P. Morgan is the architect in charge of the erection of the flour mill here for Mr. Alexander Maclaren. Work will be commenced the last of June.

Woodstock, Ont.
The Bain Wagon Company will extend their plant.

AWARDED

Chatham, Ont.
Wells & Gray, Limited, have been awarded the contract for erection of reinforced concrete warehouse here for the International Harvester Co. here, $60,000.

Medicine Hat, Alta.
The contract for erection of store for T. Hutchinson has been let to J. L. Peard, $12,000.

The contract for the Bank of Montreal, Toronto street and South Railway street, has been awarded to Fulton & Worthy, of this city, $15,000. This building will consist of pressed brick and stone trimmings. Architects, Hutchinson, Bates & Balten, Calgary.

Montreal, Que.
The contract for the extension to the Windsor Street Station of the C. P. R. consisting of concrete boiler house and elevated tracks, has been awarded to Messrs. Byers & Anglin. The sum involved will be about $175,000. Work will be commenced on this contract at once.

Ottawa, Ont.
The contract for the iron stairs for the Blackburn building have been awarded to the Canada Foundry Company. W. E. Noffke, architect.

Regina, Sask.
The contract has been let for the new Imperial Bank to be erected at the corner of Scarth street and 11th avenue to the McKay Construction Company. Work will start at once. Estimated cost, $55,000.

St. Catharines, Ont.
F. C. Hitch & Co., of Montreal, are reported to have secured the contract to erect the plant here for the Steel & Radiation Co., Ltd., comprising six buildings, all brick, surfaced with concrete, and include a foundry, 120 x 200 feet; machinery and pattern shops; cost, approximately $125,000.

Wallaceburg, Ont.
McNairnie Bros., Wallaceburg, have been awarded the contract for the erection of Dupont Hotel. Estimated cost, $20,000. Concrete foundation, brick, two storeys high, with cement trimmings.

Winnipeg, Man.
John McQuarrie has been awarded the contract for the building of a garage on garry street.

Permits granted to Mortgage Company of Canada, for office building on Garry street, $72,000; contractors, Kelly, Simpson Construction; architects, Pratt & Ross; also to the Consolidated Plate Glass Company for warehouse between Portage & Ellice, $40,000. J. D. Atchison, architect; J. W. & H. P. Fred, contractors.

Wakefield, Que.
The Dominion Bridge Company has been awarded the contract for the steel work of Alex. McLaren's elevator and flour mill at Wakefield. J. P. McLaren, architect.

Power Plants, Electricity and Telephones

Calgary, Alta.
There is to be an addition of three more car tracks added to the east side of the present car barns. Supe intendent McCauley will have plans prepared at once.

Tenders addressed to city commissioners, will be received until May 26th for supply of three K.V.A. single-phase transformers and switchboard. W. D. Spence, city clerk.

Jonquiere, P.Q.
Penstocks, water wheels, generators, etc., required for Price Bros. Co.'s new pulp mills here will be purchased at an estimated cost of $300,000. R. S. Kelsch, consulting engineer.

London, Ont.
The city is considering the placing of 200 more lights, City Engineer Wright; Superintendent Glaubitz.

Millbrook, Ont.
The Seymour power by-law was carried. Work on the new sub-station will be commenced at once.

Moncton, N.B.
Another big gas well has been struck by the Maritime Oilfields Company at a depth of about 1,570 feet. Under test it shows four million feet of gas a day. Mr. O. P. Boggs, manager.

Montreal, Que.
A new power house and lanudry for the Windsor Hotel here will be erected. The power house will have a capacity of 800 h.p. R. S. Kelsch, consulting engineer.

Magog, Que.
The Dominion Textile Company has retained the services of R. S. Kelsch in connection with the new power plant to be built jointly by the town and the above company. This plant will be used for supplying light and power to the town, all surplus being consumed at the mills of the Dominion Textile Company. T. Pringle & Son, represent the town.

Ottawa, Ont.
Conduits for the Ottawa Electric Co., G. N. W. and civic electric department will probably be laid under the sidewalks on either side of Sparks street from Bank to the canal and under the Plaza Laurier and along Rideau street to Little Sussex. Separate conduits will be provided for the low and high tension wires, G. N. W. wires carry a voltage of 250 volts, while the Ottawa Electric carry 2,500 volts. Mayor Hopewell; W. J. Duckworth, G.N.W.; A. A. Dion, Ottawa Electric Company.

Port Arthur, Ont.
No tenders were received for material for street railway track on account of short time for delivery. Tenders closed May 4th.

Pincher Creek, Alta.
A recommendation has been sent to council to report on the feasibility of securing a site on the lower end of the south fork canyon for the development of electrical power.

Prince Albert, Sask.
Tenders are called until June 13th for construction of dam and headworks and canal and power station foundations for this city. Advertisement in "Tenders and For Sale Department" of this issue.

Stettler, Alta.
The by-law to erect an electric power and lighting plant was carried. The power plant, providing for 2,500 16 c.p. lights, will be erected at once.

Shawinigan Falls, Que.
The Shawinigan Water & Power Co. will continue the work on the new power building during the summer. Tenders may be asked for the installation of a 10,000 h.p. dynamo and corresponding turbine.

Winnipeg, Man.
Different offers of various companies to construct a street railway, etc., for Springfield, are being considered.

Plans submitted by the Winnipeg Electric Railway Company for a double track line on Mountain avenue to McPhillips street, with the necessary connections at Main street, were approved, the electrical construction to be satisfactory to the city electrician.

Miscellaneous

Calgary, Alta.
Contract was awarded quite recently to Messrs. Phillips, Lang & Co., of Chicago, for coal and ash handling machinery and coal bunkers for No. 2 municipal power house to be erected in Victoria Park. Contract price, $42,300.

The following bids were opened for street paving: People Municipal & Highway Paving Company, bitumized concrete, $1.87 sq. yd.; Crown Paving Co., asphalt, 4-in. concrete base, $2.27 sq. yd.; Forest City Paving Co., concrete, No. 1, $2.30; No. 2, $2.35; Kettle River Quarries Co., wood block, 3½-in. blocks, $3.65, $3.75; 3-in. blocks, $3.47, $3.67; Bitulithic & Contracting Ltd., on concrete base, 5-in., $2.75; 6-in. base, $2.85; bituminous base, $2.45; R. S. Blonce Co., granitoid, $2.65; Calgary Paving Co., 4-in. concrete base, $2.25; 5-in. base, $2.45; bituminous base, $2.15.

London, Ont.
Tenders are called until May 25th for supply of scarifier and hose. G. W. Wright, city engineer. Advertisement in

"Tender and For Sale Department" of this issue.

Ottawa, Ont.

Tenders were received for a 40 horse power boiler for the Dowe's Lake drainage scheme. They were Canada Machine Company, $760; Jenckes Machine Company, Sherbrooke, $800; E. Leonard & Sons, London, $778; Canada Foundry Company, $950; P. J. Powers, Ottawa, $858. These were referred to the city engineer to report on.

Tenders are called until May 30th by the Public Works Department for sorting cases for post offices. Plans, etc., on application to T. A. Hastings, clerk of works, postal station "F," Toronto, and at the above department. R. C. Desrochers, secretary.

Seaforth, Ont.

Tenders are called until May 27th for construction of steel bridge, etc., over the River Maitland, about seven miles from here. James Campbell, clerk of Hullett, Londesboro. Advertisement in "Tenders and For Sale Department" of this issue.

South Vancouver, B.C.

At a total cost of $1,250, it was decided to purchase five Badger chemical engines, this order to include the one now at Collingwood, with which the others are to be identical, and to be delivered within thirty days.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman, board of control, will be received until Ma y22nd for construction of permanent sea wall along a portion of the cribwork in front of Exhibition Park. Specifications at office of the Parks Department, City Hall.

AWARDED

Montreal, Que.

The Bishop Construction Co., Ltd., Montreal and Toronto, have been awarded the contract for the building for the Verral Storage Company. Messrs. Wragge & Fox, architects. Contract price, $60,000.

Unclassified Items

Calgary, Alta.

Tenders closed on the 18th inst. for a bungalow for C. P. R. dining and sleeping car crews. Cost, $3,000.

Contract for substructure of bridge on Elbow river was let to Mr. Fehrenback, for $20,402. The Algoma Steel Bridge Co., Winnipeg, will erect the superstructure at a cost of $31,800.

Second street east bridge has two spans of 150 ft. each and 12th avenue one span of 150 feet.

Paving of the bridges wi llbe called for after erection.

Edmonton, Alta.

The contract for clearing line of the C. N. R. from Onoway, on Lac Ste. Anne, 30 miles west of Edmonton, in a northwesterly direction toward the Athabasca river, has been let by the Northern Construction Company to the contractors White & Tobin. They will commence work on the contract immediately.

Goderich, Ont.

Engineer Roberts is making new surveys and planning sewer in south end of town.

The Kensington Furniture Factory will likely re-build that part of factory destroyed by fire, at an estimated cost of about $40,000.

A new building for the Marine and General Hospital is being contemplated, to cost about $15,000.

Seaforth, Ont.

This municipality is considering plans for a Carnegie library to cost about $10,000.

South Vancouver, B.C.

The following contracts for waterworks supplies were awarded: Robertson, Godson Company, to supply 300 four-inch gtae valves at $6.15 each; Canadian Fairbanks Company, 200 six-inch gate valves at $8.30 each; Vancouver Engineering Company, 20 tons of cast iron specials at $3.20 per 100 pounds; Robertson, Godson Company, brass fittings, $1,680.25, and galvanized fittings, $153.72, both as specified; Canadian Fairbanks Company, galvanized iron pipe, $5.86 for twenty miles of one-inch; $4.07 for twenty miles of three-quarter-inch; $3.12 for forty-five miles of hafl-inch; all per 100-foot length. Owing to the early delivery promised by Evans, Coleman & Evans, that firm was awarded the contract for supplying forty-two miles of four-inch steel pipe at $28.17 per 100 feet, and eight miles of six-inch pipe at $40.36 per 100 feet. After a long discussion on the tenders for 300 hydrants the matter was referred back to the waterworks committee. There is a difference amounting to almost $3,000 between the prices offered by local and those of eastern firms.

St. John, N.B.

Tenders are called until May 23rd for construction of sewerage system of Fairville drainage eastward by way of North street; also construction of sewerage system draining westward into septic tanks. Plans, etc., at office of the city engineer, G. G. Murdock. J. King Kelley, county secretary, 108 Prince William street.

Victoria, B.C.

Tenders for the construction of the proposed causeway at Coal Harbor, B.C., will be called for, to be in June 2 next. The estimated cost of the bridge is approximately $120,000.

Winnipeg, Man.

It is announced here that five new immigration halls are to be constructed in Saskatchewan and Alberta, a large one at Calgary will cost $35,000 and another at Gravelbourg about $5,000. The others will be located at Kerr Robert, Tisdale and Castor, and will cost from $3,000 to $4,000 each. In addition detention houses are to be built by railway companies at Emerson Junction, Emerson and North Portal.

Supplementary Estimates

Among the supplementary government estimates for the year ending March 1914 are the following: Halifax, N.S., docks and wharfs at $600,000; Moncton, N.S., addition to general office building, further amount required, $45,000; Mulgrave, N.S., improvements at $30,000; Truro, N.S., to increase accommodation at, further amount required, $12,800; towards the construction of a railway from a point on the Intercolonial Railway at or near New Glasgow in the county of Pictou, (or from Sunny Brae in the said county, in event of the branch line of railway to that place being acquired, as it may be under this appropriation) to the town of Guysboro, and from the said line of railway at Cross Roads Country Harbor to the deep water of the said harbor, $1,000,000; towards the construction of a railway from a point on the Intercolonial Railway at or near Dartmouth in the County of Halifax via Musquodoboit Harbor and the valley of the Musquodoboit to Dean Settlement in the said county, $1,000,000; towards the construction of a railway from a point on the Intercolonial Railway, at or near Alba in the County of Inverness to the town of Beddeck in the County of Victoria, $200,000; Aspy Bay, North Harbor, N.S., protected entrance channel atDingwall, $50,000; Prince Edward Island Railway, branch line, O'Leary to Wes tPoint, $50,000; branch line from Kensington to Stanley Bridge via Long River and Clifton, $100,000. Hudson Bay Railway, construction, $2,000,000. Welland Ship Canal, to complete survey, $50,000. Quebec Bridge, refund of subsidy paid by the Province of Quebec, $250,000, and city of Quebec, $300,000, to the Quebec Bridge and Railway Co., for a highway and railway bridge, $550,000; Lachine Canal, bridge at Rockfield, $80,000; Murray Canal, electrical equipment, $9,500; Rideau Canal, towards construction of bridge over Rideau Canal at Bank street, Ottawa, $80,000; St. John, N.B., new post office, $75,000; Montreal, Que., new ordnance depot, $50,000; Montreal new customs examining warehouse, $100,000; Montreal Postal Station "A," St. James street, $30,000; Quebec post office, enlargement, $40,000; Quebec Citadel, quarters for married N.C.O's and men, $50,000; Quebec, ordnance stores, foot of Palace Hill, $50,000; Stanstead Plain, Que., post office and armory, $10,000; Kingston, Ont., R.M.C., additional dormitory accommodation for cadets, further amount required, $45,000; Ottawa, Ont., explosives testing station, buildings and equipment, $50,000; Ottawa Old Museum Building, Sussex street, alterations, etc., $25,000; Calgary, Alta., new post office building, $75,000; North Vancouver, B.C., public building, $50,000; Chatham, N.B., new wharf, $100,000; Gaspe, Que., deep water wharf, $75,000; Three Rivers Harbor, Que., completion of deep water wharf at west end of harbor, $115,000; Burlington Beach Canal, Ont., deepening and widening, $100,000; Goderich, Ont., harbor improvements, further amount required, $116,000; Kingston, Ont., harbor improvements, $50,000; Owen Sound, Ont., harbor improvements, $25,000; Peterborough, Ont., wharf, $20,000; Sarnia Bay, Ont., improvements, $50,000; Toronto, Ont., harbor improvements, $30,000; Windsor, Ont., landing dock, $30,000; Red River, Man., St. Andrews Dam, construction of approaches, $63,000; Fraser River, B.C., to commence construction of training pier, $200,000; Powell River Harbor, B.C., to take over breakwater and complete same, $55,000; British Columbia, dredging, further amount resuired, $11,000; Maritime Provinces, dredging, further amount required, $200,000; Ontario and Quebec, dredging, further amount required, $200,000; Ontario and Quebec, dredging, [illegible] Island, [illegible], British Columbia, new dredge,

(Continued on page [illegible])

Tenders and For Sale Department

To Contractors

Sealed tenders addressed to either of the undersigned will be received until noon on Saturday the 20th instant, for building concrete abutments and concrete floor for the Club Bridge over Black Creek on the town line between Moore and Sombra. Plans and specifications may be seen at the residence of J. T. Whitside, Courtright, or at the residence of Neil McGugan, Wilkesport, or at the office of Bell & McCubbin, Engineers, St. Thomas. A marked cheque must accompany tender as specified. The lowest or any tender not necessarily accepted. The committee will open tenders in the Village of Sombra on Monday, 22nd instant, at 3 o'clock p.m.

NEIL McGUGAN,
Wilkesport, Ont.
J. T. WHITSIDE,
Courtright, Ont.
19-20

CITY OF MOOSE JAW
Saskatchewan

Incinerator Plant

Sealed proposals endorsed "Incinerator Plant" will be received by the City of Moose Jaw addressed to the undersigned City Clerk until 8.30 o'clock p.m., on **Monday, 22nd May, 1911.**

The proposals received may cover alternative designs and methods but in any case the plant shall be capable of handling 25 tons per day and provision made for generation of steam.

The price bid shall include the supply of all materials for and the complete construction of the plant, same to be turned over to the Corporation in satisfactory working order.

Satisfactory guarantees shall accompany each tender.

The lowest or any thender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.
Moose Jaw, April 24th, 1911. 18-20.

City of Toronto

Tenders for the Construction of Turner's Bath Bridge

Tenders will be received by registered post only, addressed to the chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on **Tuesday, 30th May, 1911**, for the construction of a steel and concrete bridge at Turner's Baths, Hanlan's Point, Toronto Island.

Envelopes containing tender must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained upon application to the Department of Railways, Bridges and Docks, City Engineer's Office, Toronto.

The lowest or any tender not neecssarily accepted.

G. R. GEARY, Mayor,
Chairman of Board of Control.
City Hall, Toronto, May 6, 1911. 19-20

Steam Shovels

We own and have for sale near Buffalo, N.Y., two Vulcan 75-ton 2½-yard steam shovels; late model, with new extra large boilers and in excellent condition; also one 70-ton. These will stand most rigid inspection and we are offering them at unusually low prices. Confer with us.

WILLIS SHAW MACHINERY CO.,
39 So. La Salle Street,
Chicago, Ill.

CITY OF MOOSE JAW
Saskatchewan

Storm Sewer Extensions

Sealed tenders endorsed "Contract 32 or 33" will be received by the City of Moose Jaw addressed to the undersigned City Clerk until 8.30 p.m. on **Monday, May 22nd, 1911.**

Any tender received after the above stated time will be declared informal.

Contract 32.—The laying of approximately 9,000 lineal feet of Storm Sewer and 2,300 lineal feet of Catch basin connections and builidng manholes, catch basins, etc.

Plans and specifications may be seen at the City Engineer's office.

Contract 33.—The supply of approximately: 7,900 lineal feet of 10-in. Vitrified Tile Pipe; 1,100 lineal feet of 8-in. Vitrified Tile Pipe; 2,300 lineal feet of 6-in. Vitrified Tile Pipe, also junctions, bends, etc.

Specifications may be obtained from the City Engineer's Office upon application.

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.
Moose Jaw, April 29th, 1911.

For Sale or Exchange

Municipal Pumping Plant
Deseronto, Ontario

Tenders will be received by the undersigned up to noon of **June 4th, 1911**, by the Corporation of the Town of Deseronto, for the sale of the following equipment:

One 75 h.p. Fairbanks-Morse Suction Gas Producer.

One 65 h.p. Fairbanks-Morse Vertical Producer Gas Engine.

One 12 x 15 Triplex Pump, direct connected by friction clutch to Gas Engine, capacity 1,000 gallons per minute.

The above equipment has only been operated a short time and is in first-class condition. Changing to hydro-electric power necessitates disposing of above equipment. Plant is offered complete as above or separately, or would consider an exchange for equal capacity rotary pump and motor.

Specifications and dscription of above equipment furnished on application to the undersigned or can be seen at the offices of the Contract Record, B34 Board of Trade Building, Montreal, and 441 Seymour street, Vancouver, B.C.; or at the office of the Canadian Engineer, 62 Church street, Toronto, or 404 Builders' Exchange, Winnipeg.

LUCIUS E. ALLEN,
Consulting Engineer,
Belleville, Ont.
18-20

Tenders Wanted

Tenders for repairing and enlarging the Tank of the Niagara Waterworks System according to plans and specifications which may be seen or had by applying to the undersigned or to F. W. Paulin, C.E., Niagara Falls, Ont., will be received to 8 p.m., **Tuesday, May 23rd, 1911.**

Envelopes must be sealed, and marked "Tenders for Repairing and Enlarging Tank."

The Council do not bind themselves to accept the lowest or any tender.

W. E. LYALL,
Clerk.
Niagara-on-the-Lake,
May 5th, 1911.
19-20

Tenders
For
Bridge Piers and Abutments

Tenders will be received at the office of the City Commissioners up till 3 p.m., **May 29th, 1911**, for the construction of the Piers and Abutments for bridge over the Saskatchewan River. Plans and specifications may be seen and all information obtained at the office of the City Engineer. Lowest or any tender not necessarily accepted.

CITY COMMISSIONERS,
A. J. LATORNELL, City Engineer.
Edmonton, April 29th, 1911. 19-20

Sealed tenders addressed to the undersigned and endorsed "Tender for Public Building, Seaforth, Ontario," will be received until 4 p.m., on **Monday, May 29, 1911**, for the construction of a Public Building at Seaforth, Ont.

Plans, specifications and form of contract can be seen and forms of tender obtained at the office of Mr. H. J. Lamb, District Engineer, London, Ont., at the post office, Seaforth, and at this Department.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation, and place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, payable to the order of the Honorable the Minister of Public Works, equal to ten per cent. (10 p.c.) of the amount of the tender, which will be forfeited if the person tendering decline to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,
R. C. DESROCHERS,
Secretary.
Department of Public Works,
Ottawa, May 1, 1911.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department.
19-20

Contractors' Material

90 Austin 6-yd. two-way Dump Cars, 4 ft. 8½-in. gauge.
Davenport 10 x 16 Dinkey, Standard gauge.
Baldwin 16 x 24 American type locomotive, 4 ft. 8½ in.
Bucyrus 55-ton Steam Shovel, built 1903.
Marion A. A. Steam Shovel, built 1903.
Six Wheel Scrapers.
Two Lidgerwood Cableways, complete.

All of this material in Canada. No duty. Have you anything to sell? Write us.

THE MALES COMPANY,
82 Perin Bldg., Cincinnati, O.

Tenders

Toronto General Hospital

Tenders addressed to the Chairman of the Building Committee will be received by the undersigned up till noon **Saturday, May 27th, 1911**, for all the trades required in the erection and completion of a Servants' Building for the Toronto General Hospital.

Plans and specifications and all other information can be obtained at the office of the architects,

DARLING & PEARSON,
2 Leader Lane.

The lowest or any tender not necessarily accepted. 20-20

City of Prince Albert

TENDERS

Sealed tenders addressed to the City Commissioners will be received until noon on **Wednesday, the 31st day of May, 1911**, for the following:—

(a) Extensions to Water and Sewerage Systems:
- 12-in. Cast Iron Sewage Pumping Main, 2,365 lin. ft.
- 10-in. Cast Iron Water Main, 2,966 lin. ft.
- 8-in. Cast Iron Water Main, 1,034 lin. ft.
- 6-in. Cast Iron Water Main, 8,798 lin. ft.
- 24-in. Storm Sewer (Vitrified Pipe) 1,300 lin. ft.
- 18-in. Storm Sewer (Vitrified Pipe) 1,650 lin. ft.
- 8-in. Storm Sewer (Vitrified Pipe) 928 lin ft.
- 12-in. Sanitary Sewer (Vitrified Pipe) 3,580 lin. ft.
- 10-in. Sanitary Sewer (Vitrified Pipe) 440 lin. ft.
- 8-in. Sanitary Sewer (Vitrified Pipe) 7,648 lin. ft.
- Manholes, 35.
- Catch basins, 28.

(b) Construction of Concrete Sewage Pumping Station No. 2.

(c) Supplying and erection of two Electrically driven Centrifugal Sewage Pumps and Motors.

Plans and specifications (see (a) and (b)) may be seen at the office of the City Engineer. Sec. (c) will be forwarded on application and will be on file at the office of Canadian Engineer, Builders' Exchange, Winnipeg, after May 15th.

Marked cheque payable to Secretary-Treasurer of the City of Prince Albert must accompany each tender as follows:

Section (a)- $2,000.
Section (b)—$200.
Section (c) $200.

The lowest or any tender not necessarily accepted.

ANDREW HOLMES, Mayor.
C. O. DAVIDSON, Secretary-Treasurer.
F. A. CREIGHTON, City Engineer.
CITY COMMISSIONERS

Dated at Prince Albert, Sask.
May 8th, 1911

TENDERS for HEATING

Sealed tenders for steam heating of Victoria Hall, in Cobourg, Ont., addressed to the County Clerk, Cobourg, will be received up to noon on **Thursday, June 1st next**, marked "Tenders for Heating." Plans and specifications can be seen at the office of the County Clerk, Cobourg.

GEORGE GREER,
Chairman of Committee

Cobourg, April 13, 1911. 20-20

Tenders Wanted

Bulk and separate tenders for all or any of the several branches required in the erection and completion of a Baptist Church Building to be erected in St. George, Brant County, Ont., will be received up to noon, **Thursday, June 1st, 1911.**

All tenders shall be sealed and marked "Tender," and addressed to Dr. Patten, St. George, Ont.

The plans and specifications may be seen upon application to Dr. Patten or at the office of Taylor & Taylor, architects, Hope Chambers, Brantford, Ont.

The lowest or any tender not necessarily accepted.

Brantford, Ont., May 15, 1911. 20-20

YORK COUNTY

Tenders

For

Concrete Bridge Abutments

Tenders will be received by the undersigned up to twelve o'clock noon, **Tuesday, May 30th, 1911**, for the construction of Concrete Abutments for a bridge over a branch of the Humber River, on the Townline between the Townships of Vaughan and York, in the 4th Concession of the Township of York, in the County of York.

Plans and specifications may be seen and all necessary information may be obtained at the offices of the undersigned, 57 Adelaide street east, Toronto.

The lowest or any tender not necessarily accepted.

BARBER & YOUNG,
York County Engineers.

Toronto, May 16th, 1911. 20-20

CITY OF MOOSE JAW

Saskatchewan

Paving and Sidewalks

Sealed tenders endorsed "Contract 34 or 35," will be received by the City of Moose Jaw addressed to the undersigned City Clerk until 8.30 p.m. on **Monday, May 29th, 1911**.

Any tender received after the above stated time will be declared informal.

Contract 34.—The laying of approximately 41, [illegible] square yards of pavement.

Contract 35.—The laying of approximately [illegible] 001 square feet of concrete sidewalks and 46,306 lineal feet of curb and gutter, also 1,056 square yards of Wood Block Crossing.

Specifications may be obtained from the City Engineer [illegible] upon application.

The lowest or any tender not necessarily accepted.

J. M. WILSON, W. F. HEAL
City Engineer. City Clerk.

Moose Jaw, May 4, 1911 [illegible]

CITY OF LONDON, ONT.

Tenders

For Scarifier and Hose

Sealed proposals addressed to the "Chairman and Members No. 2 Committee," will be received at the office of the City Clerk until 5 p.m. on **Thursday, May 25th, 1911**, for 500 ft. 2½-in. 6 ply, rubber lined sewer hose, complete with couplings, also for a road scarifier.

Bids to state price f.o.b. London, Ont.

The city reserves the right to reject any or all bids and to accept any bid.

NEIL COOPER, GEO. W. WRIGHT,
Chairman No. 2 Committee. City Engineer.

Dated, May 12th, 1911. 20-20

TO CONTRACTORS

Tenders will be received by the undersigned up to the **27th of May, 1911**, at 12 o'clock noon, for the repair of the Perche Drain in the Township of Sarnia, by dredging.

Plans and specifications can be seen at the Clerk's office, H. D. Kewley, Sarnia Township.

The lowest or any tender not necessarily accepted.

A marked cheque for $500, payable to my order, must accompany each tender as security that contract will be executed, if tender accepted. Successful tenderer must give satisfactory security for the performance of contract.

The work extends over a distance of about 2,029 rods.

ROBT. BEATTIE, Reeve,
Sarnia P.O.

May 2nd, 1911. 20-20

Street Paving

Sealed tenders marked "Tenders for Paving," will be received by the undersigned up to 12 o'clock noon of **Monday, May 29th**, for paving in the Town of Waterloo. Tenders are invited for various kinds of pavements.

Patent pavement tenders are to be accompanied by full specifications.

Pavements to be constructed approximately 13,500 square yards.

Marked cheque for five per cent. of amount of tender must accompany each bid.

The lowest or any tender not necessarily accepted.

FORD S. KUMPF,
Town Clerk

Waterloo, May 12, 1911. 20-21

Tenders

For

Waterworks Supplies, Etc., Ridgetown, Ont.

Sealed tenders addressed to the Town Clerk will be received up to **Thursday, the 1st day of June, inclusive, 1911**, at 8 o'clock p.m., for Waterworks supplies and labor as follows:

Approximately 2,600 ft. of 8 inch, 6,400 ft. of 6-inch and 3,700 ft. of 4-inch cast iron water pipe, [illegible] valves, etc. All excavating, etc., laying and covering pipe. One steel elevated tank.

[illegible] plans and specifications may be seen at the office of either of the undersigned.

Lowest or any tender not necessarily accepted.

[illegible] Consulting Engineer,
[illegible] Building,
London, Ont.

[illegible] Town Clerk,
[illegible] Ridgetown, Ont.

Tenders Wanted

Tenders will be received by the Council of the Township of Hullett up till 2 p.m. on **Saturday, the 27th of May**, for the building of a steel bridge 100 feet, between abutments, 16 ft. roadway with cement floor on the River Maitland, about 7 miles north of Seaforth. Also for the building of cement abutments to support said bridge. And also for the building of one cement abutment at Wallace's Bridge near Summerhill in said Township.

The lowest or any tender not necessarily accepted.

Specifications for the cement work can be seen at the Clerk's Office.

JAMES CAMPBELL,
Clerk Tp. Hullett,
Londesboro P.O.

20-21

Corporation of Collingwood

Sealed tenders will be received by registered mail addressed to K. S. Macdonell, Town Engineer, until 4.00 p.m. **31st May, 1911**, for the construction of all-concrete sidewalks to be laid by the Corporation during the year 1911. Approximately 40,350 sq. ft. to be laid at once.

An accepted bank cheque drawn in favor of the Town Treasurer, for the sum of two hundred dollars, must accompany each tender, same to be forfeited to Corporation on failure of successful tenderer to sign contract.

Specifications may be seen at the office of the Engineer after **16th May, 1911.** Tenders to be plainly marked "Sidewalk Tender."

The lowest or any tender not necessarily accepted.

K. S. MACDONNELL,
Town Engineer.

Collingwood, Ont.,
May 12th, 1911. 20-21

City of Prince Albert

Tenders for

POWER WORKS

Sealed tenders will be received until 8 p.m., Tuesday, June 13th, 1911, by the Corporation of the City of Prince Albert, Province of Saskatchewan, for the construction of Dam and Headworks and Canal and Power Station Foundations, being portions of the proposed Hydro-Electric Power Development, on the North Saskatchewan River, at La Colle Falls, (distant 25 miles east of the city).

Tenders are invited on each separately, and must be plainly marked on the outside of envelopes, and addressed to the Secretary-Treasurer, City of Prince Albert, Saskatchewan.

Each tender must be accompanied by an accepted bank cheque, for $5,000, payable to the Secretary-Treasurer, which cheque will be returned to the bidder, unless he fail to execute a contract, should it be awarded to him.

The successful bidder, on each of the works, will be required to execute a Bond, in the sum of $40,000, for the faithful performance of the contract.

The City reserves the right to reject any or all tenders.

The plans and specifications will be on file, and may be seen on and after **May 23rd, 1911**, at the City Hall, Prince Albert; office of "Canadian Engineer" at Winnipeg; office of "Canadian Engineer," Montreal, or at the offices of the Engineers, C. H. & P. H. Mitchell, Traders Bank Building, Toronto, Ont.

ANDREW HOLMES, Mayor.
C. O. DAVIDSON, Secretary-Treasurer.

Prince Albert, Sask.,
May 9th, 1911. 20-22

Sand Dredge for Sale at a Sacrifice

Hydraulic Sand Dredge in excellent condition, complete with necessary pumps, engines, boiler, "A" frame, spud cutter, etc.

Accessories include 500 feet of steel discharge pipe, of which 250 feet is fitted with flexible joints; also seven pontoons to carry same.

For further information and details, apply to the City Engineer of Hamilton, Canada.

Hamilton, Canada, May 15, 1911. 20-20

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

POSITION WANTED—As Superintendent or walking boss on railroad or other construction work, by experienced man who can furnish excellent references. Apply Box 271, Contract Record, Toronto, Ont.

Positions Vacant

WANTED—Foreman to take charge of sewer construction work where steam shovel is used for excavation. State salary expected and give experience and references. Apply Box 273, Contract Record, Toronto, Ont. 20-20

Wanted—At once, an experienced draughtsman. Give references and state salary expected. Taylor & Taylor, architects, Hope Chambers, Brantford, Ont. 20-20

WANTED

Assistant City Engineer for City of Hamilton, Ontario, salary $2,000 per year, applicant to submit credentials showing experience and qualifications in municipal engineering to the undersigned on or before May 18th, 1911.

S. H. KENT,
City Clerk.

Hamilton, May 10th, 1911. 20-20

Business Chances

There is an opening in Goderich, Ont., for a planing mill.

Humboldt, Sask.

We are informed that there is an opening for a brick manufacturing plant in Humboldt and also a first class machine shop.

Supplementary Estimates

(Continued from page 57)

plant, further amiunt required, $200,000; Manitoba, new dredging plant, further amount required, $35,000; Ottawa City Bridges, extension of Sappers' and Dufferin bridges, further amount required, $180,000.

New Companies

The Sherbrooke Land & Water Power Co., Ltd., Sherbrooke, Que, capital, $50,000, incorporated. Incorporators, Rennie Ogilvie McMurtry, advocate; Francis Bush, bookkeeper, and George Robert Drennan, both of Montreal, Que.

The Telephone City Oil and Gas Co., Ltd., Brantford, Ont., capital, $25,000, incorporated. Incorporators, John Bechtel Detwiler and William Houlding Whitaker, manufacturers; David Zealand Gibson, gentleman; David Stewart Gibson, coal merchant; all of Brantford.

Canadian Arrowsmith Manufacturing Co., Ltd., Toronto, Ont., capital, $50,000, incorporated. Incorporators James Wilson Arrowsmith, manufacturer, and Willis Renville Sanders, salesman, both of Morristown, N.J.; Joseph Beekman Saums, Chicago, Illy., salesman; George Washington Hopping, Morris Plains, N.J.

United Bradd & Lead, Ltd., Toronto, Ont., capital, $500,000, incorporated. Incorporators, Alexander Frederick Falls, Chatham, Ont., chartered accountant; Frederick Somerville, and Murray James Woodbridge.

The Lennoxville Light & Power Co., Ltd., Lennoxville, Que., incorporated, capital, $20,000. Incorporators, Messrs. Sydney Lee Spafford, gentleman, Lennoxville; Arthur Lucius Spafford, Capelton, Jacob Nicol, advocate, Sherbrooke.

Toronto Lumber Company, Limited, Toronto, capital, $40,000, incorporated. Incorporators: H. B. Bishopric, merchant; T. B. Scott, merchant, both of Toronto.

The Baden Lumber and Manufacturing Company, Limited, Baden, Ont., incorporated, capital, $20,000. Incorporators, D. G. Steinmann and Henry Ratz, laborers, both of Baden.

Edwards Electrical Company, Limited, Toronto, incorporated, capital, $250,000. Incorporators, D. Henderson and W. H. McGuire, barristers, both of Toronto.

Clements Road-builder and Ditcher Co., Ltd., Winnipeg, Man., incorporated, capital, $100,000. Incorporators, C. H. Clements, B. Clements, both of Winnipeg.

The Rishton Construction Company, Winnipeg, Man., incorporated, capital, $40,000. Incorporators, J. Robinson, merchant, and B. L. Beacon, barrister, both of Winnipeg.

Thibodeau's Gas & Oil Co., Three Rivers, Que., incorporated, capital, $20,000. Incorporators, J. D. Thibodeau, gentleman; J. Bureau, advocate, both of Three Rivers.

San Antonio Land and Irrigation Co., Ltd., Toronto, capital $8,000,000, incorporated. Incorporators, James Stellar Lovell, accountant, and Wm. Bain, bookkeeper, both of Toronto.

Z. O. Limoges, Ltd., Montreal, capital $100,000, incorporated to manufacture, produce, buy and sell lime, cement, asphalt, etc. Incorporators, Z. O. Limoges, lime-burner, and Alfred Lacroix, both of Montreal.

Gloucester Galent Zinc Mines, Ltd., Montreal, capital $180,000, incorporated. Incorporators, J. F. McKenzie and H. J. Murphy, brokers, both of Montreal.

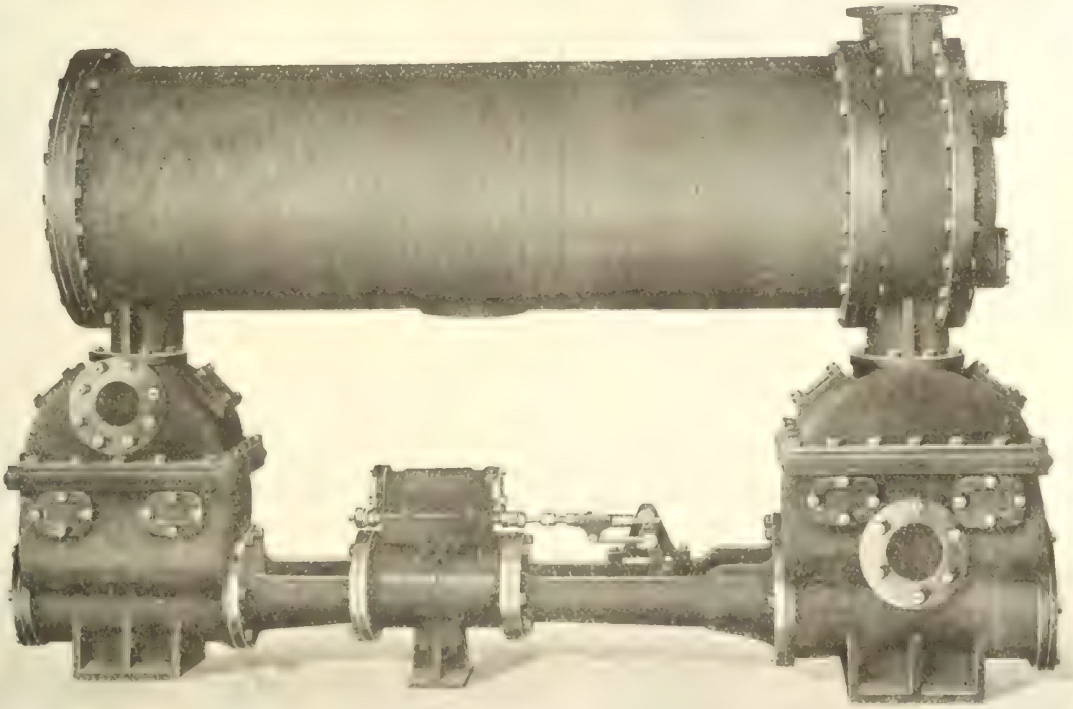
Dominion Architectural Ironworks, Ltd., Montreal, capital $100,000, incorporated. Incorporators, Gilbert Humphreys, manufacturer, and J. R. Estey, engineer, both of Montreal.

Upper Fraser River (British Columbia) Lumber Co., Ltd., Montreal, capital $2,500,000, incorporated. Incorporators, F. G. Bush, bookkeeper, and G. R. Drennan, stenographer, both of Montreal.

Dominion Industrial Co., Ltd., Montreal, capital $2,000,000, incorporated. Incorporators, T. C. Casgraine, King's counsel, and A. C. Casgraine, both of Montreal.

The Grand Metis Power Co., Ltd., Montreal, capital $100,000, incorporated. Incorporators, W. J. Shaughnessy, advocate, T. S. Owens, student, both of Montreal.

Condensors



Condensers built by The John Inglis Co., Limited

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

Let us Submit Prices.

The John Inglis Company
Limited
Engineers and Boilermakers
14 Strachan Ave., TORONTO, Canada

BUILDERS

Residence of Rev. Potter, Dundas, Ont. Architect, Martin H. Hewett. Frontage, 30 feet depth, 40 feet. Six rooms. Cost complete, $2,600. Ideal blocks used.

Concrete is The Building Material of Today

AND

"IDEAL" FACE DOWN

CONCRETE BLOCK MACHINES

are the only Machines embodying the Face Down, horizontal core, principal that can be made solid in Canada.

10 years in the market and famous for their reliability.

As a practical builder, you of course want the machine that will give you the best blocks—the greatest variety of faces and the greatest nnmber of perfect blocks at smallest cost. Write for "Ideal" catalogues.

IDEAL CONCRETE MACHINERY CO., LIMITED
Dept. C.R., - London, Ont.

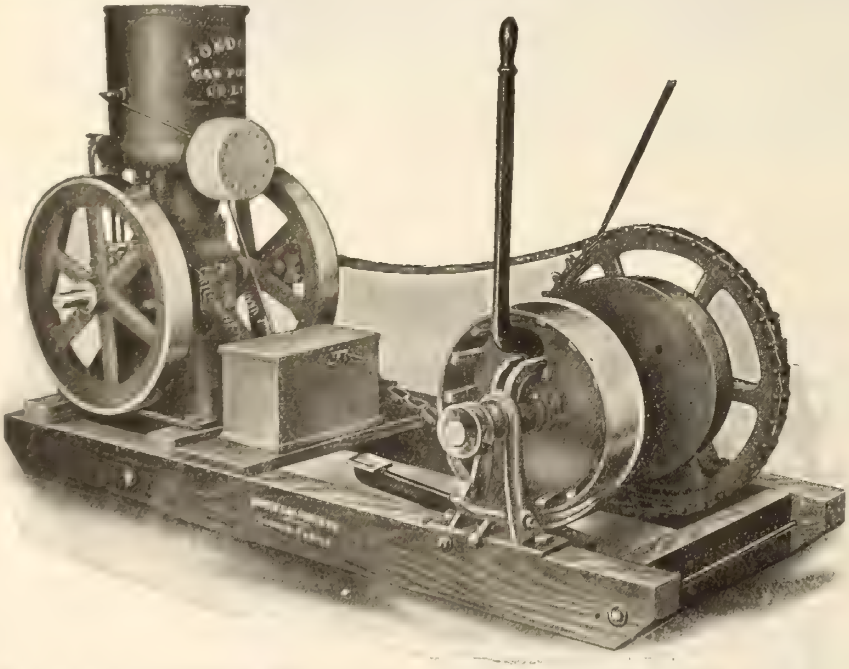
Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDER'S GAZETTE
VANCOUVER
Builders' Supplies
JOHN GUNN & SONS
Contractors' Machinery
FOR SALE
H. W. PETRIE
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg



Complete 5 H. P. Hoisting Outfit, Operating Side

Here is a Hoisting Outfit that Has Saved Money Let it Save Yours

A **"London"** self contained engine mounted on the strong bolted frame with our famous **"London" Friction Clutch Hoist** with ball bearing thrust, will give you an outfit hard to beat.

The gearing consists of sprockets and heavy malleable iron chain.

Send for our Literature which contains complete description of the above outfit.

The London Gas Power Company Limited, London, Canada
ENGINEERS and MACHINISTS

SELL WATER BY MEASURE!

Water works systems, every summer, are strained to overcome—waste!

Why not treat water as merchandise, just as you treat gas and electricity?

The Venturi Meter will register gallons of water on an ordinary meter dial.

It consists of a Venturi Tube and a register connected by two pressure pipes.

The Tube is part of the pipe line and cannot be injured by water hammer or disarranged by foreign substances.

Bulletin No. 56 describing 20 years experience in the use of the Venturi Meter will interest every engineer.

Water works, large and small, power and manufacturing plants, filtration and irrigation systems testify to its value.

There is no limit to its size. A 9-foot meter has been proved to work as satisfactorily as a 1-inch meter.

The Venturi Meter will detect the "slip" in pumps, that is the discrepancy between the water actually pumped and the water expected by computation.

The John McDougall Caledonian Iron Works Co., Limited, 512 William St. Montreal, are the sole agents for Canada.

USE THE VENTURI METER

WATER - POWER PLANTS
LOW PRESSURE TURBINES

ANY OUTPUT

ESCHER WYSS & CO.

Water Power Engineers

Works: Zurich, Switzerland

CANADIAN OFFICE:

Toronto: Lumsden Bldg., R. 408

Cablegrams: Neumuehle, Toronto Phone Adelaide 234, Toronto

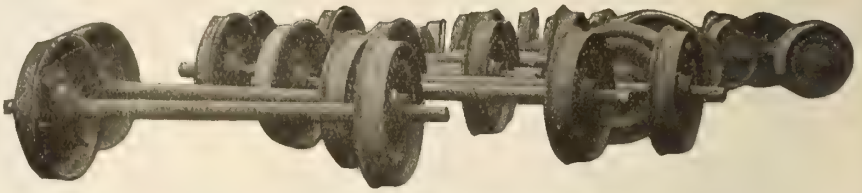
RAILWAY CONSTRUCTION PLANT

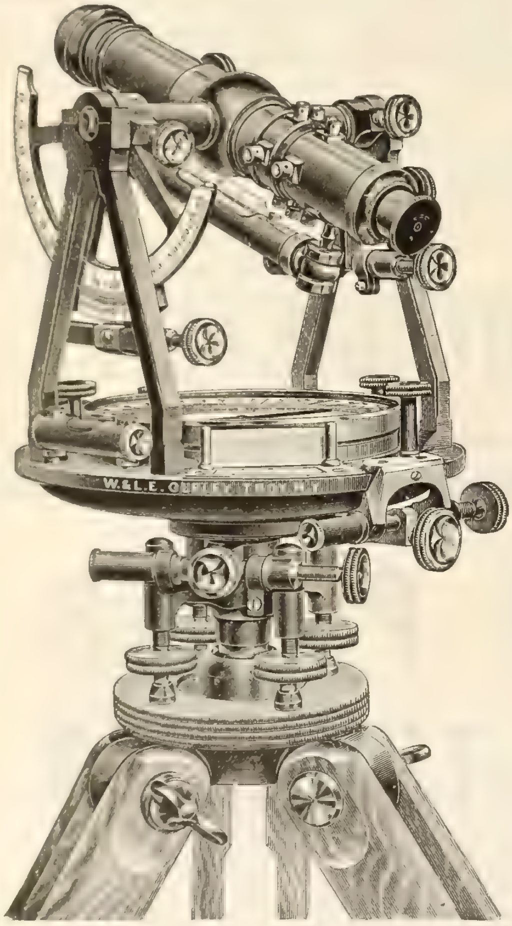
Hoisting Engines, Horse Powers, Hand Winches, Derricks, Car Wheels, Axles and Boxes, Dump Cars, Rail Cars, Buckets

MARSH & HENTHORN, Limited
Makers of Hoisting Machinery, BELLEVILLE, ONT.

Send for Catalogue

SALES AGENTS
MUSSENS
LIMITED
Montreal, Que.





1845 1911

W. & L. E. Gurley
TROY, N. Y.

Largest Manufacturers in America of
Field Instruments
for Civil, Mining and Hydraulic
Engineers and Land Surveyors

Transits
Y Levels
Compasses
Plane Tables
Current Meters
Levelling Rods
Chains
Tape Lines

Also Makers of
Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

Dundas Stone

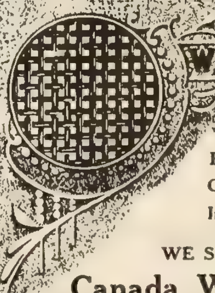
All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario



ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES
Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.

Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

WRITE FOR FORM CATALOGUE
ENGINE CATALOGUE FOR THE ASKING
COMMISSIONER'S TIME BOOK FREE

Concrete Form & Engine Co.
Successor to Collapsible Steel Form Co.
83 Congress St., W., Detroit, Mich.

"Nothing is impossible to pains and patience, but it takes the best material to insure complete satisfaction."
—The Philosopher of Metal Town.

"METALLIC"

Rock Faced and Brick Siding

when in place cannot be distinguished from genuine brick or stone.

An economical, ornamental and durable siding for small houses, automobile garages, office and store fronts, etc.

"Manitoba" Steel Siding

for Elevators, Mills, Storehouses and Factories.

Made from the best quality galvanized or painted sheet steel; it is FIREPROOF and DURABLE, and presents a very neat appearance.

For further information, send for our new catalogue No. 70. Interesting information on Metallic Building Materials.

Manufacturers

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

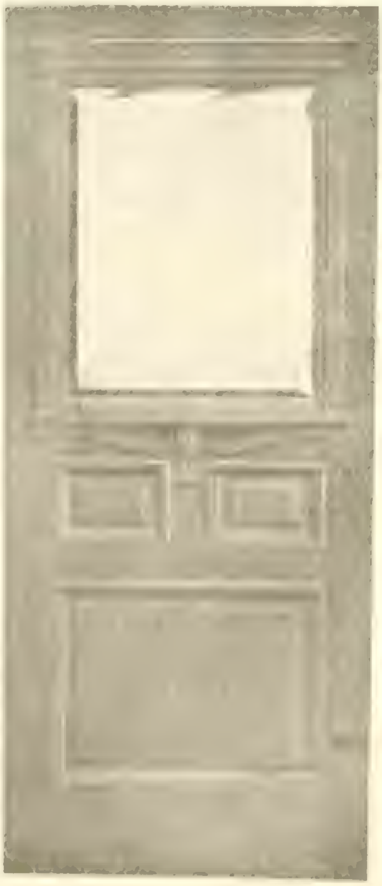
Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City



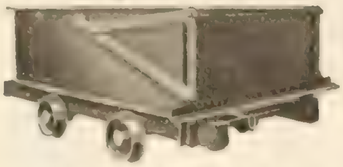
BRYAN DOORS

Noted for their Beauty and Durability

[illegible]

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario

INDUSTRIAL - CONTRACTORS - EQUIPMENT

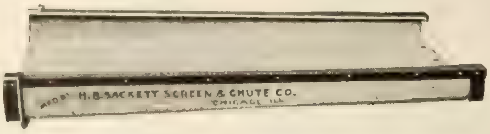


Lifting gate End Dump Car

We make these any guage, any size, style and number.

High Quality
Low Prices
Quick Shipments

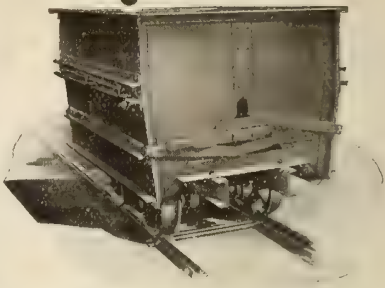
We make chutes of all kinds. For chuting concrete—coal—sand—anything.



Write for our Catalog No. 31-A

We make a specialty of Heavy Sheet Steel work.

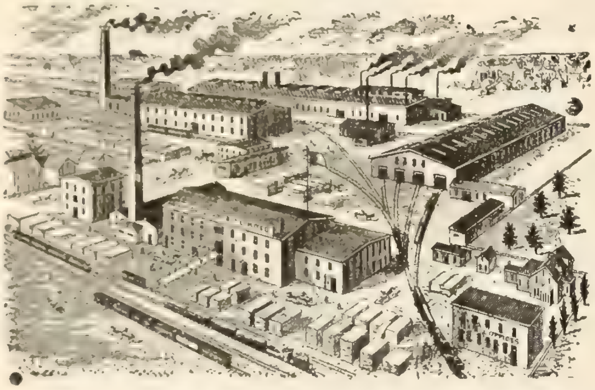
SACKETT - CHICAGO



Gable bottom car; all sizes

1691 Elston Ave., Chicago, Ill.

Rhodes, Curry Co., Limited
Lessees



Bank and Office Fittings
SCHOOL DESKS A SPECIALTY

We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc.

In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

Rhodes, Curry Co., Ltd. Amherst, N. S.
BRANCHES AT
Halifax Sydney

Do You Think

that you can Afford

to pass us by before getting our prices on your requirements or before putting in your tenders on

Plate Sheet Fancy
or any kind of
Glazing Glass

The
Consolidated Plate Glass Co.
of Canada, Limited

TORONTO MONTREAL WINNIPEG

Fred Holmes, President C. P. Holmes, Sec'y-Treas.

Telephone North 663

Fred Holmes & Sons
Limited
Building Contractors

1113 Yonge St., Toronto

BUILDERS SUPPLIES

WATER
WASHED
SAND
OUR SPECIALTY

Dealers in
Sand and Gravel
Crushed Granite
Crushed Stone

SAND
&
SUPPLIES, LTD.
TORONTO

DOORS

Pine and Veneered Hardwood

Midland Brand

Our stock of Doors is most complete, all we want is your order. We are prepared to take care of any amount of business you may give us. Our doors are made to get business and to keep it.

Will you send us your next order?

Georgian Bay Shook Mills, Limited

MIDLAND, ONTARIO

Ritchie Contracting & Supply Co.,

Limited

7th Floor Bower Building, 543 Granville Street,
VANCOUVER, B.C.

Manufacturers and Dealers in Building Materials and Contractors' Supplies

We carry in stock **Ransome Concrete Mixers** and parts.

Agents For:—**Hart-Ottis Convertable Cars**
Davenport Locomotives
McCully Rock Crushers
Marion Steam Shovels
The Dominion Wire Rope

Write, phone, or call for prices and catalogues.

Our aim, prompt delivery.

Note tremendous metal weight on this floor. Entire building of Alsen's Cement, reinforced concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

PURE WATER

It is easy to obtain with our plants and apparatus

We design and contract for complete municipal filtration plants of any capacity.

We supply and install apparatus for sterilizing water supplies by the application of calcium hypochlorite.

Literature, Sketches, Estimates and Recommendations Supplied on Request

American Water Softener Co.
1001 Chestnut St., PHILADELPHIA, Pa.

We have no affiliations or working acquirements with any of our competitors.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

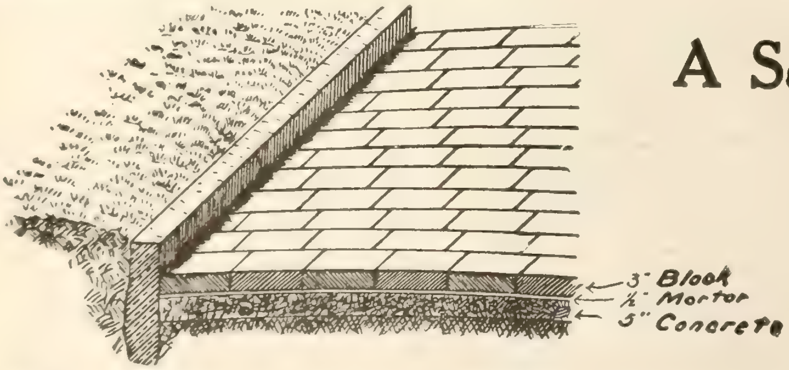
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

THOS. & WM. SMITH, LD.,

WIRE ROPE MANUFACTURERS,

NEWCASTLE-ON-TYNE, ENGLAND.

ELECTRIC CABLEWAY OVER THE ZAMBESI RIVER AT THE VICTORIA FALLS.
Span, 870 feet. Working Load, 10 tons. [illegible] Breaking Strain of Main Cable, [illegible] tons.
Main Cable supplied by Thos. & Wm. Smith Ltd., Newcastle-on-Tyne.

HIGH-CLASS WIRE ROPES

For CONTRACTORS' WORK, such as BLONDINS CRANES, INCLINES, BALLAST ROPES,
&c., &c., and all classes of work requiring Wire Ropes

AGENTS IN CANADA
EVANS, COLEMAN & EVANS, Ltd., Vancouver. ANGEL ENGINEERING & SUPPLY CO. Ltd., St. John's, N.F.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg. BAINES & PECKOVER, Toronto.

REPRESENTATIVE FOR CANADA
D. W. CLARK, P.O. Box 521 TORONTO, ONTARIO.

USE ONLY SMITH'S "RED THREAD" WIRE ROPES.

Do You Build on 'Spec'?

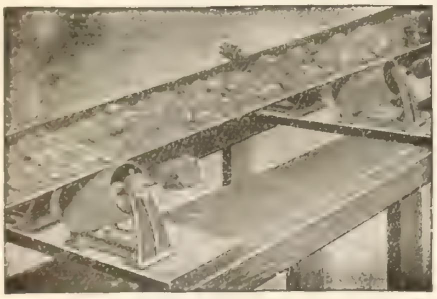
Houses and stores sell better, and rent quicker, when ceiled with Preston Steel Ceilings. People don't like to live amid bare walls for the year that must usually elapse before plaster dries.

Preston Steel Ceilings are not only beautiful in themselves, but the most practical ceiling for the speculative builder. For they can be painted as soon as they are installed, and that alone helps sell or rent any property. Moreover, they are fireproof—which lessens the insurance rate : and sanitary—which no plaster ceiling ever can be. Dampness does not effect them. Yet they are economical.

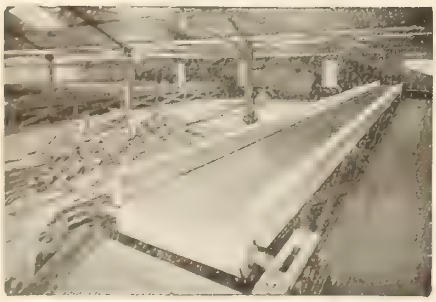
Nothing equals a Preston Steel Ceiling for rented property. For, once in place, they need no repairs and will outlast the building itself. Choose from over 1,100 most modern designs. Send for handsomely illustrated book of designs, and trade price list.

PRESTON STEEL CEILINGS
HELP TO SELL HOUSES

The Metal Shingle & Siding Co.
Limited
Preston, Ontario
Branch Office and Factory - MONTREAL



Scandinavia Belting



The Ideal Conveyor Belt
Good in wet and dry places

Federal Engineering & Supplies, Limited
284 Yonge Street, Toronto
329 St. James St., Montreal

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 1000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U.S.A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

The Smith Marble and Construction Co., Ltd.

Montreal

Office & Factory:
145 Van Horn Ave.

Show Rooms:
458 Blury Street

Importers,
Manufacturers,
Contractors

OF

Interior and Exterior Marble, Slate, Floor and Wall Tiles, Mosaics, Plumbers and Electrical Marble, Granites for Building and Monumental Work.

The Contractor's "Money Saver"

Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

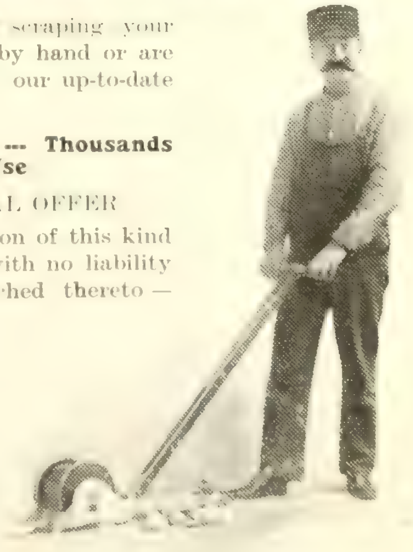
No Experiment --- Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto—write us

to-day.

MACHINE PAYS FOR ITSELF IN A FEW DAYS.



"Little Giant Floor Scraper"

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

The Carey Roof Standard
CAREY'S FLEXIBLE CEMENT ROOFING

TO PROVE TO YOU the high standardized construction and composition of Carey's Roofing, we want to send you Booklet and Samples FREE, and give you practical information regarding Carey's Roofing, based on 25 years' actual time-proved tests. Carey's Roofing is equally adapted to flat or steep surfaces, wood sheathing, tile or concrete. Whether your contract is large or small, we want to show you the advantages of using a standardized roofing material. The Philip Carey Mfg. Co., [illegible] Wayne Ave., Cincinnati, O. 30 Branches.

"FAMOUS FOR DURABILITY"

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President [illegible]
[illegible]

Robert W. Hunt & Co. Limited
Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, CANADIAN EXPRESS BLDG., MONTREAL, QUE.
[illegible]
[illegible]

Perfection Wire Mesh

is a **continuous** concrete reinforcement. Even transverse continuity is secured without lap. Hooks attach the adjacent strips together.

Did you ever stop to consider the cost of the lapped portions of non-continuous reinforcement? Or the consequence of too much economy in this direction?

For spans up to eight feet there is no better reinforcement than **Perfection Wire Mesh.**

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

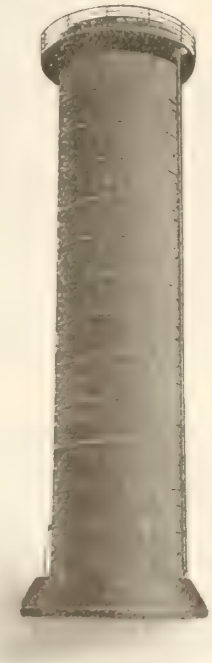
"Hammer Brand"
Hard Wall Plaster

HARD-WALL PLASTER HAMMER TRADE MARK BRAND HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Works Destroyed by Fire — Now Rebuilding



STAND PIPES and Elevated Tanks

Highway Bridge and Concrete Work.

Boilers of all kinds.

Steel Piling.

Over a quarter of a century's experience in the manufacture of these lines.

Get our figures before closing your contracts

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

Business Insurance

How is business built up and reputation acquired? Every Architect and Contractor must answer that question in the most practical way.

The degree of **his** success **depends** altogether on **the service rendered** and the **goods specified** or **recommended.**

There's no escaping **that** conclusion.

Naturally, we believe **International Varnish Products** are the best of their class you **can** specify or recommend.

Prejudiced we may be, but we have logical reasons for the faith that is in us.

You see we have been manufacturing varnishes, enamels, stains and finishes for over forty years

We have worked hard and spent money like water to perfect our products.

And **many** prominent Architects and Contractors **declare** that **we have succeeded splendidly.**

We do not ask you to take our word.

Send us your name and address and we'll mail you a nickle steel bound book that actually shows things

When you specify or recommend International Products you practically take out a policy insuring success. The quality of the goods is known and—

International Products are always sold in Full Imperial Measure Cans.

International Varnish Co., Limited
TORONTO WINNIPEG

for Highest Efficiency, Absolute Reliability, Greatest Economy

Used by the Largest Mining Companies and Hydro-Electric Plants.
Also Extensively for Dredging, Exhaust Steam, Compressed Air, etc.

Sizes 3 to 42″ Diameter up to ¼″ in thickness
Easily installed and securely connected with our Forged Steel Flanges or All Steel Bolted Joints.

Write for our Catalogue A and prices on your requirement

AMERICAN SPIRAL PIPE WORKS - MAIN OFFICE CHICAGO
NEW YORK OFFICE 50 Church Street

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction. This bucket gave complete satisfaction.

(Extract from letter referring to above.)
"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."
W. S. Downing, (Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.
1032 Garfield Building, CLEVELAND, OHIO
SELLING AGENTS
The Dominion Equipment & Supply Co., Winnipeg, Canada

Specify

Guelph Hydrated Lime

You will save dollars if you use this brand in place of ordinary lime.

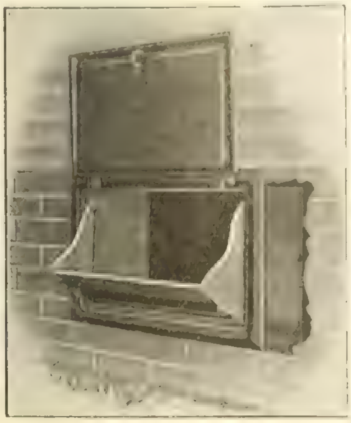
It's less trouble
Costs Less
Goes Further
Works easier
More convenient

And a hundred other reasons that you can discover by using it.

Specify **Guelph Hydrated Lime** when ordering from your dealer.

Standard White Lime Co.

Guelph - Ontario



EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

[illegible]

The Down Draft Furnace Co., Limited

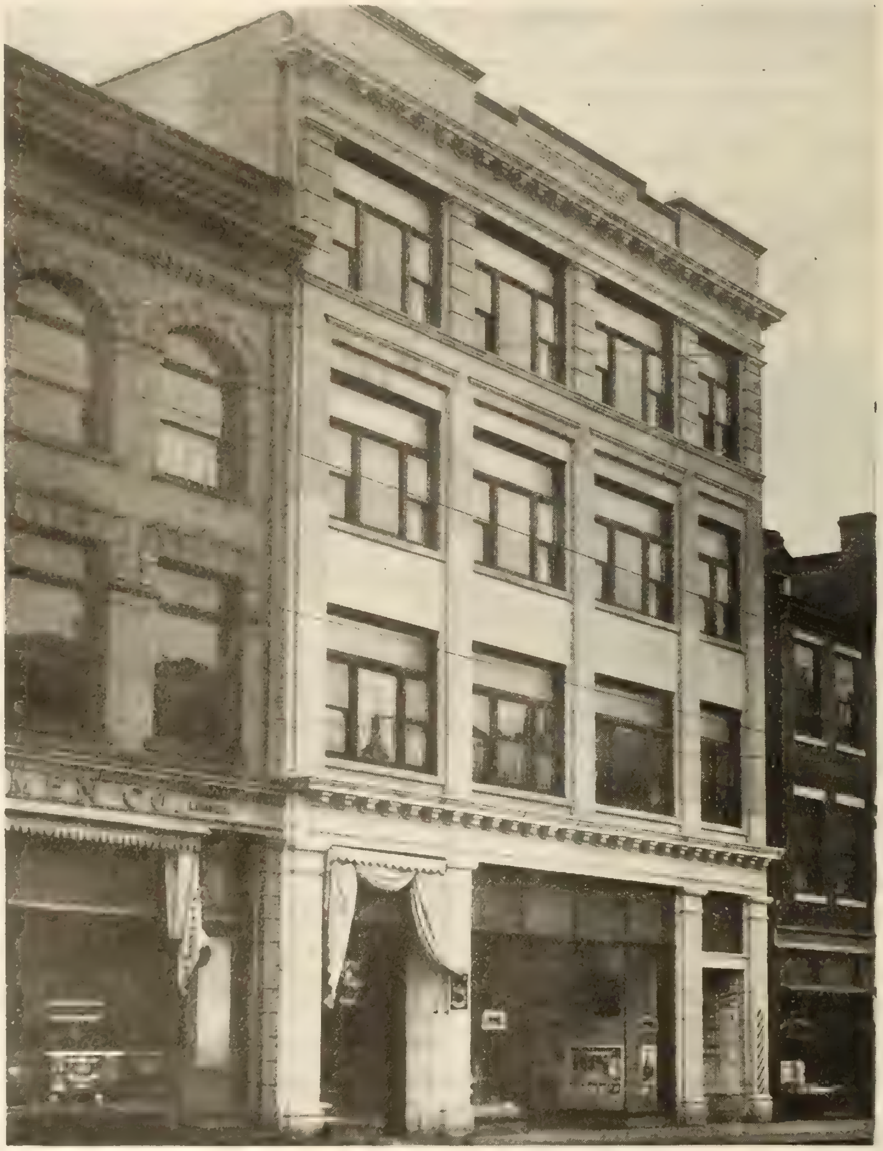
Galt, Ontario, Can.

CORINTHIAN STONE

was used in this building as well as for two others for the same proprietor. Why!

Because it was the Best

The same reason applies to others.



Any Size

Any Shape

Any Quantity

Send us your Plans for Prices

Weber Chambers, King Street, Berlin—Architect, Chas. E. Cowan, Esq., Berlin

Erected 1910 by the I. S. K. WEBER CO., LIMITED, BERLIN

All the Stone for above building supplied by

The Corinthian Stone Co.

OFFICE AND WORK:
G. T. R. JUNCTION, GUELPH, ONTARIO

IRON STAIRS

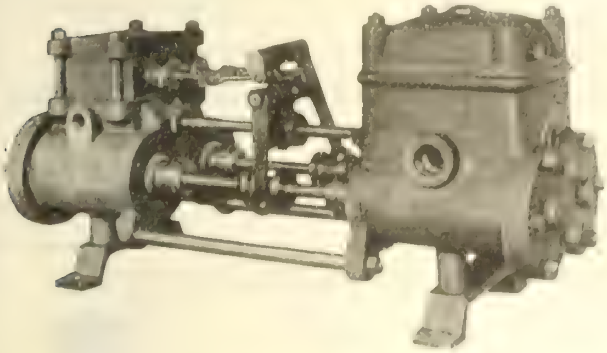
Dennis Wire & Iron Works Co.
London, Canada Limited
Toronto Offices - 12 QUEEN STREET E.

Cut shows a four wheel steam Locomotive Crane with 40ft. boom handling forms on New York Catskill Aqueduct at Valhalla, N.Y. These contractors are finding our cranes indispensable in this work, as they can be used for so many purposes; such as handling loose materials as broken stone, sand, concrete, etc., heavy timbers, rails, concrete forms, etc.

THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND, OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City

Pumping Machinery

We manufacture a large line of pumping machinery for special and general service.

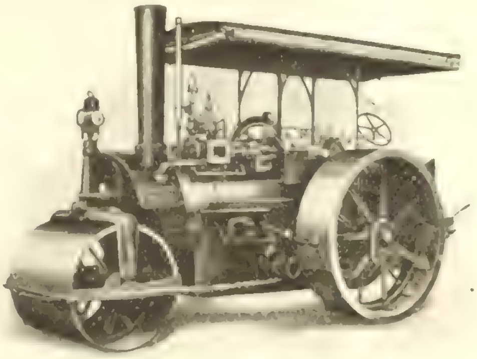


The above illustrates the Martin Standard Duplex Pump for boiler feeding and general service. They are specially designed for work where the requirements do not exceed a working pressure of 150 pounds per square inch.

Send for catalogue of our Pumping Machinery.

Martin Pump & Machine Co.
imited
Toronto, Canada

"A Canadian Roller
for Canadian Roads"



THE WATEROUS
DOUBLE CYLINDER
STEAM ROLLER

is built essentially to suit Canadian road building conditions. Over 100 Rollers in use in Canada to-day are proving their ability as road makers of the highest quality. A greater rolling capacity, with less cost of maintenance and operation, are its distinguishing characteristics. [illegible]

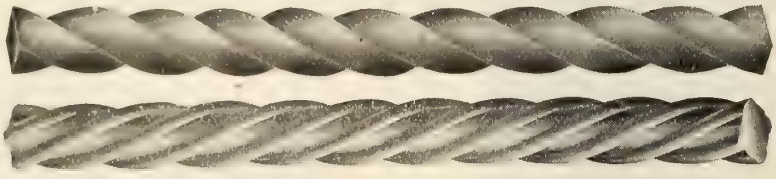
The Waterous Engine Works Co.
BRANTFORD, CANADA Limited
Agent Hugh Cameron & Co., 72 Queen St. E., Toronto, Ont.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N.Y. "Suburbs of Buffalo, N.Y."

Toronto Office
117 Home Life Building

Producers of the Celebrated

"Peerless"
Bedford Stone

Bedford Indiana Limestone

Mill Blocks
Sawed Planed and Turned Stone

W. McMILLAN & SON
(Incorporated)

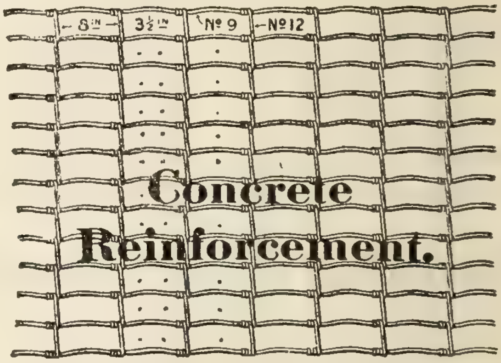
General Offices
Chamber of Commerce Building
CHICAGO, ILL.

Quarries and Mills { Bedford, Ind.
Bloomington, Ind.

Concrete Reinforcement

In 3½ ft. Rolled Units

Page Concrete Reinforcement with a 3½ x 8 mesh, and running wires of 2,200 lb. tensile strength is used on the Harbour Commission Elevator, Montreal, Soulanges Canal, etc. It replaced on the Chambly Dam reconstruction on the Richelieu, a reinforcing that failed, although of large reputaton. This is proof of its quality. It really reinforces concrete work under heavy stresses.



Put up in rolls for easy transportation. Running wires of high carbon steel, not bent or kinked, and of full strength. For adaptable and safe reinforcing of concrete, in dam, retaining wall, and bridge work, factory and foundation work, etc.

PARTICULARS, QUOTATIONS AND SAMPLE ON REQUEST.

Page Wire Fence Company, Limited
Walkerville, Ont.

Toronto Montreal St. John

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickess and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

Manufactured by
H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal

TENTS
for Engineers and Contractors

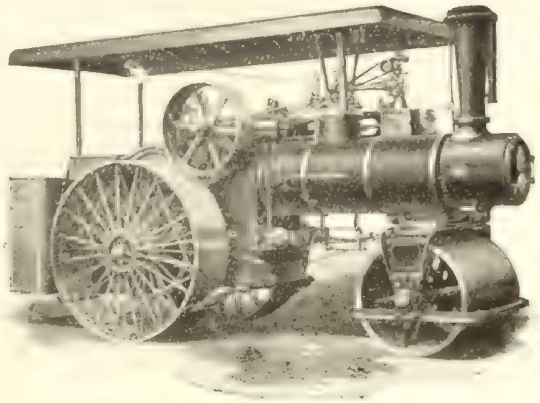
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

Woods Limited
Woods Building - Ottawa, Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.
Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT
THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18″ x 26″ cylinder Mogul, Standard Gauge, and 18-10″ x 14″ Vulcan and Davenport dinkeys, 36″ Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36″ Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8″ Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag-Scrapers an 4—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 21-56 lb. Frogs, 18-36″ Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW
May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. & Dolland Lane - - MONTREAL, CANADA

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North {664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C. P. R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

RECIPROCITY

means to exchange. We have high quality fittings, you have good money. Lets get together.

S BRAND

Cast Iron Fittings and Valves are Right

"Everlasting" Blow-off Valve
SIMPLE — DURABLE — EFFICIENT

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

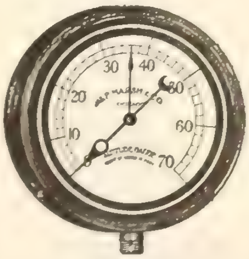
Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

MARSH GAUGES



FOR ALL PRESSURES AND PURPOSES
THE STANDARD FOR ALMOST HALF A CENTURY
PROMPT SHIPMENTS
WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

They Save Fuel

GLENBOIG GARTCOSH

GLENBOIG FIRE BRICKS

Made in the largest and most up-to-date brick plant in Europe, and used by the principal national arsenals as **FIRST QUALITY.**

They **LAST LONGER** than other makes and minimize repairs.

Stocks carried by all principal dealers

MAKER'S SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The
Missisquoi Marble Company
Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd.	Toronto, Ont.
C. N. Barclay	Winnipeg Man.
Bosse & Banks	Quebec, Que.
General Contractors Supply Company, Ltd.	Halifax, N. S.
129 Sparks Street	Ottawa, Ont.
James Robertson Co. Ltd.	St. John, N. B.
G. R. Duncan	Fort William, Ont.
Walker & Barnes	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd.	Vancouver, B. C.
315 Coristine Building	Montreal, Que.

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Limited

Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 **TORONTO**
Planing Mills, East Toronto - Phone Beach, 230

BUILDERS' SUPPLIES

Mouldings Turnings
"Empire Brand" Hardwood Flooring
Stair Building
Interior Trim
Sash
Veneered Doors
Pine Doors

J. R. Eaton & Sons
Limited
Orillia, Ontario

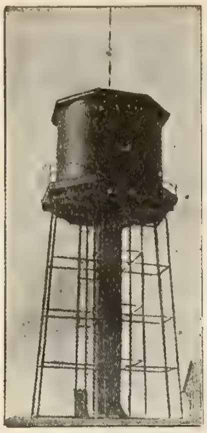
Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A.



Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

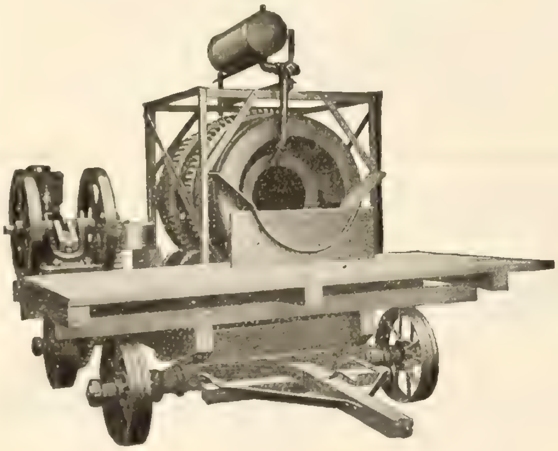
Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

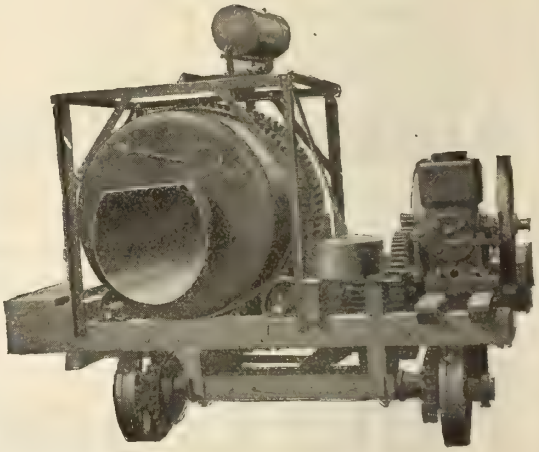
The Low Charging CROPP MIXER

The only Mixer that will not spill when overcharged

Low charge and high discharge covered by Patent 947196.

Either Steam or Gasoline Engine





Our Prices will Interest You

The only mixer having batch constantly in sight of operator.

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A.

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

THE
Thames Quarry Co.

St. Mary's, Ont.

CRUSHED STONE

Rubble, Coursing and Dressed Stone

Lime Stone for Flux

JOHN BONIS, Manager

Office Phone 110a Res. Phone 110b

Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING

LAND OR WATER

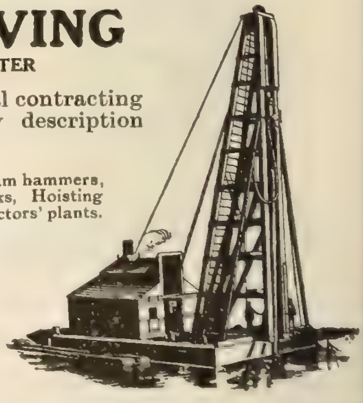
Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.

Office: 64 Niagara St.
St. Catharines, - Ont.



Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered t Toronto:—

	Per B.
o. 1 dry pressed red brick	$18.00
o. 1 dry pressed buff brick	18.00
ed Stock Bricks	12.00
rey Stock Bricks	11.00
Vire cut bricks for foundation work	11.00
orous terra cotta bricks	15.00
o. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, lamilton and London. These prices are f.o.b., vith 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
0 to 25 united inches	$4.25	$ 6.25
6 to 40 "	4.65	6.75
1 to 50 "	5.10	7.50
1 to 60 "	5.35	8.50
1 to 70 "	5.75	9.75
1 to 80 "	6.25	11.00
1 to 85 "	7.00	12.50
6 to 90 "	...	15.00
1 to 95 "	...	17.50
Brass Goods, Valves, etc.		
96 to 100 "	...	20.50
01 to 105 "	...	24.00
06 to 110 "	...	27.50

The following are wholesale prices for glass t Montreal and jobbing prices at Winnipeg for ox lots:—

	Single Mont'l.	Single W'p'g.	Double Mont'l.	Double W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	...	...	14.00	10.50
90 u. i.	...	...	16.50	11.50
95 u. i.	...	...	18.00	13.50
100 u. i.	...	...	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 80 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

ard compression work, 65 per cent.

n grade compression work, 60 per cent.

uller work, 70 per cent.; No. 0, 75 per cent., d 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 70 per cent.; roundway, 65 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4½ cents per lb.; traps and bends, 50 per cent

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 87½ per cent.

Cast iron fittings, 65; headers, 65; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 75 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.35; ⅜-inch, $1.40.

Binder stone, $1.35 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 40 cents per foot.

Rubble stone in car lots, $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered f.o.b. Toronto.

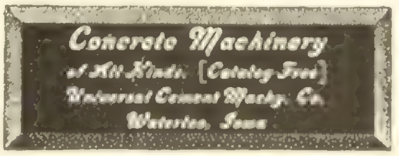
Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.

Lime, per cwt., delivered, 38 cents.

Plaster of Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.


Concrete Machinery
of All Kinds [Catalog Free]
Universal Cement Machy. Co.
Waterloo, Iowa

Rails for Contractors, Switches, Girders, etc. New and Second Hand

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Bonds of Suretyship [illegible]

Bonds Bid and Supply in lieu of Certified [illegible]

The

Guarantee Company of North America

[illegible]

Head Office - Montreal

[illegible]
Claims Paid over - - - $2,265,000

[illegible]

ARTIFICIAL STONE PAVEMENTS

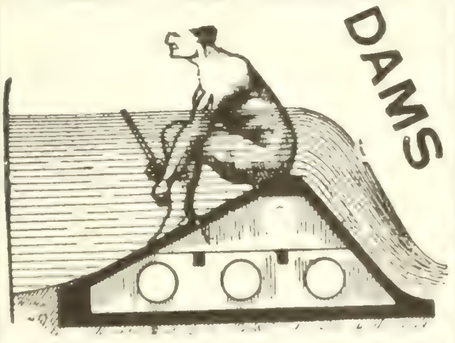
SIDEWALKS A SPECIALTY

CORPORATIONS will do well to consider our work and prices before letting contract

The Silica Barytic Stone Company of Ontario, Limited

WALTER MILLS
General Manager.

Head Office:
INGERSOLL, ONT.



AMBURSEN

Hydraulic Construction Co. of Canada, Limited.

450 Dorchester St. W. - MONTREAL, P.Q

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles,
Plates, Column Sections, etc.,
Always in Stock

Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greenaville - - Ont.

Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty

20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.

References Given

DOMINION BRIDGE CO.

LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.

Limited

Darlington, England

Bridges and Steel Structures

Canadian Offices:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

—Bridge and Construction Dep't.—

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

Terra-Cotta Fireproofing

Get an Estimate from

ROBERT BENNETT
Contractor
347½ Euclid Avenue, Toronto

☞ Over 25 years experience in U. S. and Canada

PHONE COLLEGE 4362

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

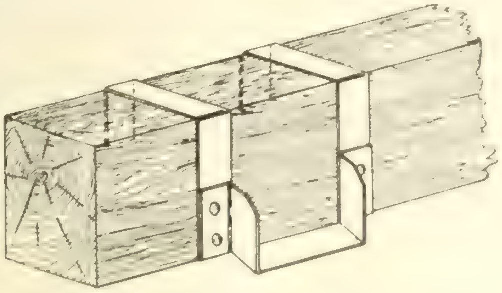
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

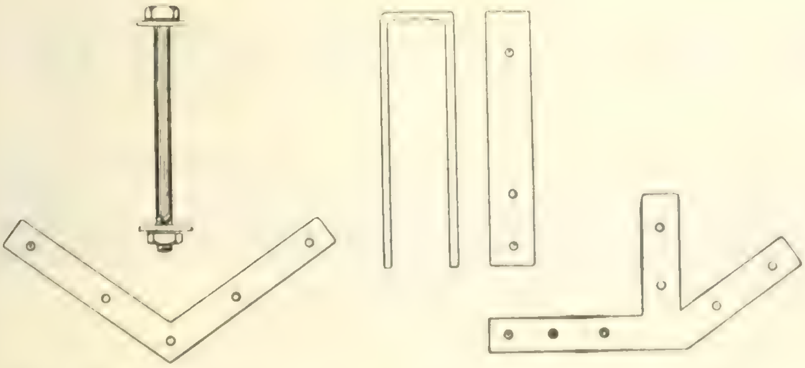
Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company, Ltd.

HAMILTON, ONT.



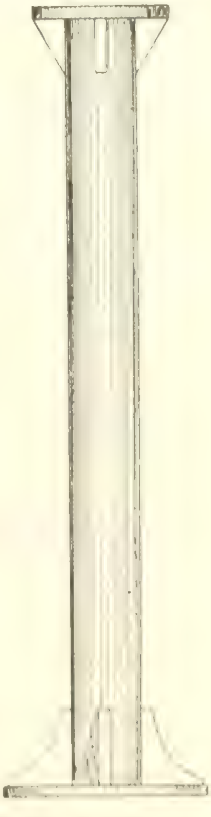
STEEL JOIST HANGERS, Single or Double



IRON FORGINGS, for Wooden Trusses, Apex Straps, Stirrups, Bolts and Rods made to order

Beams, Angles, Channels, Plates,

Any Size from 1½ inch to 24 inches, and any length up to 70 feet.



CAST IRON COLUMNS, all sizes and designs

S. S. SELMAN, President
A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President.
J. G. Allan Vice-President.
James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

PROMPT DELIVERIES

Fellowes and Fellowes

59 Yonge Street., TORONTO

Engineers' and Contractors' Machinery

Steel Dump Cars, Hoisting Engines, Derricks Pumps, new and second hand Rails and Cars, Turntables, Clam Shell and Orange Peel Buckets, etc. Contractors' Elevating and Conveying Machinery.

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridge's Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, **Toronto**

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, **Ottawa**

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulpand Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street East, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.

A.M. Can. Soc. C.E. A.M. Am. Soc. C.E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C.E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.

Consultations, Reports, Plans.

Suite 413, Pacific Block, **Vancouver, B. C.**

CONCRETE BARGES

SPECIFICATIONS AND PLANS OF

Reinforced Concrete Barges, Pontoons and Scows

PREPARED BY **James Taylor,**

CONSULTING AND INSPECTING ENGINEER,
MONTREAL

P.O. Box 95, Station B Enquiries Invited

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { **Waterworks, Sewerage and Electric Lighting.**

Toronto and Winnipeg

John Galt John Haddin

Allan Keefer

Architect

Ottawa, Ontario

Arthur L. Weeks

Architect

Canada Life Building, Ottawa

Reinforced concrete and steel structures, factories and commercial buildings

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. **Montreal**

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

THE FOUNDATION COMPANY
LIMITED
Bank of Ottawa Building - Montreal, Canada

RECENT CONTRACT

We make a Specialty of

Water Power Construction,
Power Plants, Dams

OUR SCOPE:

BRIDGE PIERS - DOCKS - DAMS - SEA WALLS - MINING SHAFTS
WHARVES - TUNNELS - WATER POWER CONSTRUCTION
HEAVY BUILDING FOUNDATIONS

OUR METHODS:

PNEUMATIC CAISSONS - OPEN CAISSONS - WOODEN AND STEEL SHEET PILING
CONCRETE PILES - WOODEN PILES - COFFER DAMS
CONCRETE STEEL CONSTRUCTION

We Invite Inquiries in Reference to Cost and Design of Difficult Foundation Work.

Victoria Ave., Westmount, Quebec. "The Modern Tarvia Pavement."

Send for New Booklet

We have recently issued a new and beautifully illustrated booklet, detailing the experience of many town authorities and road engineers with Tarvia.

It shows how in one case after another Tarvia was first tried on experimental strips, frequently in competition with other materials. Then after the experience of a year or so, all other dust layers and road binders were discarded and Tarvia was used more and more extensively.

Some engineers have adopted the broad policy of using Tarvia in all *new* macadam construction. Many road authorities go still further and aim to treat all the old macadam roadways with Tarvia to preserve them against the destructive effect of automobile traffic and prevent dust.

We want property owners to know that a dusty road is not merely a nuisance to them but is an endless burden upon them as taxpayers—because dust means that the macadam is pulverizing and the surface blowing away.

We want property owners to realize that the road authorities of their town can give them comparatively dustless macadam roads at little or no extra cost.

We want road engineers to realize that they can reduce their maintenance costs by bonding their roads with Tarvia, and that the saving in maintenance will generally pay for the Tarvia application.

We therefore urge everyone interested to send for our booklet to nearest office.

The Paterson Manufacturing Co. Limited
Montreal Toronto Winnipeg Vancouver
The Carritte-Paterson Manufacturing Co., Limited
St. Johns, N.B. - Halifax, N.S.

KAHN SYSTEM

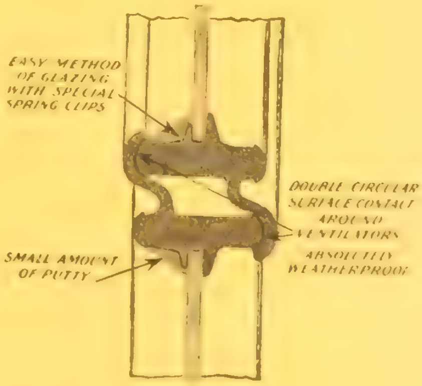
United Steel Sash

UNITED STEEL SASH are made of specially rolled steel sections, which are combined by powerful presses into sash of maximum strength, and attractive appearance. The muntins are deep and narrow, offering a minimum obstruction to the light. The joints are not weakened in any way by cutting or punching.

UNITED STEEL SASH are inexpensive and compare favorably in cost with unsatisfactory wooden sash, which are short-lived and inflamable. Ventilators of UNITED STEEL SASH extend the full width of each unit and are made absolutely weather proof around the openings by double circular contact joints. Special spring clips save labor in glazing and hold the glass firmly in place.

UNITED STEEL SASH are made in many standard types to meet all conditions of window opening. Size of glass, 10 to 14 inches in width, and 16 to 24 inches in height.

Write for **1911 UNITED STEEL SASH Catalogue,** giving full-sized details, tables, illustrations, etc., **Free.**


EASY METHOD OF GLAZING WITH SPECIAL SPRING CLIPS
DOUBLE CIRCULAR SURFACE CONTACT AROUND VENTILATORS ABSOLUTELY WEATHERPROOF
SMALL AMOUNT OF PUTTY

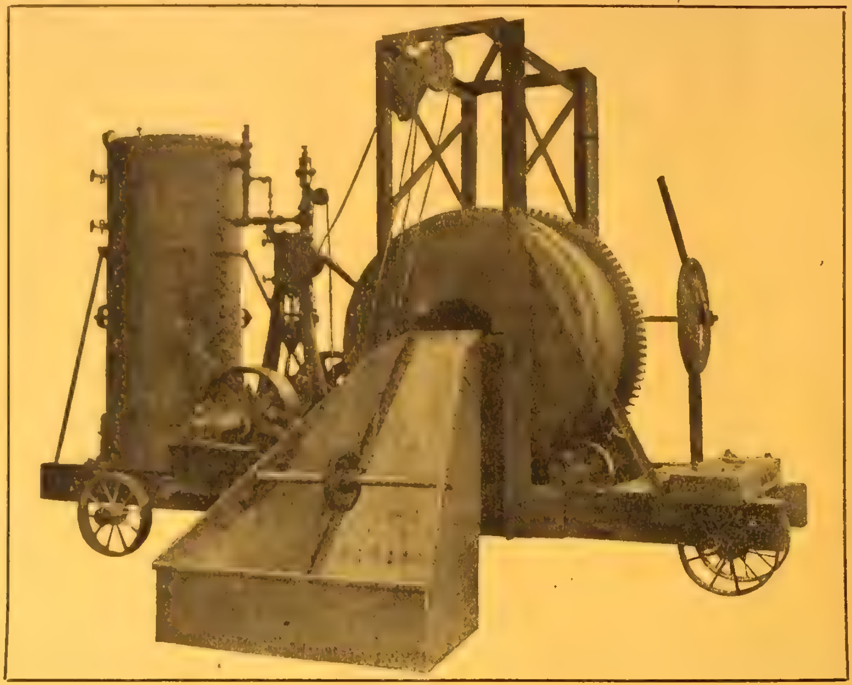
Our other products include Kahn Truss Bars, Rib Bars, Hy-Rib, Rib Metal, Trus-Con-Chemical-Products

Trussed Concrete Steel Co. of Canada
Limited

Head Office and Works: WALKERVILLE, ONT.

BRANCHES

Toronto Montreal Winnipeg Vancouver



WHY should you buy a RANSOME?

When buying a Concrete Mixer

Its not the first cost

But the ultimate cost that counts

You can undoubtedly find many concrete mixers whose first cost is less than the Ransome—but is their ultimate cost less? That's the point.

You cannot afford to buy a machine that is not ever reliable, is not satisfactory in operation, is inefficient.

Our Ransome Mixer is the most reliable, efficient and durable mixer on the market. Simple in construction—repair bills are practically nil.

Considering quality and real value in Concrete Mixers—there is no cheaper machine on the market. All sizes in stock.

F. H. Hopkins & Co.
MONTREAL
Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.

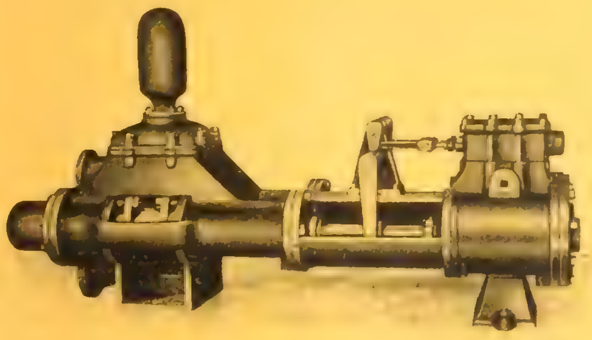
Vol. 25 Toronto, May 24, 1911 No. 21

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

We manufacture Steam and Power Pumps
Condensers, Travelling Cranes, etc.



Write for Catalogue

The Smart-Turner Machine Company
HAMILTON, ONTARIO Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

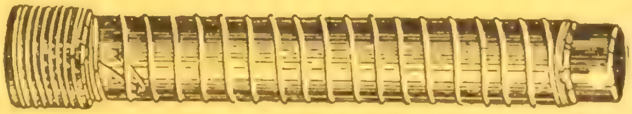
Lowest Prices for Import.
ON

Structural Material

ANGLES BEAMS
CHANNELS PLATES
TEES, Etc.

Try us with your next enquiry.

A. C. Leslie & Co., Limited
Montreal



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS
for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

THEODORE ROOSEVELT

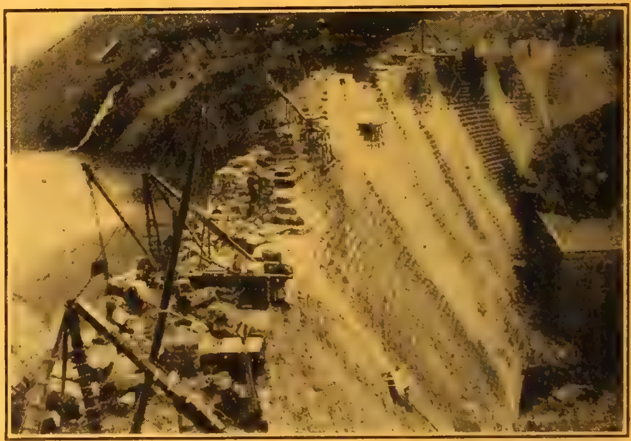
OFFICIALLY OPENED THE ROOSEVELT DAM, MARCH 18TH

This is one of the Largest Storage Dams in the United States and was built with—

"American" Engines and Derricks

Each of the Derricks set from 60 to 85 yards of material a day **more than the Governments' estimate.**

It makes no difference what your conditions are, we can supply suitable **Hoisting Machinery** and you'll be under no obligation whatever if you ask for our prices and information.



Name

Address

Please send information and prices on
AMERICAN Derricks and Engines
AMERICAN HOIST & DERRICK CO.
ST. PAUL
MINN.
C R

SEND THE COUPON

AUTHORIZED AGENTS

Gorman, Clancey & Grindley, Edmonton and Calgary, Alta. and Nelson B. C.
Vancouver Machinery Depot, Ltd., Vancouver, B. C.
J. L. Neilson & Co., Winnipeg, Man.
Dunn Bros. Winnipeg, Man.
J. A. McTaggart, Winnipeg, Man.

It is perhaps not generally known

that we have an Information Department consisting of trained and practical men, whose time is employed solely in answering enquiries from people interested in cement.

Now it will be readily understood

that out of the mass of enquiries that come to us, there are a number that include questions as to what might be termed Allied Industries. These we now answer to the best of our ability, but we could answer them still more satisfactorily, if manufacturers of materials used in conjunction with cement would co-operate to the extent of sending copies of their catalogues and other literature to be placed on file in our office for reference.

We should like to obtain

the names and addresses, together with catalogues, and any other obtainable information of manufacturers of and dealers in:

1. **Concrete Machinery**
2. **Building Blocks**
3. **Cement Bricks**
4. **Tile Molds**
5. **Fence Posts**
6. **Re-inforcing Material**
7. **Water-proofing Compounds**

It is not alone for our own convenience that we make this suggestion ; firms who manufacture or deal in such articles will find it to their own advantage to have this information in the hands of our Information Department, thereby enabling us to hand on to them from time to time enquiries for such materials as they severally make.

In sending catalogues, literature or information, please address same to "Sales Department."

The——

Canada Cement Company

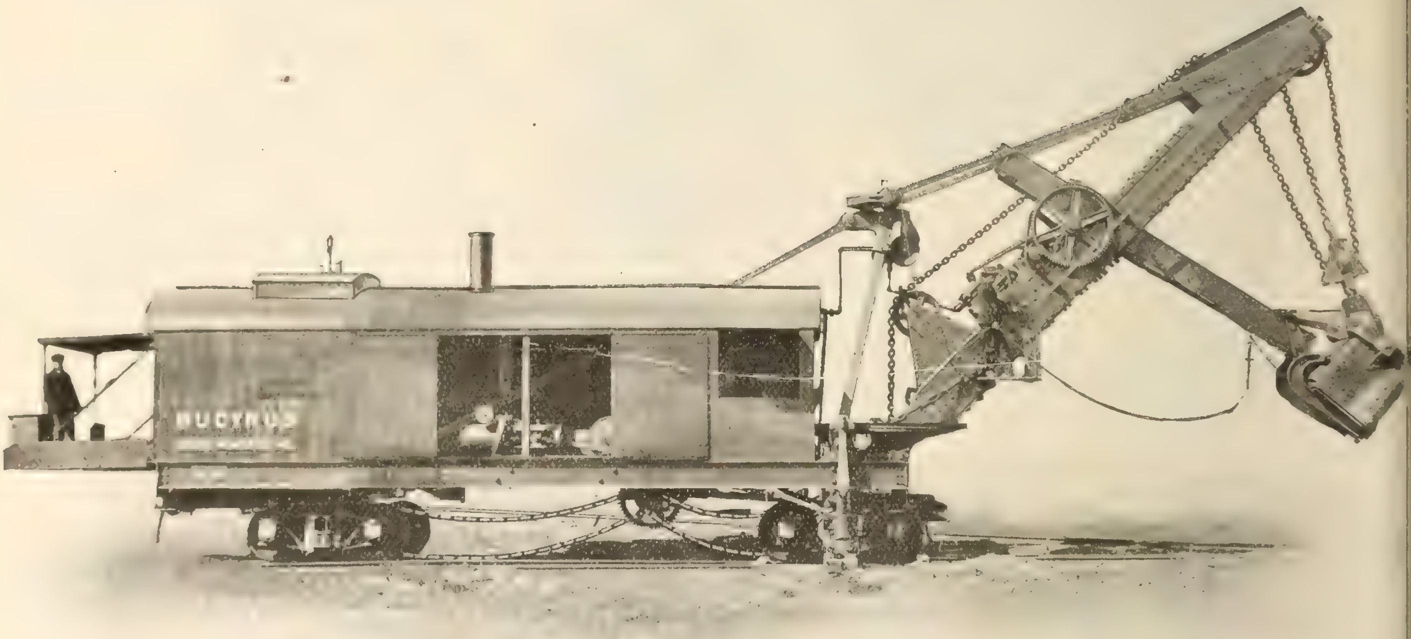
Limited,

Banque National Building - - - MONTREAL

Modern Quarries

are worked with

Steam Shovels



BUCYRUS SHOVELS MADE SPECIALLY FOR HEAVY WORK.

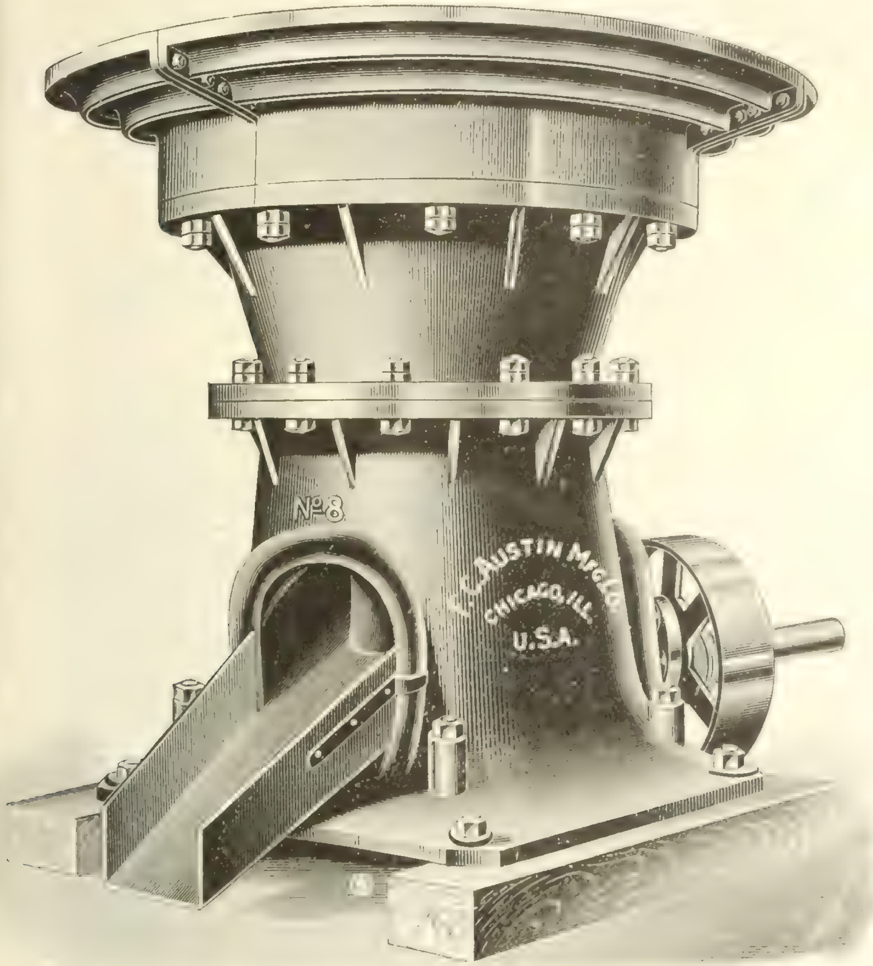
LOCOMOTIVES, CARS, TRACK, ETC.

Full Details on Request.

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

Rock Crushers


No 8
F. C. AUSTIN MFG. CO.
CHICAGO, ILL.
U.S.A.

We Design and
Erect Complete
and up-to-date

**Crushing
and
Screening
Plants**

Jaw and Gyratory Crushers

STEAM DRILLS, STEEL, FUSE, ETC.

SPECIAL DRILLS FOR DEEP DRILLING.

DERRICKS, SKIPS, WIRE ROPE, BLOCKS, Etc.

LIMITED

**Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.**

CLASSIFIED INDEX OF ADVERTISERS

Architects Page
[illegible] 88
Weeks, Arthur I 88

Architectural Iron Work
Canada Wire Goods Mfg. Co.... 70
Dennis Wire & Iron Works 77
Meadows Co., Geo. B 33

Air Compressors
Escher Wyss & Co 69

Air Valves, Automatic
Marsh, J. P. 80

Asphalt Plant
East Iron Machine Co. 73

Buckets
American Hoist & Derrick Co.. 2
Sackett Screen & Shute Co........

Belting
Federal Engineering & Supplies, Ltd 72

Blowers
Sturtevant Co., B. F............. 83

Boilers
Case Threshing Machine Co....... 79
Inglis, John........................ 67
Jenckes Machine Co............... 2
Leonard & Sons, E. 73
Marsh & Henthorn................ 70
McDougall Caledonian Iron Works 69
Mussens Limited.................. 4
Waterous Engine Works Co....... 77

Brick Machinery and Supplies
Berg Mfg. Co......................
Wert C. S. ....
Whitehead, John.................. 25

Brick
American Enamelled Brick Co.....
Don Valley Brick Works 7
Hamilton Pressed Brick Co........
Milton Pressed Brick Co........... 76
Port Credit Pressed Brick Co...... 86
Toronto Pressed Brick Co.......... 23

Brickmaker's Supplies
Sackett Screen & Shute Co........

Bridges (Steel)
Attica Bridge Co...................
Canadian Bridge Co................ 84
Cleveland Bridge Co............... 84
Dickson Bridge Works..............
Dominion Bridge Co................ 84
Hunter Bridge and Boiler Works.. 30
Phoenix Bridge and Iron Works.... 85
Pennsylvania Steel Co............. 84

Cement
Alsen Portland Cement Co......... 74
Britnell & Co..................... 80
Bremner, Alex..................... 87
Canada Cement Co................. 3
McNally & Co., W.................. 85
Morrison & Co., T.A.............. 88
Rogers, Alfred Limited 9

Concrete Pipe
Dominion Concrete Co............ 22
Lock Joint Pipe Co................ 28

Cement Waterproofing
Ceresit Waterproofing Co. 33
Hercules Waterproof Cement Co.. 29
Maashendel, F. P 31

Cranes, Travelling & Locomotive Page
American Hoist & Derrick Co...... 2
Armstrong, H. J....................
Brown Hoisting Machinery Co..... 77
Males Co 64
Willis Shaw Machinery Co 64

Conduits
Conduits Co., Limited....... 87

Crushed Stone and Granite
Sand and Supplies. 85

Concrete Mixers and Machinery
Canada Foundry Co................. 20
Cropp Concrete Machinery Co.... 82
Famous Block Machine Co......... 19
Gould, Shapley & Muir 16
Hopkins & Co., F., H.............. 92
Jenckes Machine Co............... 2
London Concrete Machinery Co.... 33
Milwaukee Mixer Co. 16
Mussens Limited................... 4
Morrison & Co., T. A.............. 88
Vining Bros........................ 73
Wettlaufer Bros.. 10

Contractors' Plant
American Hoist & Derrick Co....... 2
Acme Eqpt. & Engineering Co. 75
Beatty & Sons, M. 6
Hepburn, John T.................. 12
H. & E. Lifting Jack Co..........
Hopkins & Co., F.H.............. 92
International Marine Signal Co.... 8
Willis Shaw Machinery Co....... 64
Meaford Wheelbarrow Co. 76
Marsh & Henthorn................. 70
Montreal Locomotive Works....... 32
Mussens Limited.................. 4
Oshkosh Logging Tool Co.......... 26
Ritchie Contractors Supply Co. ....
Tiffin Wagon Co...................

Crushers (Stone and Rock)
Berg Machinery Co.................
Case Threshing Machine Co........ 79
Hopkins & Co., F. H.............. 92
Jenckes Machine Co............... 2
Males Co......... 64
Mussens Limited.................... 4
Morrison & Co., T. A.............. 88
Willis Shaw Machinery Co.. 64

Corrugated Iron
Galt Art Metal Co................. 72
Metallic Roofing Co............... 71
Metal Shingle and Siding Co......
Ormsby, A. B., Limited.......... 11
Roofers Supply Co................ 87

Contractors
Bennett, Robt. ....
Foundation Co...... ....
Holmes, Fred. ....
McIlwraith, Jas. A............... 88
Nadel & Adler..................... 88
Wells & Gray......................

Coal Handling Apparatus
American Hoist & Derrick Co 2
Down Draft Furnace Co............ 75

Derricks and Derrick Fittings
American Hoist & Derrick Co....... 2

Drills
Beatty & Sons M 6
Canadian Rand Co..................

Drilling Contractors
Harvey, J......................... 89

Dredges Page
Beatty & Sons, M 6
Males Co.......................... 64
Willis Shaw Machinery Co 64

Dry Kilns
Sturtevant Co., B. F.............. 83

Electrical Apparatus, Motors
Canada Ford Co. 34

Engines
Case Threshing Machine Co....... 79
Canadian Boving Co............... 25
Inglis, John....................... 67
Jenckes Machine Co.... 2
Leonard & Sons, E................ 73
Mussens Limited......... 4
Sturtevant Co., B. F.............. 83
Waterous Engine Works Co........ 77

Engineers (Civil) and Mechanical
Barber & Young. 88
Chipman & Power.................. 88
Bowman & Connor................ 88
Farmer, John T................... 88
Fuce, Edw.O...................... 88
Galt Engineering Co., John........ 88
Glaubitz, H. J.................... 88
Hancock, H. Syd................... 88
Inglis, John 67
Kennedy, Jas. C.................... 88
Lea & Ferguson.................... 88
Mace, T. Harry.... 88
Mitchell, C. H..................... 88
McRae, John B...................... 88
Moore & Scollan................... 88
Taylor, James..................... 88

Exhaust Heads
Sturtevant Co, B. F.............. 83

Filters
American Water Softener Co.......

Friction Clutches
Berg Machinery Co.................

Field Instruments
Gurley, W. & L. E................ 70

Fire Brick
Gibb, Alexander...... 81

Fire Apparatus
Morrison & Co T. A............ 88
Seagrave, W E.................... 80

Fireproof Doors and Windows
Douglas Bros...................... 18
Mussens Limited.................. 4
Ormsby, A. B....................... 11

Gauges, Steam, etc.
Marsh, Jas. P.... 80

Granite and Marble
Laurentian Granite Co............. 89
Missisquoi Marble Co.............. 89
Smith Marble & Construction Co.

Glass Page
Chance Brothers & Co.............
Consolidated Plate Glass Co.......
Luxfer Prism Co................. 27
Thompson & Co., B. & S. H......
Toronto Plate Glass Importing Co. 1

Heating Apparatus
Jenckes Machine Co................ 2
Leonard & Sons, E................ 73

Hoisting Machinery
American Hoist & Derrick Co. 2
Beatty & Sons, M................. 6
Canada Ford Co. 34
Inglis, John........................ 67
Jenckes Machine Co............... 2
Hopkins & Co., F. H.............. 92
London Gas Power Co............. 68
Marsh & Henthorn................. 70
Mussens Limited.................. 4
Sturtevant Co., B F.............. 83

High Pressure Pipe Lines
Escher Wyss & Co................. 69

Hydrants
Canada Iron Corporation.......... 87
Gartshore-Thomson Pipe Co...... 86
Kerr Engine Co...................

Interior Finish and Doors
Anglin, S. 74
Batts Limited ....
Canada Office & School Furniture Co 83
DeLaplante, Ltd. 81
Bryan Mfg. Co..................... 71
Eaton & Sons, J. R. 81
Georgian Bay Shook Mills........
Rhodes Curry & Co..... ....
Tillson Co. 19
Wilson Bros. 78

Lime
Christie, Henderson & Co.......... 80
Jamieson Lime Co.................
Standard White Lime Co 75

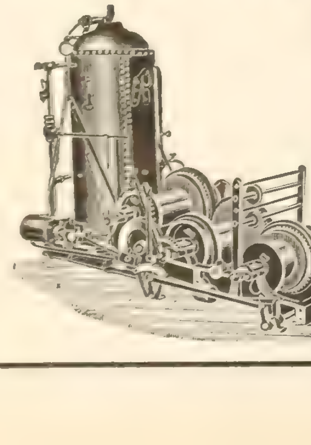
Metal Lath
Galt Art Metal...... 72
Metallic Roofing Co......... 71
Noble C. W. 74

Meters
Hopkins & Co., F. H. 92
McDougall Caledonian Iron Works 69
Neptune Meter Co.......... 71

Paving and Paving Materials
Dominion Carbolineum Works..... 91
Metropolitan Paving Brick Co. 83
Ontario Asphalt Block Co. 74
Shawmut Paving Brick Co.........
Silica Barytic Stone Co. of Ontario 89

(Continued on page 10)

M. Beatty & Sons, Limited **Welland, Ontario, Canada**



Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows
Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

SIMPLE PERFECT

CLEAN WATER

For MANUFACTURERS or MUNICIPALITIES

Can be obtained by using the

"TORRENT" or "PULSOMETER"

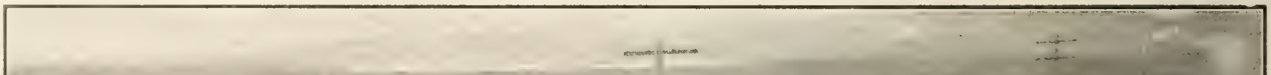
FILTER

Complete information furnished on request

International Marine Signal Company Limited

OTTAWA, CANADA

GRAVITY PRESSURE



Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Pag
Albert Mfg Co	
Bremner & Co	80
Calkins, H W	80

Pipe

American Spiral Pipe Works	75
Canadian Pipe Co	86
Dominion Wood Pipe Co	12
Dominion Concrete Co	22
Gartshore-Thomson Pipe Co.	86
Lock Joint Pipe Co	28
Munderloh & Co	11
National Iron Works	87
Pacific Coast Pipe Co.	1
Pedlar People	17

Plumbers' Supplies

Standard Ideal Co.	31

Power Engines

Inglis Co., John	67

Paints and Varnishes

International Varnish Co	30
Paterson Mfg. Co.	

Pile Driving Machinery

American Hoist & Derrick Co.	2
Lincoln Construction Co.	82

Pumps and Pumping Machinery

American Well Works	
Beatty & Sons, M	6
Escher Wyss & Co.	69
Goulds Pump Co.	9
Hopkins & Co., F. H.	92
Inglis Co , John	67
Leonard & Sons, E	73
McDougall Caledonian Iron Works	69
Mussens Limited	4
Ontario Wind Engine & Pump Co.	82
Smart-Turner Machine Co.	1
Waterous Engine Works Co	77

Roofing Contractors

Schwoerer & Sons, A.	

Roofing Materials

	Page
Asbestos Mfg Co.	24
Galt Art Metal Co.	72
Metallic Roofing Co.	71
Metal Shingle & Siding Co.	
Noble, Clarence W	74
Paterson Mfg. Co.	
Philip Carey Co.	
Roofers Supply Co.	87
Standard Paint Co.	

Railway Supplies

Gartshore, John J.	83
Hopkins & Co., F. H.	92
Mussens Limited	4

Reinforcements. Concrete and Steel

Ambursen Hydraulic Construct'n Co.	89
Canada Wire Goods Mfg. Co.	70
Concrete Form Engine Co.	71
Steel Co. of Canada	23
Steel & Radiation	90
Trussed Concrete Steel Co.	68
Turner, C. A. P.	78

Road Machinery

Case Threshing Machine Co.	79
Hamilton Machinery Co.	15
Morrison & Co., T. A	88
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co	20
Hopkins & Co., F. H	92
Mussens Limited	4
Males Co	64
Willis Shaw Machinery Co	64

Stone

Britnell & Co.	80
Brodie, Jas.	83
Christie, Henderson & Co.	80
Consolidated Stone Co.	72
Contractors' Supply Co.	80
Corinthian Stone Co.	
Crushed Stone, Limited	73
Doolittle & Wilcox	70
Hagersville Contracting Co.	11

Sand and Gravel

Sand & Supplies	85

Stone

	Page
Laurentian Granite Co.	89
McMillan & Son, R.	
Morrison & Co., T. A.	88
Myers, Oakley	73
Roman Stone Co	13
Sackville Freestone Co.	8
Sand & Supplies	85
Thames Quarry Co.	82

Steam Apparatus

Sturtevant Co., B. F.	83

Submarine Diver

Rouleau, Joseph N.	89

Structural Iron and Steel

Buffalo Steel Co.	
Dominion Bridge Co	84
Steel Co. of Canada	23
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	89
Salter, W. H.	85
Steel & Radiation	90

Sewer Pipe

Britnell & Co	80
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
GartshoreThomson Pipe Co.	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	28
National Iron Works	87
Ontario Sewer Pipe Co	21
Standard Drain Pipe Co.	21

Stationary and Power Engines

Case Threshing Machine Co.	79

Slate

Roofers Supply Co.	87

Steel Shingles and Ceilings

Galt Art Metal Co.	72

Smoke Stacks

Leonard & Son, E.	73

Tents

Woods Limited	79

Safes and Vaults

Taylor, J & J	31

Testing and Inspection Bureau

Hunt & Co., Robt. W	73

Stone

	Page
Anderson, Geo.	18

Tiles

Smith Marble & Construction Co.,	

Tanks and Stand Pipes

Berg Machinery Co.	
Inglis, John	67
Jenckes Machine Co.	2
Leonard & Sons, E.	73
Marsh & Henthorn	70
McDougall Caledonian Iron Works	69
Ontario Wind Engine & Pump Co.	82

Trade Journals

Castellanos A. W.	82

Valves

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co	86
Kerr Engine Co.	14
Marsh & Co, Jas	80
Standard Fitting & Valve Co	80

Ventilating and Heating Apparatus

Gardiner & Gaskill	
Sturtevant Co., B. F.	83

Water Softeners and Filters

Berg Machinery Co	
American Wafer Softener	

Wire Rope

Greening Wire Co., B.	26
Smith, Thos. & Wm	
Steel Co. of Canada	23

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	70
Crescent Wire Iron Works	83
Sackett Screen & Shute Co	

Water Wheels

McDougall Caledonian Iron Works	69
Canadian Boving Co.	25

Water Turbines

Escher Wyss & Co.	69

Wheelbarrows

Sackett Screen & Shute Co.	

An Ideal Mixer For

Sidewalk and Roadwork

The illustration shows the Wettlaufer new improved half-yard heart-shape mixer showing drum discharging This mixer is built with all steel frame and very compact, so that it will go in a very small space. Can be equipped with steam, gosoline or electric power.

Wettlaufer Bros.

178 Spadina Ave.,
Toronto

A. R. Williams Machinery
Company, 15 Dock St.,
St. John, N. B.

W. E. Ransome,
Moose Jaw, Sask.

MUNDERLOH & Co Ld.
MONTREAL.

SEAMLESS STEEL TRACTION AND LIGHTING POLES.

MANNESMANN SEAMLESS STEEL PIPES. FOR GAS & WATER MAINS.

IN LENGTHS UP TO 40 FEET.

AN IMPROVEMENT ON CAST IRON.

ALL PIPES TESTED 75 ATMOSPHERES - BEFORE LEAVING WORKS.

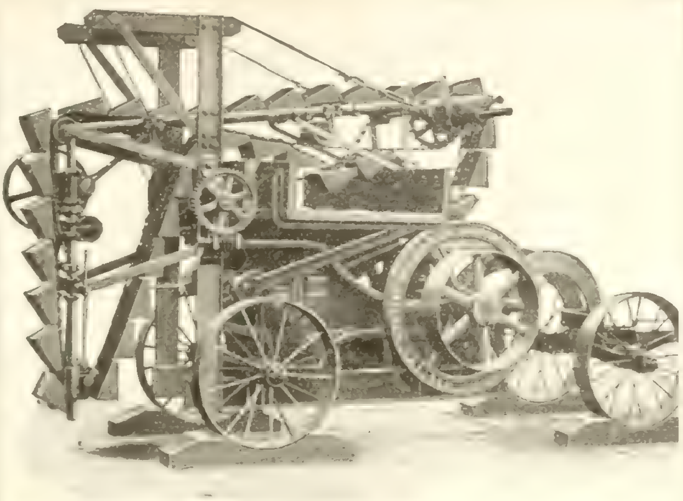
WRITE US FOR ILLUSTRATED BOOKLET

SEND US YOUR ENQUIRIES.

WE ARE SOLE AGENTS IN CANADA FOR —

MANNESMANN TUBES.

FOR ALL PURPOSES.



Steel Castings and No Lost Motion

forged steel yoke, cross bars on yoke remove all strains from main frame, moving jaw given a compound oscillating and reciprocating motion so that crushing is **continuous**, are features of the

Aurora Steel Rock Crusher

Its compact form combines great strength with light weight, making it very portable, and **specially adapted for contractors' use.** Strongest and most durable crusher on the market combining maximum product with minimum power. Adjustable to various sized stone. *Get our Special Crusher Catalo.*

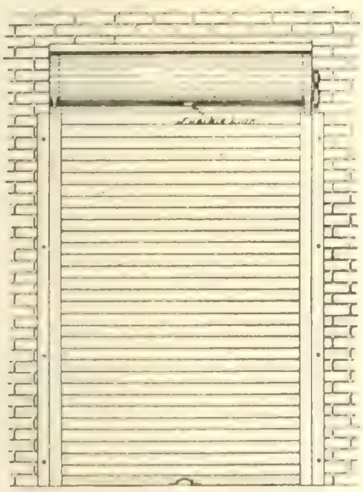
Western Wheeled Scraper Co.

Earth and Stone Handling Machinery **Aurora, Ill.**

The Durability of our

Rolling Steel Door

is extraordinary



At the N.Y. C.R.R. Sheds, 31st Street, New York, our **Rolling Steel Doors** have been in continual service **for over twenty-three years** and still give the very best of satisfaction. Durability and ease of operation are as big a feature in our Rolling Steel Doors as their Fireproof Qualities. Specify our patented Rolling Steel Door. It has everything in its favor.

Experts in Fireproof Windows and Doors

A. B. Ormsby, Limited

Factories { Corner Queen & George Streets - TORONTO
677-81 Notre Dame Avenue W., WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

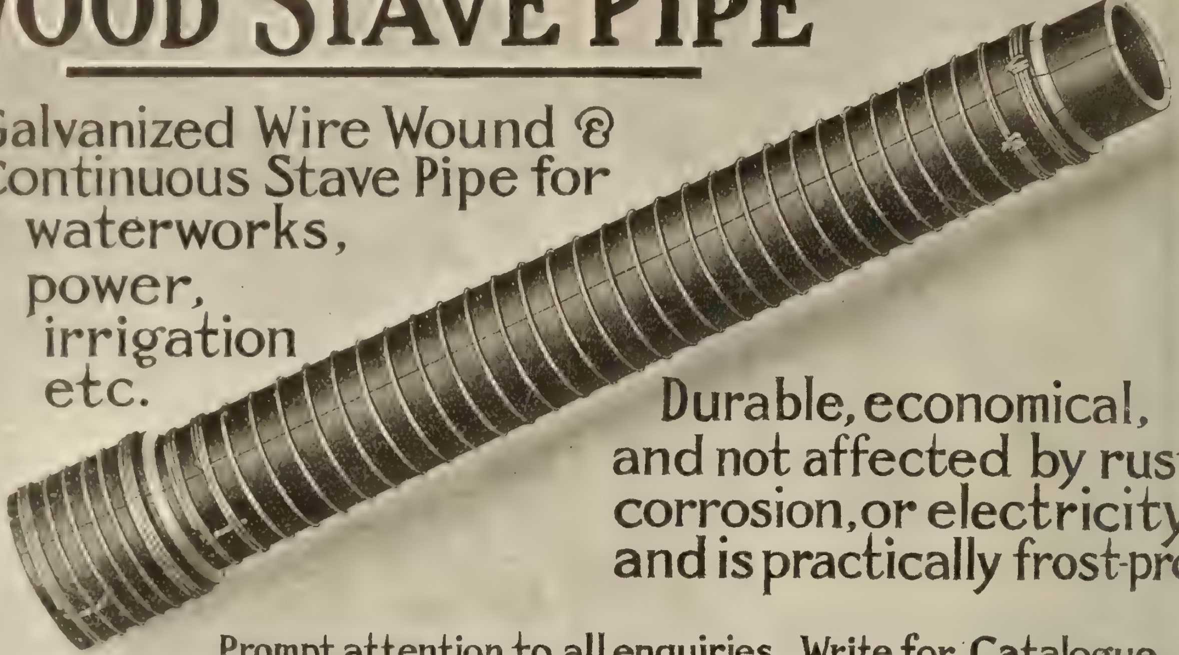
The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.



WOOD STAVE PIPE

Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.

Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Have you any use for a Derrick?

There are large plans under way. Large contracts are being placed. In all directions there is bustle and activity. Everything points to an unusually busy season for construction work of all kinds. But what about equipment?

John T. Hepburn

Scotch Derricks

are in use by all leading contractors in all parts of the country. They are designed and built for hard work, combining safety and high efficiency, with low operating cost. Being made in standard sizes, any part can be replaced at short notice. They may be operated by hand or power—are fitted with single and double purchase gears—powerful band brake—and safety locking device that prevents boom from falling.

We are busy now. We shall be busier in two or three weeks
Better place your order to-day to secure early delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company
Limited

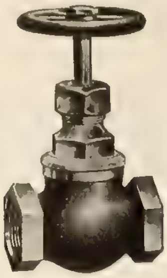
Head Office: 504-5 Temple Building, TORONTO

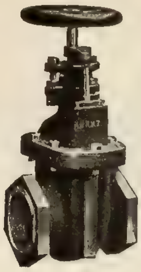
E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

Water Crane and Hydrant Combination

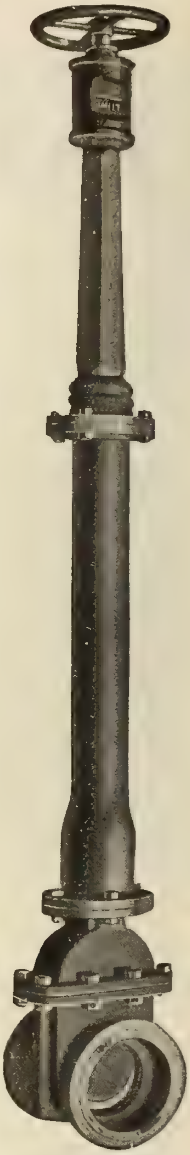




KERR VALVES

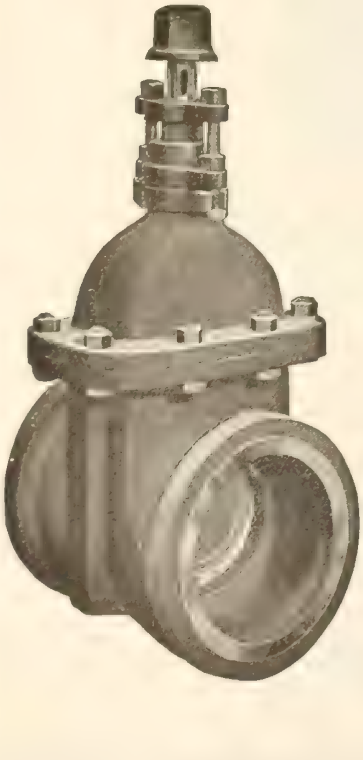
For City Waterworks

We manufacture valves and hydrants for every branch of city and town waterworks. If you are in charge of any waterworks' extensions, be sure you find out about "Kerr" goods before you prepare your specifications; then specify "Kerr."

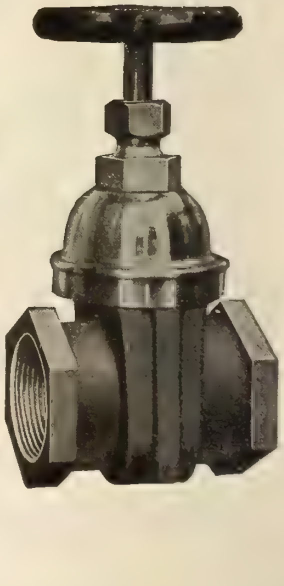


Indicator for Fire Protection Valve

Have you copy of our Catalogue?



THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.



"CHAMPION"

Steel Road Graders

NO GRADER that has appeared on the market for years has commanded such success as the "Champion." Its light draft, easy operation, extreme simplicity and thorough efficiency have brought it to the front everywhere. The "Champion" has construction exclusively its own—its superiority needs no argument to those who examine it.

Two Other "Champion" Successes :

"CHAMPION" SPRINKLERS **"CHAMPION" ROAD PLOWS**

EACH IN ITS FIELD has become an unquestioned leader. Do not place your order until you have seen them. Our catalog gives complete discription of their advantages and a copy will be sent for the asking. Write us to-day for literature and prices.

"Standard in Canada for 20 Years"

The American Road Machine Company of Canada, Limited, Goderich, Ont.

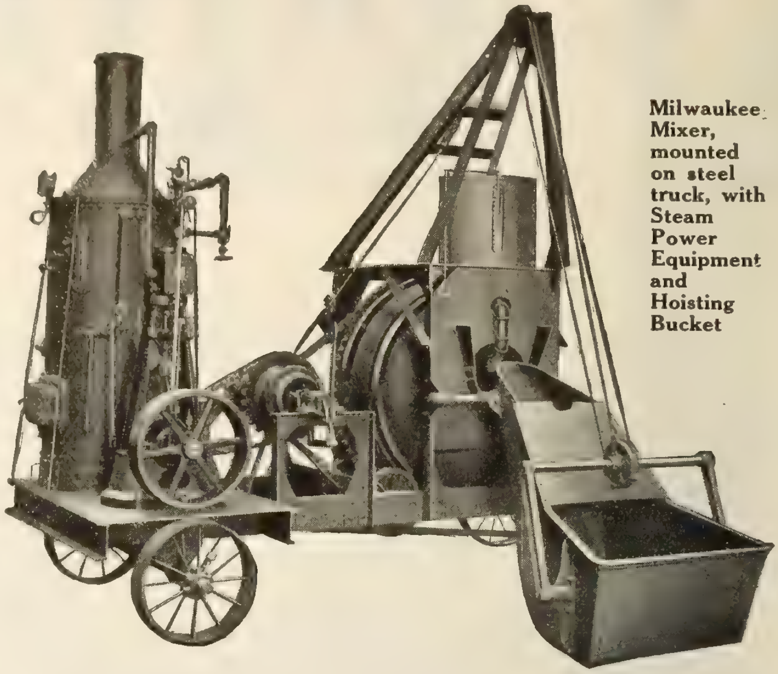
ADDRESS CORRESPONDENCE TO

The Hamilton Machinery Company, Ltd.

Sole Agents for the above Company.

Hamilton, Ont.

Also Agents for the famous Inter State Automobile



Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.

Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES:

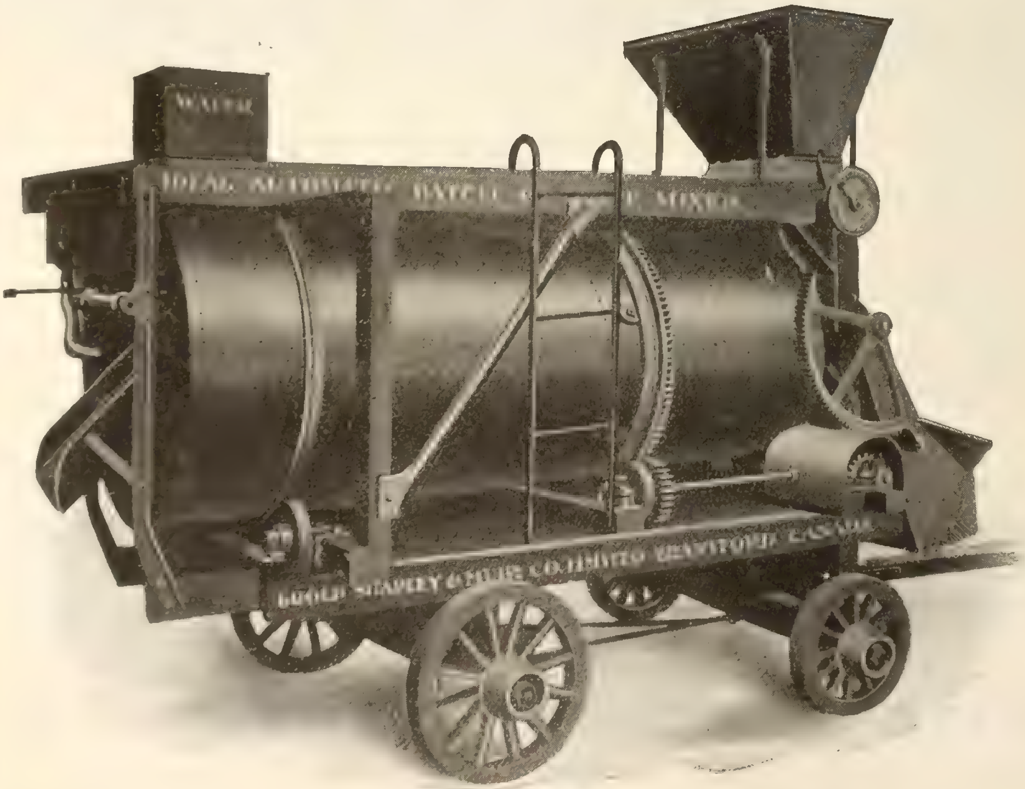
The Stewart Machinery Co., Winnipeg, Man.

C. W. Stancliffe & Co., Vancouver, B. C.

H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS



Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

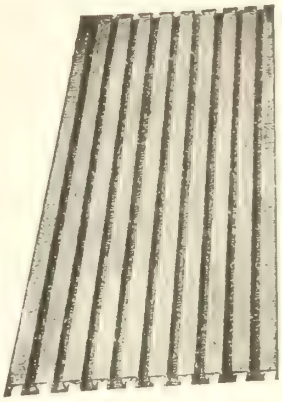
Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

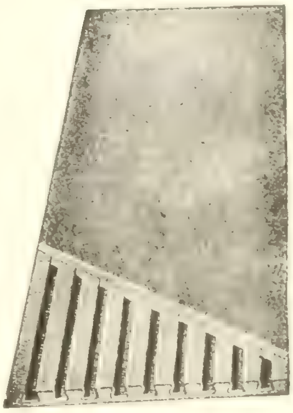
The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada

PEDLAR
FERRO-DOVETAIL PLATES



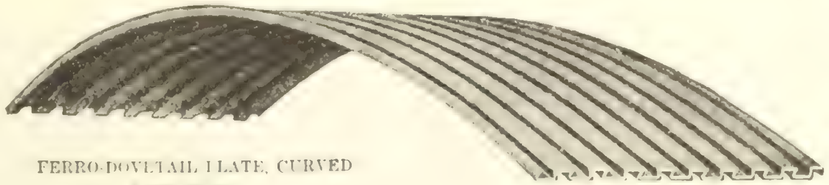
FERRO-DOVETAIL PLATE
READY TO LAY

PEDLAR FERRO-DOVETAIL PLATES meet the demand for an absolutely fireproof roofing or flooring material, wherein permanence of construction is the most vital consideration. Moreover, these plates admit of extremely rapid work. A study of the illustration herewith, will explain exactly what these plates are and how they are used. Made in both flat and curved sheets, these plates fit the steel between spans, interlock and are then at once ready for their bed of concrete on top and for plastering on the under side. When these two operations are completed the plates are completely imbedded and protected from deterioration from any cause whatsoever. Gases, acid fumes and other injurious influences have no effect on a Ferro-Dovetail roof. Moreover, they can be waterproofed with any good roof covering. Ferro-Dovetail Plates stand for economy, not only in the cost of time required to put them into position, but also in that they are fireproof and that insurance underwriters make rate concessions on buildings on which they are used.

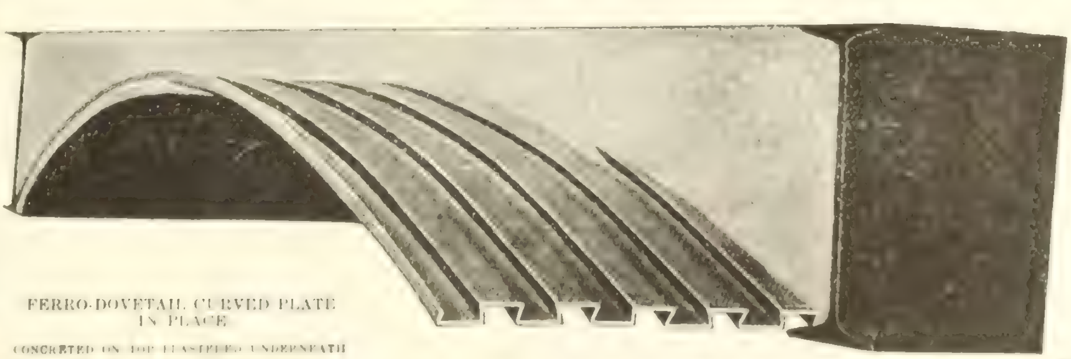


FERRO DOVETAIL PLATE
CONCRETED ON TOP, PLASTERED UNDERNEATH

For architects and builders who are not thoroughly familiar with all the details of this new idea in construction, we have prepared a special book on the subject which we will be glad to send FREE on request. This book deals with the specifications, uses and methods of erecting Pedlar Ferro-Dovetail Plates. Write for it—just ask for bulletin No. 52. Perhaps it would be well to send for it NOW.



FERRO-DOVETAIL PLATE, CURVED
READY TO LAY



FERRO-DOVETAIL CURVED PLATE
IN PLACE

CONCRETED ON TOP PLASTERED UNDERNEATH

B

The PEDLAR PEOPLE of Oshawa

ESTABLISHED
1861

HALIFAX 16 Prince St.
ST. JOHN, N.B. 42-46 Prince William St.
QUEBEC 127 Rue du Pont
MONTREAL 321-3 Craig St.
OTTAWA 423 Sussex St.
TORONTO 111-113 Bay St.
LONDON 86 King St.
CHATHAM 200 King St. W.
PORT ARTHUR 45 Cumberland St.
WINNIPEG 76 Lombard St.
REGINA 1901 Railway St. South
CALGARY 215 12th Ave. W.
EDMONTON 647 2nd Street
VANCOUVER 821 Powell St.
VICTORIA 434 Kingston St.

ADDRESS OUR NEAREST WAREHOUSE. WE WANT AGENTS IN SOME SECTIONS. WRITE FOR DETAILS. MENTION THIS PAPER.

Circular Diamond Saws

For Limestone, Marble and Sandstone

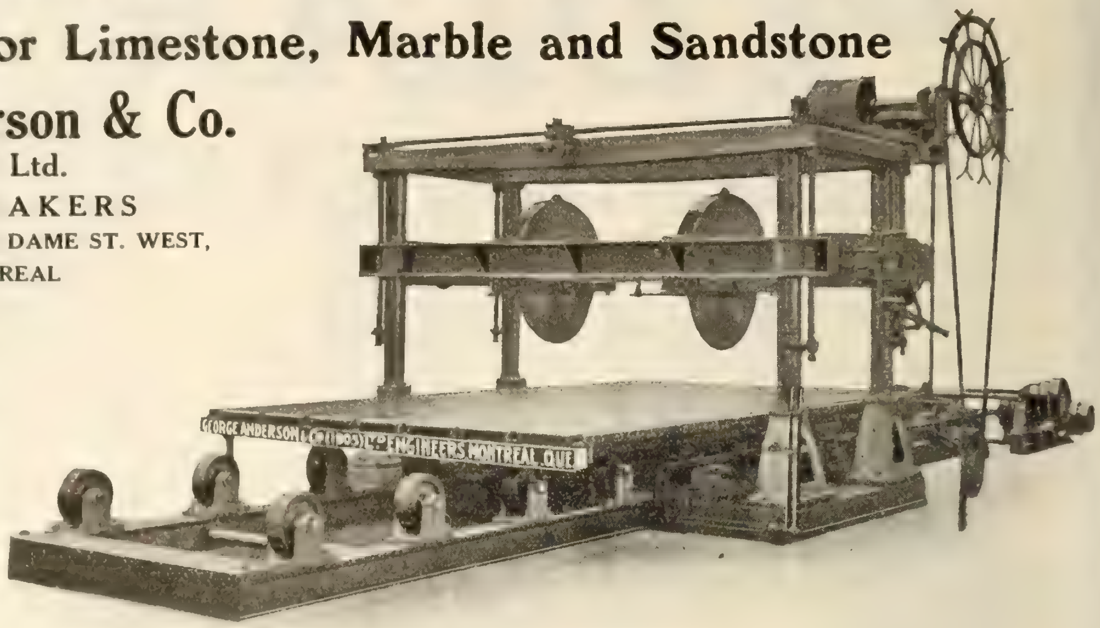
Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICE & WORKS

London, England, 82 Victoria St. S. W., Newark N.J. U.S.A. 420-422 Ogden St., Montreal Works, 157 Craig St. West, Head Works, Carnoustie, Scotland

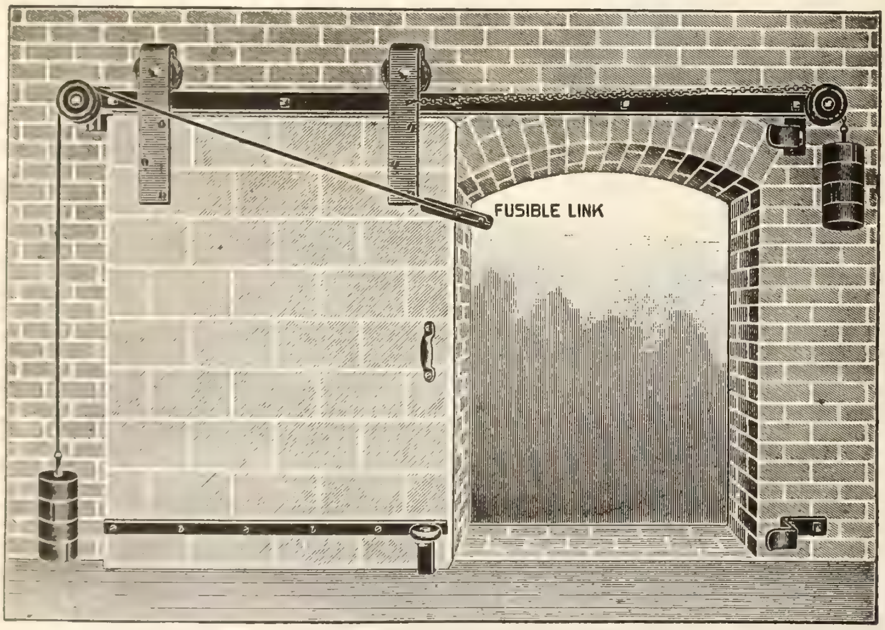
MAKERS OF

GANGS, PLANERS, MARBLE DRESSERS DERRICKS, AND ELECTRIC TRAVELING CRANES UP TO 50 TONS, QUARRY MACHINERY, GAS ENGINES AND PRODUCER PLANTS 10 H.P. TO 150 H.P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 **SINGLE AND DOUBLE TABLE**

About 50 of the above Machines at work in Canada



Fireproof Doors and Windows

We are specialists in this particular line and can solve your most difficult problems.

Estimates furnished on complete work or any part.

Have you our Literature?

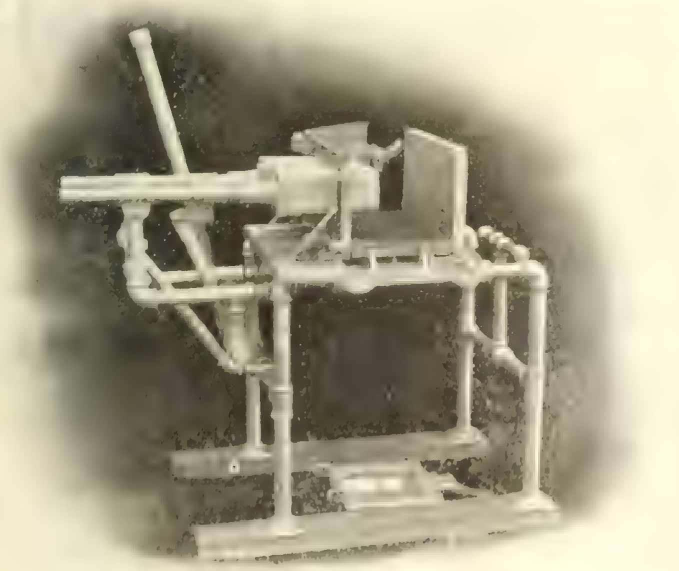
DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

The
Tillson Company
Limited
WHOLESALE MANUFACTURERS OF

Sash, Doors, Mouldings, Frames for Doors and Windows, Columns, Interior Finish of Every Description, Porch Work, Gable Ornaments, Brackets, Head Blocks, Corner Blocks, Base Blocks, Door and Window Screens, Etc.

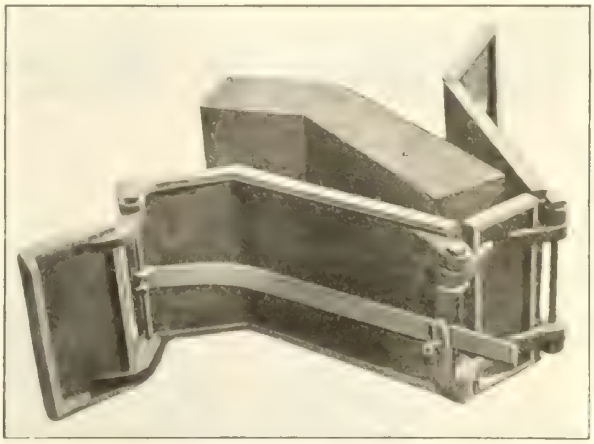
Millwork of all kinds

Tillsonburg,
Ontario



Block Machine No. I. (End Door Removed)

This machine is strong, simple, and what is more important it is the fastest outfit on the market, and you know time means money.



Famous Angle Mould

This mould will make blocks with any angle from 20 to 60 degrees in 8 or 9 inch height without having to change any parts other than for adjustment. A great many of these moulds have been sold.

Send for our Literature

Famous Machinery Co., 21 Pitt Street W.
WINDSOR, ONT.

J. H. NEW, PRESIDENT RYLAND H. NEW, VICE-PRESIDENT

"WANTED" a Car of Sewer Pipe in a Hurry

Established 1860

How many times during the busy season we are called by long distance phone and asked **"Can you ship us a car of Pipe at once"** our drain is all open and we must have the pipe immediately. Now this is just where

HAMILTON

service is of value, and it is for the very reason that we back up our promises by performance that we have been enabled to build up the largest Sewer Pipe business in Canada. We take care of those rush orders. We are a real live concern.

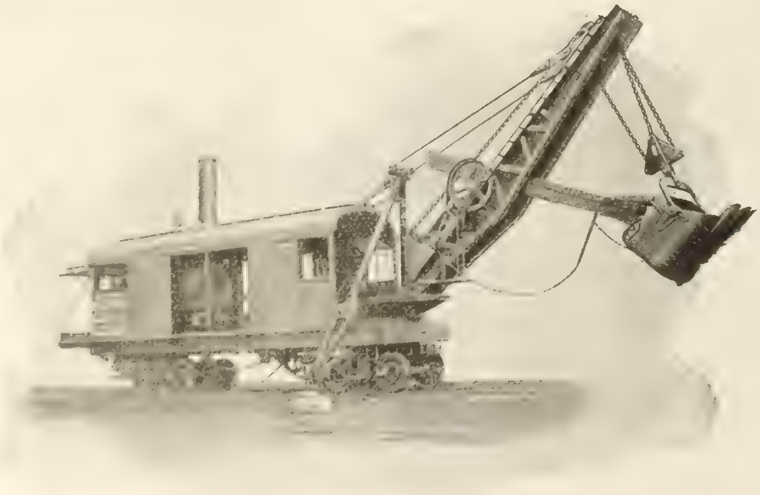
"Let us have our first chance now"

The Hamilton & Toronto Sewer Pipe Co.

HAMILTON and TORONTO **Limited**

Long Distance Phones:—Toronto, Main 990, College 1558. Hamilton, 3990, 3991, 3432.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert **Pipes**

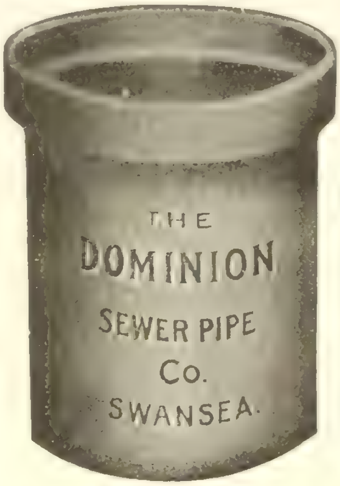
We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Large Contracts are our Specialty

The Pipe that makes
THE SEWER SURE

ROUND Pipe and SQUARE Dealings

WE carry a stock in all sizes, 4 inch to 24 inch, large enough to keep any job going regardless of the press of business in one-car orders.

That means money to you

No waiting on pipe when you place your orders for **"MIMICO"** goods, and it is also 99% right when it arrives.

It Saves You Worry
Worry Shortens Life

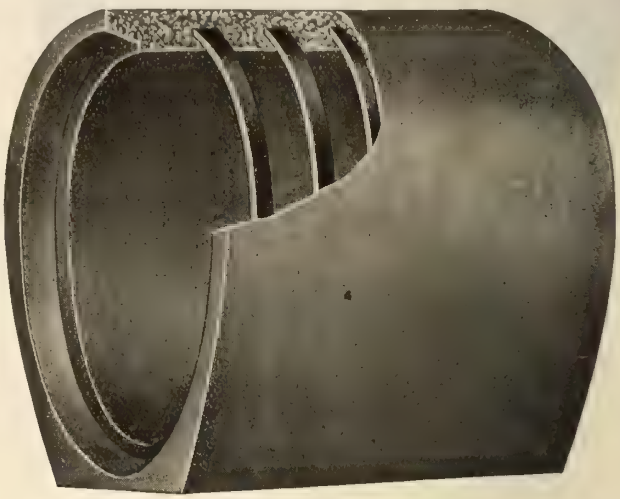
The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422, Evenings Park 3888 and 3889

Railway Engineers and Contractors

Timber culverts rot, clay pipe culverts break from frost or weight, metallic culverts rust and are woefully dear, CONCRETE CULVERTS LAST FOREVER and the price is relatively low.

The only absolutely **durable and frost-proof** culvert pipe is

REINFORCED CONCRETE



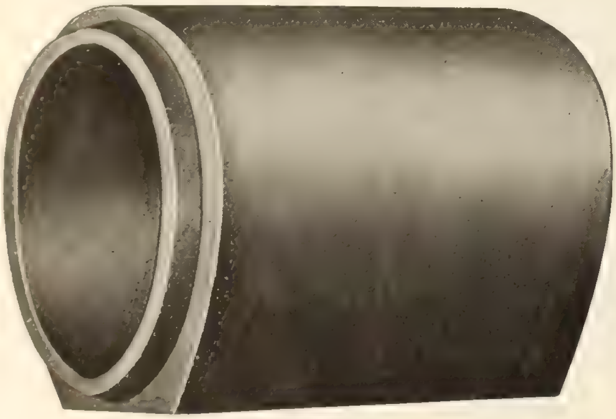
36" Section

of **first quality.** The prime requisites of first quality concrete are **good raw material, proper proportions** and **scientifically correct methods.**

We possess all these in the highest degree. Our years of experience, our facilities and our raw material enable us to make **good concrete** and make it **always good.**

Nowadays the railway engineer must get results in **permanency** as well as in other matters. The contractor too must get results if he is to stay in the game. A very important result to him is the **economy** of buying material that **holds out,** that can be handled with **facility,** and that can be procured **promptly** and at a **reasonable price.**

Don't imperil your interests by using non-durable material, or by trusting to the random hits and misses of a novice when you can buy **durable, mature,** and **guaranteed concrete pipe,** from a long-established and reputable firm.



30" Section

Mature Stock

Prompt Shipment

Quality Guaranteed

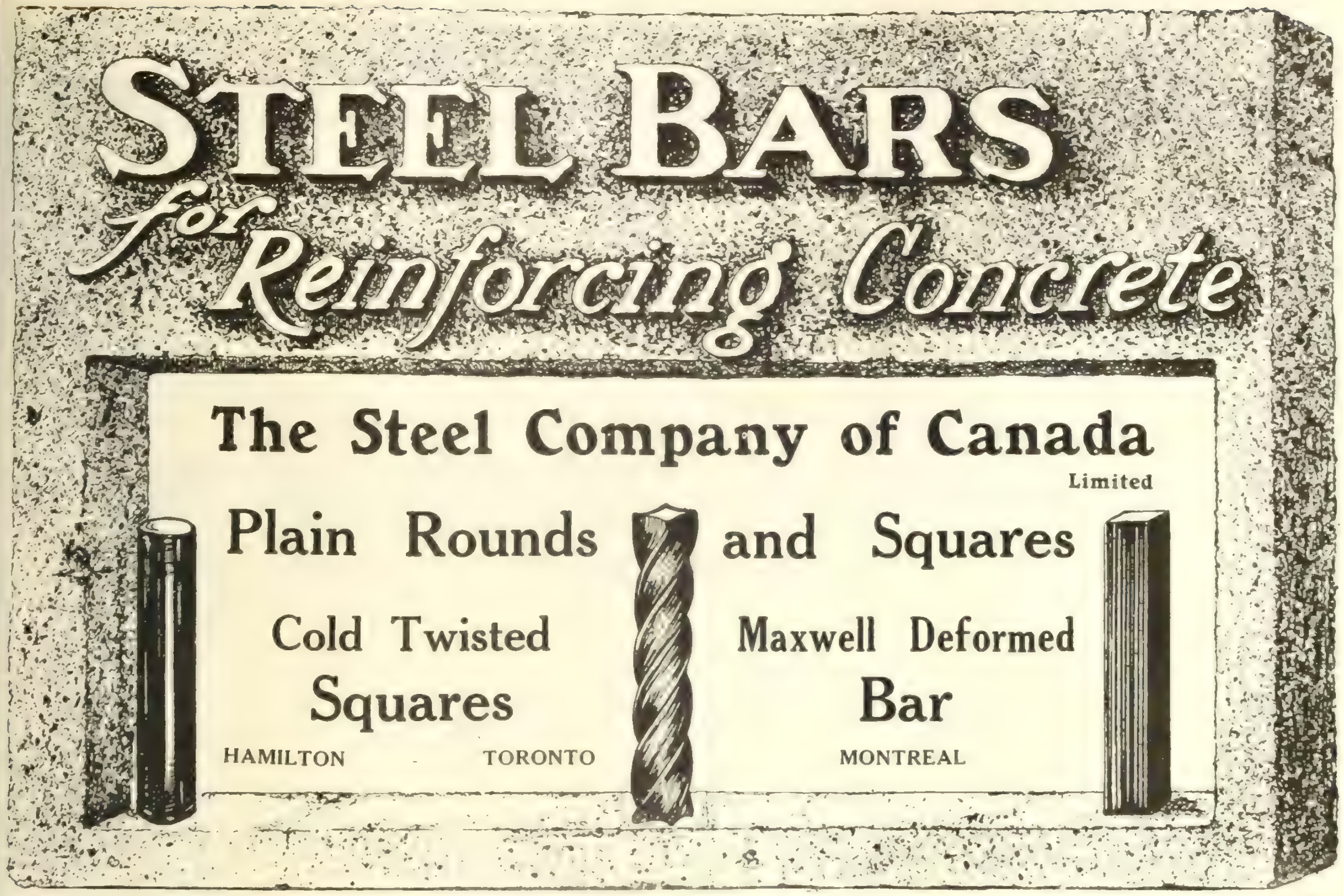
No Loss from Breakage

Low Prices

WRITE FOR CATALOGUE AND PRICES

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO



STEEL BARS
for Reinforcing Concrete

The Steel Company of Canada
Limited

Plain Rounds and Squares

Cold Twisted
Squares

Maxwell Deformed
Bar

HAMILTON - TORONTO
MONTREAL

Toronto Pressed Brick and
Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILE, CRESTINGS, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given
to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

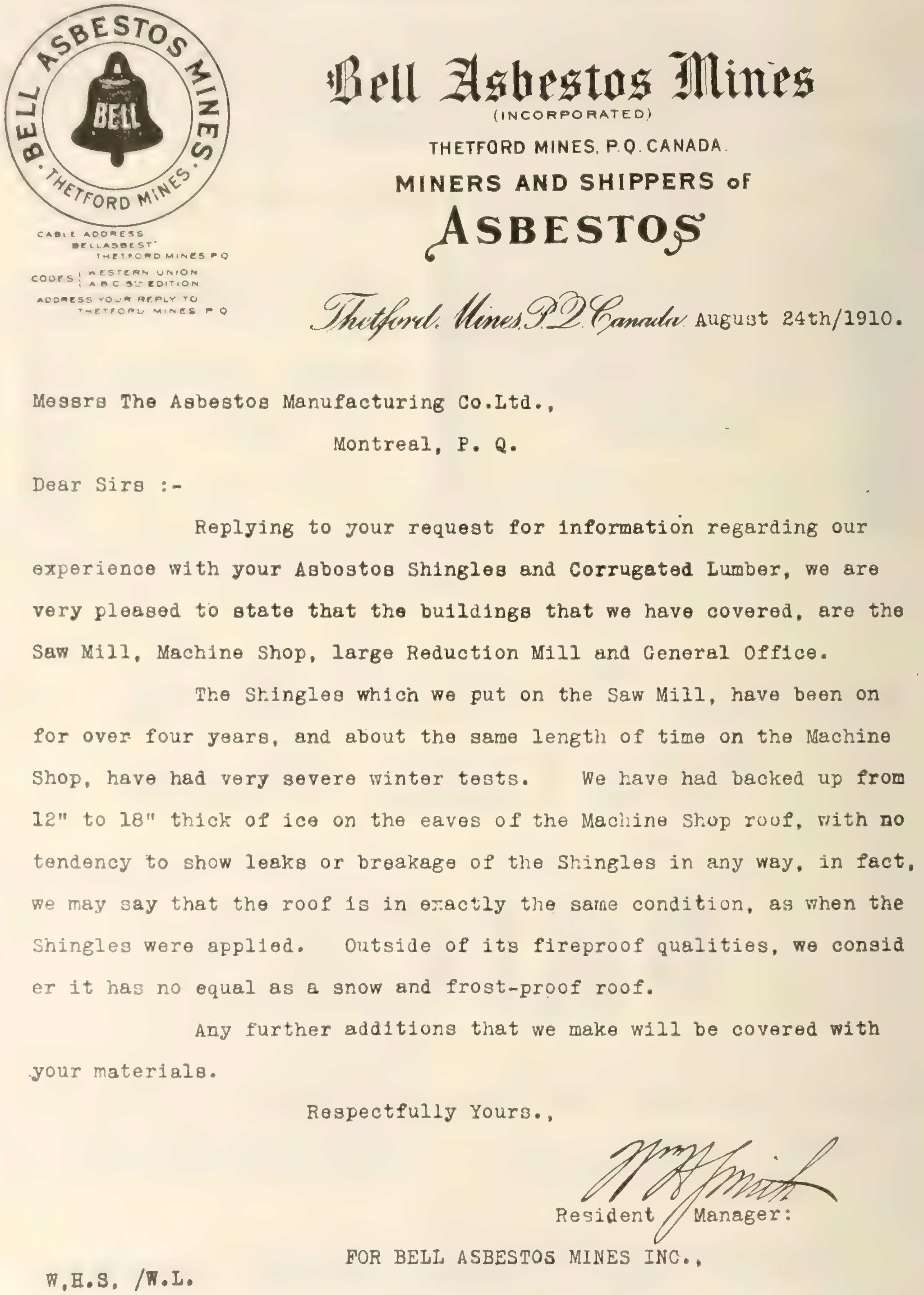
Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor

Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

Asbestos Cement Shingles

WHAT USERS SAY ABOUT THEM



Bell Asbestos Mines
(INCORPORATED)
THETFORD MINES, P.Q. CANADA.
MINERS AND SHIPPERS of
ASBESTOS

CABLE ADDRESS
"BELLASBEST"
THETFORD MINES P.Q.
CODES: WESTERN UNION
A.B.C. 5th EDITION
ADDRESS YOUR REPLY TO
THETFORD MINES P.Q.

Thetford Mines P.Q. Canada August 24th/1910.

Messrs The Asbestos Manufacturing Co.Ltd.,
Montreal, P. Q.

Dear Sirs :-

Replying to your request for information regarding our experience with your Asbestos Shingles and Corrugated Lumber, we are very pleased to state that the buildings that we have covered, are the Saw Mill, Machine Shop, large Reduction Mill and General Office.

The Shingles which we put on the Saw Mill, have been on for over four years, and about the same length of time on the Machine Shop, have had very severe winter tests. We have had backed up from 12" to 18" thick of ice on the eaves of the Machine Shop roof, with no tendency to show leaks or breakage of the Shingles in any way, in fact, we may say that the roof is in exactly the same condition, as when the Shingles were applied. Outside of its fireproof qualities, we consider it has no equal as a snow and frost-proof roof.

Any further additions that we make will be covered with your materials.

Respectfully Yours.,

Wm H Smith
Resident Manager:

FOR BELL ASBESTOS MINES INC.,

W.H.S. /W.L.

Write for literature and full information

Asbestos Manufacturing Co., Limited, 705 Eastern Townships Bank Building **Montreal, P.Q.**

Factory at Lachine, P.Q.

John Whitehead & Co.

LIMITED

Albert Work: PRESTON, ENGLAND

Makers of

Reliable **BRICK MACHINERY** Efficient

Tile and Pipe Machinery, and

CLAY WORKING PLANT

for all classes of Clays and Shales.

INQUIRIES SOLICITED. CATALOGUES POST FREE.

Established over 75 years. TELEGRAMS: Brictile, Preston

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

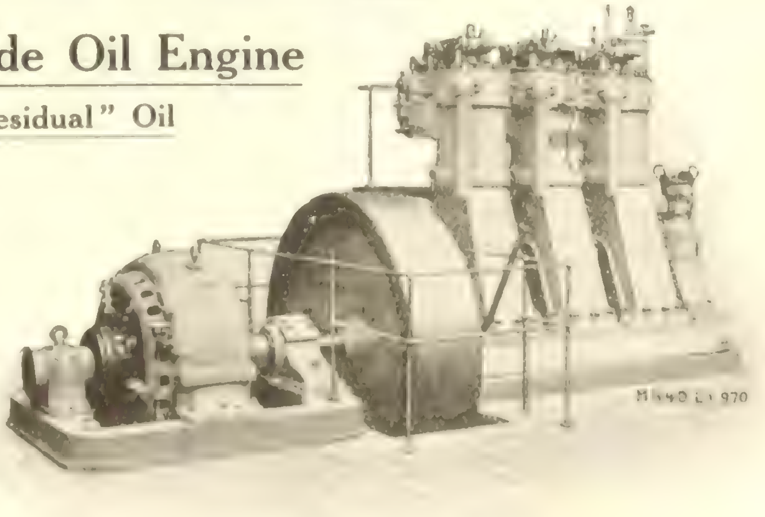
Suitable for Public and Private Buildings

The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear
No Producer
No Chimney
No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdowns
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses



HIGH SPEED **SLOW SPEED**

35 to 1000 B. H. P.

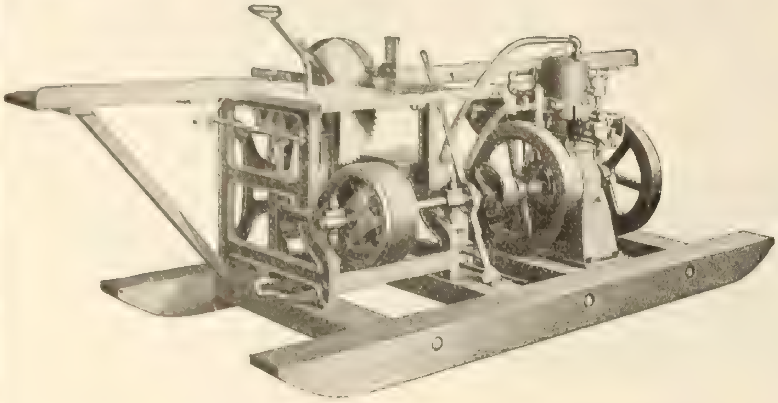
DON'T THROW AWAY **Money** IN TIME AND LABOR

Increase your profits and business by using the latest up-to-date machinery and methods.

Oshkosh Portable Saw Rigs

Will enable you to bid lower and Beat out your competitors.

Tear Off the Coupon and Mail To-day
Before your competitor gets ahead of you



Manufactured by
Oshkosh Logging Tool Company
OSHKOSH WIS.

OSHKOSH LOGGING TOOL COMPANY
Oshkosh, Wis.

Gentlemen

Kindly send me complete catalogue and prices of the Oshkosh Portable Saw Rig

Name ....

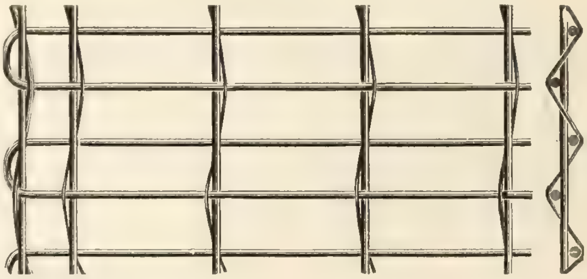
Town ....

State ....

LOW PRICES - HIGH QUALITY
QUICK SHIPMENT

Quality considered there is no wire lathing on the market cheaper than Greening's Wire Lathing. And our splendid, well-organized facilities and big output enable us to be unusually prompt in the shipment of large or small orders.

Greening's Trussed Wire Lathing



is a first-class plastering surface at the **Right Price.** It contains all the good features of a first-class metal Lath, and eliminates many objectionable features of other types Supplied with Selvage Edge, which prevents cutting or scratching in handling, in rolls up to 100 yards, and in stock widths from 24" to 48". Other widths to special specifications.

Does not "wave" or "buckle" when unrolled and lathing may be nailed directly along studs, joists or sheathing without furring, preventing lapping and insuring lowest possible cost of erecting,

Write further details and Catalogue.

The B. Greening Wire Company, Limited
HAMILTON, ONT. - MONTREAL, QUE.

FLOOD YOUR BUILDING WITH LIGHT

The illustration shows the transom of a store made of Luxfer Prisms, and the interior effect is nothing short of wonderful.

The canopy was also designed and erected by us.

BY INSTALLING
LUXFER PRISMS

Yes, there are dozens of buildings without our Prisms, but they are also without daylight.

The only way to get daylight properly distributed through any building or store (unless it is in the middle of a ten acre lot) is by the use of LUXFER PRISMS.

Advise us of your requirements and let us tell you what LUXFER PRISMS can do for you.

We can **demonstrate** every claim we make.

Luxfer Prism Co.,
Limited
100 King Street West, Toronto

Stop Your Building Until You've Decided on the Gas Question

?

If you are building and have made no provision for gas piping, you are making a grave mistake. You not only affect your own interests, but do an injustice to your client **Modern Gas Lighting and Appliances** hold a place in the world's progress that must not be overlooked. Your client wants the best that's going. He looks to you for the information. If you are the owner you certainly require the ideal when it comes to home comforts. If you build for renting purposes—you naturally wish to keep good tenants. Good tenants are like customers—give them good service and they stay. In Toronto nearly 70,000 homes and buildings are piped for gas light and fuel 80 more than with all other systems combined. In Toronto, gas piped buildings are increasing at the rate of 7,000 per year. Why is it? It's because people realize that "GAS" cannot be equalled when it comes right down to quality and actual figures.

Modern Gas is a wonder. **Modern Gas Appliances** have revolutionized the gas business. We want you to consult with us now. We want you to see the "**new things**" before that building grows bigger. We want you to come right down to see the appliances demonstrated. Come in and see the beautiful fixtures, domes, chandeliers, fuel appliances, ranges, water heaters, and hundreds of other useful articles that make a home brighter and labor lighter. Won't you sit down right now and drop us a card; or better still — call and see us. Consultations free.

The Consumers' Gas Company, of Toronto

12 and 14 Adelaide St. West. TELEPHONE Main 1933 **Head Office, 19 Toronto St.**

Gas Consumers Increasing in Toronto at the Rate of 20 Per Day.

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

Manufacturing 60 inch pipe for the Low Level Interceptor, Toronto.

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

Write for Illustrated Catalog

ONTARIO AND QUEBEC
Francis Hankin & Co.
Montreal & Toronto

MANITOBA, SASKATCHEWAN AND ALBERTA
F. H. McGavin Company Limited
Winnipeg

BRITISH COLUMBIA
Pacific Lock Joint Pipe Co.
Seattle, Washington

A Chat on Sales

ONE of the important things that you are interested in is information that will enable you to sell more at a lower cost in a better market.

MACLEAN DAILY REPORTS are organized and operated on a plan entirely new in Canada—a plan that will supply you with fresh, dependable, accurate news—telling you DAILY where there are possible buyers, what they want and when they want it.

This information is obtained by our own staff of reporters and correspondents, by personal interview with people in authority.

Our Service tells you about the proposed operation long before the other man knows. It enables you to select from the whole field those opportunities that promise the most profit and which you can handle to the best advantage. It enables you to follow up all sales possibilities persistently and aggressively.

Ask us to tell you what it will cost to keep you informed every day on all the live sales possibilities relating to your business. Ask us to send you specimen reports.

MacLean Daily Reports Limited

220 King St. West
TORONTO ONTARIO

Hercules Waterproofing Compound

Manufactured in
Powder and Liquid Forms
by
The Hercules Waterproof Cement Company
BUFFALO, N. Y., U. S. A.
Distributors in:
Niagara Falls, St. Catharines, Welland, Hamilton, Toronto, Ottawa and Montreal

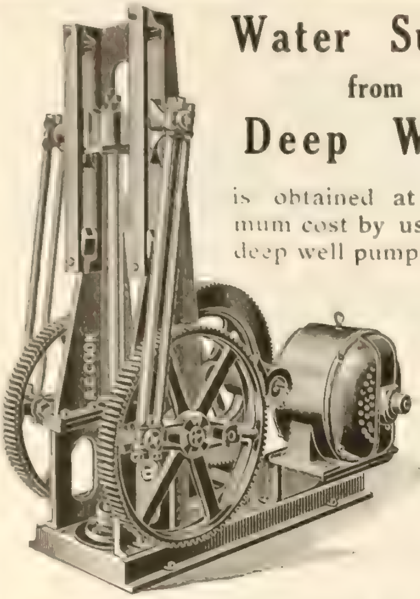
ABSOLUTELY the only Waterproofing Product on the market giving Impermeability with Increased Tensile and Compression Strength to Concrete.

The report of Mr. Peter Gillespie, Lecturer of Applied Mechanics, University of Toronto, shows by the use of 2% Hercules Compound thoroughly mixed with dry Portland Cement before the addition of sand or water, an average Increase in Tensile Strength of over 10% together with Absolute Impermeability, as compared with the same mix of the Portland Cement without the incorporation of Hercules Compound.

While this increase as shown in Mr. Gillespie's laboratory test is very considerable and makes Hercules a factor in all concrete work, the result secured by Engineers on cubes containing a 1:3:5 mix, and made after the manner of the construction work for which they were tested, has shown an increase of from 18 to 25%, together with Absolute Impermeability. CAN YOU BEAT THIS?

Hercules Waterproofing Compound is not an experiment. We can furnish photographs showing work and furnish letters from Engineers, that positively places Hercules Waterproofing and Strengthening Compound in a class by itself.

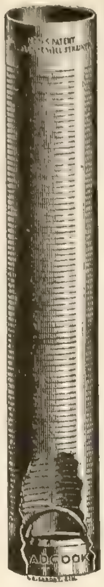
Circulars, Catalogue and General Information cheerfully furnished upon request.



Water Supply from Deep Wells

is obtained at a minimum cost by use of our deep well pumps.

Write for Bulletin 26 explaining the use of Cook's Patent Brass Tube Well Strainer



A. D. COOK

Lawrenceburg, Indiana, U. S. A.

Manufacturer of a Complete line of **DEEP WELL SUPPLIES** including Steam, Belt and Motor Driven **DEEP WELL PUMPS**, Wind-mill and Hand Pumps, Working Barrels and Valves, Pump Rods and Pump Rod Joints, Drill Rods and Drill Rod Joints, Drilling and Well Tools.

CATALOGUE MAILED UPON REQUEST.

Rock Channelers

For Sale

We offer for immediate delivery F. O. B. cars Niagara Falls, Ontario:

Two Sullivan "Z" Channeling machines, latest type, to be run with air, Machines equipped with air reheaters, 30 feet sectional track, and all tools. Full outfit of "Z" or gang bits to cut 12 feet, and stock of repair parts.

These are swivel head machines and have been used only a few months; are in perfect order and can be seen in operation on our work, Queen Victoria Park, Niagara Falls, Canada.

For Photos and Full Information Address:—

Purchasing Agent,

The Ontario Power Company
of Niagara Falls
NIAGARA FALLS, ONTARIO.

Steel Bridges

and Concrete Work

For over a quarter of a century we have been building Steel Highway Bridges throughout Canada.

Our experience is at your disposal.

We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

Get our figures before closing your contracts.

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

SATINETTE

When an Architect specifies Satinette he desires to enhance and protect the beauty of his design

When a Contractor recommends Satinette he shows his good taste

"Satinette"—the enamel that never turns yellow—is the most perfect and durable white enamel ever made.

"Satinette"—is suited for decorative work of every description—Gloss Interior and Flat Interior for interior work and Gloss Exterior for all exterior work.

"Satinette"—is always in evidence where elegance is of primary importance.

"Satinette"—makes an artistic, durable and Sanitary covering for house decoration.

Like all standard products "Satinette is the result of **much thought and experience and is now the most popular enamel finish** on the market.

All Standard Products are sold in full Imperial Measure Can and manufactured by

International Varnish Co., Limited
TORONTO WINNIPEG

WHY IS KITON
Superior to Ordinary Tar?

BECAUSE:

KITON is free from inflamable organic solvents, and therefor far less combustible than tar.

KITON is soluble in water, and in this diluted form can be applied to any surface, whether rough or smooth, hot or cold, wet or dry, as easily as paint. As soon as once dry, **KITON**, like Tar, is absolutely insoluble in water and permanent. Hence its use for

Weather and Waterproofing

KITON will cover a larger area than the same weight of tar.
KITON will do the work better and quicker.
KITON is so easily handled.
KITON needs neither fire nor tarkettle.
KITON will never run, if exposed to the heat of the sun.
KITON will stick positively to any surface.
KITON will take any whitewash, or a finish coat of plaster or cement.
KITON can be coloured.
KITON has none of the drawbacks of tar, but has all of its advantages, and then some.
KITON is cheaper in the long run.

ASK FOR PRICES AND SAMPLE!

F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.

Tenders

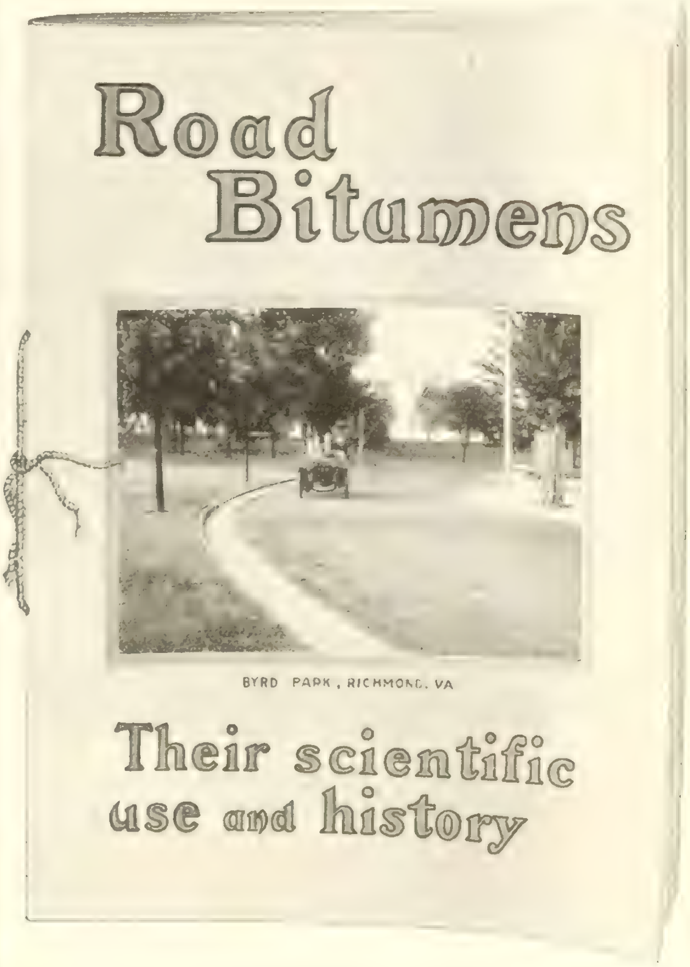
A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 **TORONTO**
Branches: Vancouver and Winnipeg
Montreal



Road Bitumens

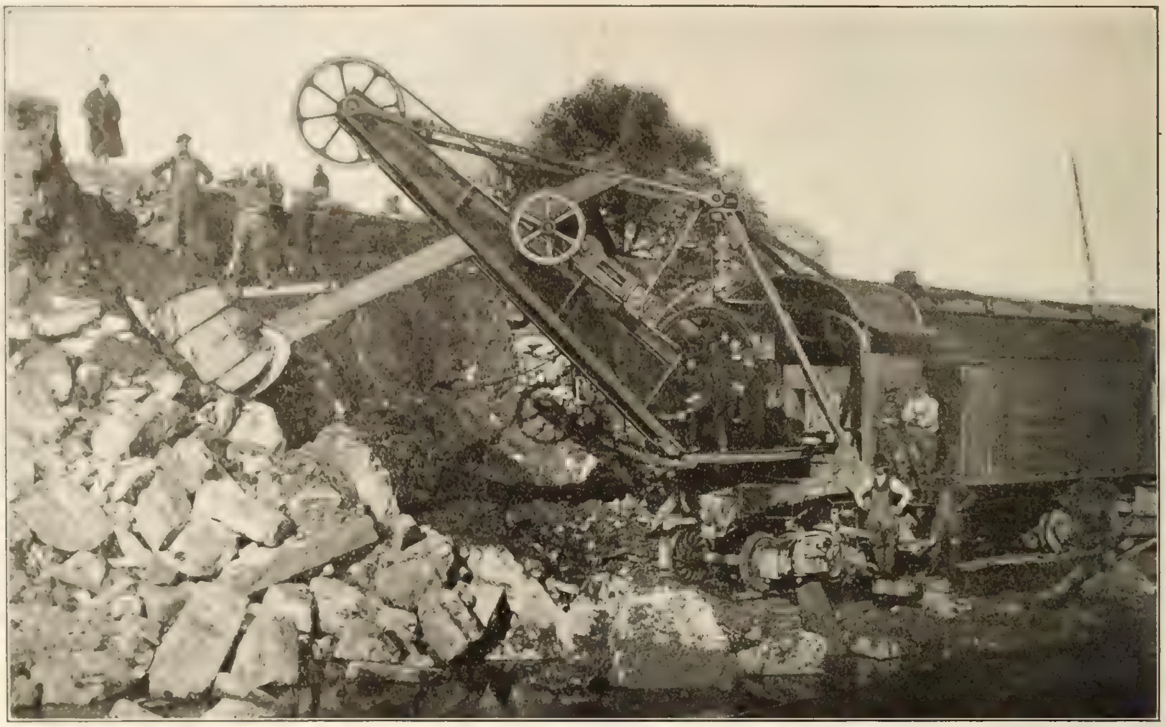
BYRD PARK, RICHMOND, VA

Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a phamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement Company
First National Bank Building
CINCINNATI



CLASS 45 16 2½ ATLANTIC SHOVEL BUILT FOR EDGAR S. & L. W. READE, CONTRACTORS
At work on the construttion of the Canadian Light and Power Company's Canal, at Valleyfield, Quebec, Canada

BUILT BY
MONTREAL LOCOMOTIVE WORKS, LIMITED

Atlantic Steam Shovels are different from other steam shovels. They are built along lines established by experience. They have direct wire rope hoist and a locomotive type of boiler. They are designed and constructed along well tried out principles, and do the most work for the least cost.

WIRE ROPE HOIST

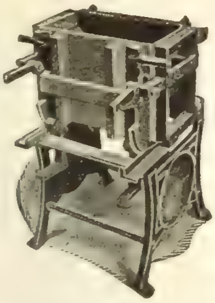
exerts a direct pull on the dipper and substitutes friction of a rope with one sheave for that of a chain with from four to six additional sheaves, greatly increasing the efficiency of the shovel and decreasing cost of maintenance.

Wire rope is safer than chain because it does not break without giving warning. It shows signs of wear by breaking strands and can be replaced at a regular shut down. Chain breaks suddenly, causing suspension of work until it can be repaired.

Behind each Atlantic shovel is the knowledge of requirements in the Contracting field, and the application of this knowledge in using the right materials in the right places.

Every part is made in jigs or to gauges, and every repair part is sure to fit. We are prepared to furnish repair parts at short notice from our works at Longue Pointe, Montreal, Canada.

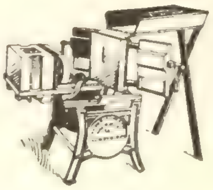
MONTREAL LOCOMOTIVE WORKS, LIMITED
OTTAWA BANK BUILDINGS, MONTREAL, CANADA



London

Face-Down Adjustable

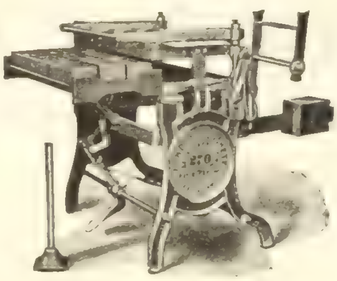
Concrete Block Machine



makes every kind, size and design of block. **All sizes of blocks made** in the **one adjustable mould. All sizes of blocks made** on the **one size pallet.**

Any size core desired can be used which is withdrawn vertically and thus allowing all blocks to be made by the wet process, or with crushed stone in the block. Machine fully **covered by patents.**

SEND FOR CATALOGUE.



London Cement Pressed Brick Machine

Hundreds in operation. Needs no recommend from us. The brick **have frog impression.** The only machine which makes a brick **polished on every side.** Our **self-racking pallet** does away with racks for curing which makes it possible for the contractor to manufacture the **brick on the ground** where the building is to be erected. One man operating makes 5000 brick per day.

Our catalogue tells all about it.

The London Adjustable Sill, Step and Window Cap Mould

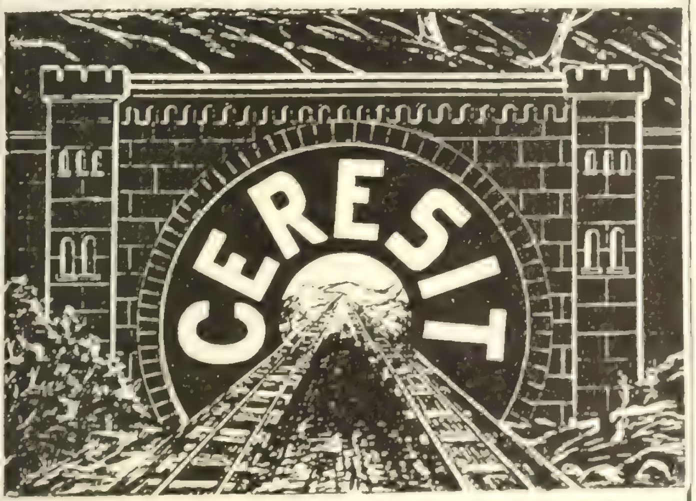
Every Contractor and Manufacturer of Cement Products should know the class of goods that can be produced on this mold. **Can you afford to be without one?** Write for catalogue and learn what this mold will do.

We also manufacture London Standard Drum Batch Mixers in five sizes, London Automatic Batch Concrete Mixers in two sizes, Cement Brick Machines, Face-Down Block Machines. Power Drain Tile Machines, Hand Drain Tile Machines, Silo Curbs, Sewer Pipe Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

London Concrete Machinery, Co., Ltd.

19 Marmora Street, London Canada

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.



No Wet Cellars No Damp Basements

Ceresit is a cream white paste readily dissolvable in water. This water is used instead of plain water for mixing Cement, Mortar or Concrete.

Ceresit Waterproofing Co.

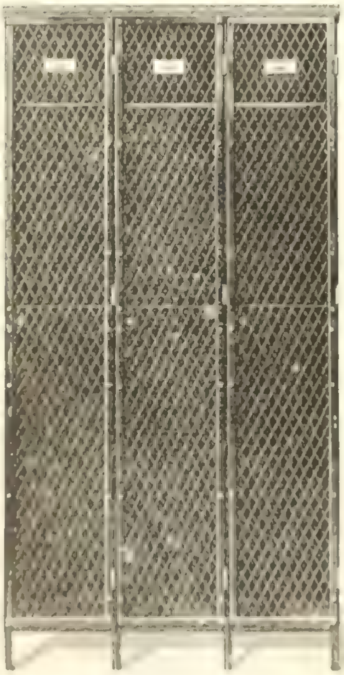
115 Adams Street, Chicago

Canadian Agents

Eadie Douglas, Limited
Montreal, Toronto, Ottawa

Grose & Walker Limited Winnipeg
Dean Thompson, Vancouver

'Meadows' Metal Lockers



Make friends because of their substantial construction and unique features. We make several styles and sizes of these lockers. We'll know what you want if you just hint at your requirements.

Send for our interesting booklet entitled
"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co. Limited
TORONTO, CANADA

STONE BREAKERS

A C M E

THE ACME is the simplest and best Stonebreaker on the market to-day: the movement is essentially a cubing motion, and the sample produced is pronounced the best: the output has never been exceeded on any kind of stone: no power is wasted by unwise and unnecessary complications: the unique action of the operating jaw will take in and break larger pieces than any other STONEBREAKER.

A C M E

Contractors Supplies
of Every Description

Canada Ford Company

485 St. James St.
Montreal

Canada Life Building
Winnipeg

THE STANDARD
COMPANY LIMITED
GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

ALEXANDRA WARE

Bathrooms supplied to the
QUEEN'S HOTEL, - MONTREAL

A beautiful and compact bathroom of the highest grade sanitary ware ever produced.

ALEXANDRA WARE

is manufactured exclusively by the

Standard Ideal Co., Ltd.

PORT HOPE - CANADA

BRANCH OFFICES AND SHOW ROOMS
TORONTO 119 KING STREET EAST
MONTREAL 44 BEAVER HALL HILL
WINNIPEG 76 82 LOMBARD ST

ESTABLISHED 1888

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 May 24, 1911 No. 21

The Toronto Building Code

The memorial relating to the Toronto Building By-law, presented to the Mayor and Board of Control on May 16th, and which was abstracted in our last issue, has been referred to the Fire and Light Committee. The City Architect, Mr. McCallum, states that he is looking carefully into the various sections of the by-law under criticism and that a number of the suggestions made by the committee will undoubtedly be adopted. He thinks, nevertheless, that many of them will be opposed on the ground that they have not received sufficient consideration. Evidence has yet to be shown, according to Mr. McCallum, that the building regulations of Toronto have kept manufacturers away from the city and retarded building operations. He admits that the restrictions on steel and concrete construction are rigid. The regulations were adopted when this form of construction was in the experimental stage and they will probably be modified. The city of Toronto, he says, could not afford to take such chances as Cleveland, where eight people were killed by the collapse of a building of this type.

A Poor Defence

While it was to be expected that Mr. McCallum would rush to the defence of the regulations of his department, it is unfortunate that so many incorrect and misleading statements should have been made public by the City Architect. The character of the published interviews indicate that Mr. McCallum was not unwilling to give the impression that the Citizens' Committee was trying to force flimsy and dangerous construction on the city of Toronto. The following dramatic incident related in a Toronto evening paper is an illustration:

"'Look at this,' said City Architect McCallum, this morning, and he held up a brick which had been broken in two. 'Take hold of it.' Squeezed between one's thumb and finger it crumbled up like mud. 'Material of that kind will not be used in Toronto buildings if I can prevent it,' said Mr. McCallum."

The skill displayed by the City Architect in imparting a wrong impression concerning the proposals of the committee is to be admired, but it might have been better employed. No body of men in the community would be more unwilling to sanction the use of material such as Mr. McCallum exhibited than the members of the Citizens' Committee, and it is sincerely to be regretted that Mr. McCallum should have found it necessary to employ such unfair tactics.

Cleveland Reference Misleading

The City Architect's statement concerning the relative merits of the building regulations of Cleveland and Toronto is also misleading. In the memorial, the committee states that a reinforced concrete building designed in accordance with the Toronto Building By-law would cost 15 per cent. more than if designed to conform to the Cleveland Code, whereupon Mr. McCallum produces an account of the collapse of the Henke reinforced concrete building in Cleveland and asks, "Are those the kind of buildings we want erected in Toronto?" Were this question put to the Citizens' Committee we are of the opinion that every member of it would reply quite as vehemently as Mr. McCallum, "No!" The fallacy in the City Architect's argument is in assuming the collapse of the Henke building was due to the laxity of the Cleveland Building Code. Turning to the report of the expert commission on this disacter we read as follows:

"It is the belief of your Commission that the initial failure was due to the premature removal of forms and supports in the third storey. . . ."

". . . . . the removal or changing of these forms and shores was the one primary cause of the collapse."

"From the evidence submitted, your Commission is satisfied that the reinforced concrete design was a safe one."

There is certainly no indication in these findings that failure was due to the designing of lighter structures in Cleveland than in Toronto, and it is absurd to claim that the building regulations of Cleveland, with respect to reinforced concrete are dangerous because they are somewhat less severe than those of Toronto.

Concerning Reinforced Concrete Work

The contention of Mr. McCallum that reinforced concrete construction requires careful inspection is sound, but this should not necessitate the retention of building regulations which make it impossible to take advantage of the excellence of this form of construction. The proper solution of the difficulty is not in excessively low working stresses and unduly severe assumptions of design, but in the requirement of adequate inspection. Mr. McCallum derides the Cleveland Building Code, but if part of section 473 of that same Code were embodied in the Toronto By-law, it would overcome the difficulty. If this section had been enforced by the Cleveland Inspector of Buildings—and he had every power to enforce it, the Henke building would not have failed. The portion to which we refer is as follows:

When any concrete-steel or armored, reinforced, or trussed concrete is used in construction, the owner shall provide for the inspection of cement and inerts, as required by the Inspector of Buildings; he shall also provide a special inspector of the work who shall be satisfactory at all times to the Inspector of Buildings, and who shall be on the work continually during the mixing and placing of concrete and steel. Such special inspector shall make daily reports to the Inspector of Buildings on the progress of the work.

"Before issuing a permit for the work, the owner shall name in writing the special inspector and such special inspector shall pass such examination as may be required by the Inspector of Buildings to determine his competency."

Concerning Mr. McCallum's contention that the code has not deterred or hindered building, we may have something to say in a later issue. Evidently Mr. McCallum, like the rest of us, has yet a little to learn, and doubtless he will be interested in any information which throws additional light upon this important matter.

Finally, we would urge the Fire and Light Committee to consider the report very carefully so that there may be no mistake as to the necessity for the revision of the code. The defects are many and serious, and a score of them are so flagrant that a school boy could pick them out. This report is not a subject for quibbling and circumvention, and the dilatory methods which characterize the majority of civic proceedings should be set aside for once. As we pointed out in our last issue, a great deal of self-sacrificing work was entailed in the preparation of this report, and having in mind the status of the men who brought it in, it is not altogether to the credit of the city that such misleading statements as we have criticised above should have been made public.

Activity in the Western Field

Prospects and present conditions in connection with building and contracting work throughout the west are quite up to the mark set earlier in the year by even the pronounced optimist. At present writing there is no important element in connection with these industries but presents to those interested a favorable aspect, with the exception of the labor troubles existing in British Columbia. While for the time being these have an unfavorable influence upon the work at some points in that province, it is quite probable that this influence will be only temporary.

The prospects in regard to the volume of building are probably unparalleled in the history of the west. With a uniformity that, applied to any other phase would be monotonous, advices from western cities and towns tell of increasing activity in building projects with the indications of a still greater volume in the near future.

It could scarcely be said that activity is marked in any particular line; rather it might be said to extend to all lines from cottages in country districts to town halls and government buildings. Great activity in the way of water and sewerage systems and other civic improvements is a feature of the situation.

Calgary is the centre of a great wave of building activity. The extent of this may be judged from the fact that the volume of permits issued in April considerably exceed the million dollar mark. Winnipeg building operations were somewhat less in money value during April, 1911, than in the corresponding month of 1910. This condition was due entirely to the uncertainty which existed as to the course to be pursued by the bricklayers when their agreement with the builders expired on the first of May. That this influence was felt principally by the promoters of large projects is shown by the fact that the number of permits issued at the Winnipeg office during April, 1911, was practically the same as during April, 1910.

There have been a number of changes in the prices of building materials at Winnipeg. Building stone has advanced from $10 to $11.50 per cord, lime has climbed from 28c. to 32c. per bushel, and sand is also higher in price. The demand for all these lines is very strong, and this circumstance, coupled with the fact that it is hard to get quarry and kiln laborers, has caused a scarcity and a consequent increase in price.

Canadian Nationality, British Connection and Fiscal Independence

In these days, when any assertion of national feeling is regarded more or less in the light of jingoism, it is quite refreshing to read the frank admission of the Canadian National League—that the basis upon which it has been formed is Canadian Nationality, British Connection and Fiscal Independence.

Our attention to the work of the League is attracted by the receipt of a pamphlet, the contents of which we have perused with considerable interest.

The Canadian National League believes that the principles underlying the proposed pact are utterly inconsistent with those by which the affairs of the country have been conducted successfully for years past. The pamphlets issued by the League will contain accurate and non-partisan information upon the questions involved, the idea being that the surest way to defeat the agreement lies in the array of indisputable facts and statistics which are so readily obtainable. The Canadian National League wishes to show the people of Canada that Toronto at least is the headquarters of an enthusiastic, substantial and national-thinking body of men who are convinced that the president of the United States never made a greater mistake in his life than when he informed Congress that Canada was "at the parting of the ways."

The Canadian National League is opposed to an agreement which will endanger British connection; it is unwilling to allow considerations of personal gain to govern when Canadian interests are in jeopardy, and it believes that the Dominion has a higher destiny than that of becoming "a business part of the United States," as was prophesied recently by Thomas C. Shotwell, in the New York American.

It might be well to say that the Canadian National League has come into being as the result of opposision to the reciprocity agreement on the part of those hitherto not hostile to the government. The chairman is Z. A. Lash, K.C., LL.D., and the secretary, Arthur Hawkes.

Messrs. Raphael Tuck & Sons, Limited, of London ,Eng., have favored us with an advance copy of the facsimile of His Majesty's Letter to the Nation, published by them at the King's command, and which is now ready for issue to the public. The letter is reproduced in various forms, ranging in price from 25 cents to $15, and may be procured through all stationers and booksellers throughout the Empire. The facsimile letter is contained within a beautiful emblematic border designed by Sir Lawrence Alma Tadema, R.A., the original of which is exhibited in this year's Royal Academy.

Publicity for Brick

In our issue of May 3 we illustrated a display of front and ornamental brick seen in the office of a leading manufacturing firm of New York City. The detail shown herewith is a portion of the same exhibit and is an example of formal interior decoration, showing a combination of rough surfaced, glazed and polychrome enamel brick and raked mortar joints.

Concerning the value of the brick display we had something to say in the former issue, but we would again emphasize the fact that the manufacturer who can demonstrate most convincingly the advantage of his particular product usually gets the contract. The architect may have an idea that he would like to use a combination of colors, or he may wish to combine architectural terra cotta with limestone and front brick. Often he cannot work these out in his own mind and the opportunity for seeing the finished brick en masse is a great advantage. Indeed, he has no other proof that the company can actually turn out the shade he wants.

An effective display of front and ornamental brick

Here in Canada, with the present imperfect organization of the clay interests, we cannot hope to do anything on the elaborate lines laid down in cities like Chicago or New York, but nevertheless, much could be done that remains undone. We neither hear enough nor see enough of the possibilities of brick. The blame for this must be laid largely at the doors of the industry itself, which in the past has shown very little enterprise in the moulding of public taste.

The brick manufacturer will often tell you that people know what brick is and that the industry does not need publicity. That such statements are fallacious is proven by innumerable instances from other fields. Just as surely as competition is the life of trade, so is publicity a vital consideration among the things that make for success in business. The trade customs and traditions of the Canadian brick industry—with one or two well-known exceptions—are stale and unprofitable, and there is room for something like a revolution in the selling methods which have prevailed in the past. Brick has three outstanding virtues—economy, permanency and artistic possibility, and these are not appreciated as they should be by the building interests of Canada.

Contractors' Field Force

The field force of the Aberthaw Construction Company, of Boston, Mass., is organized with the object of keeping the home office in daily contact with the amount and direct cost of all work on all contracts. Each job is directly in charge of a general superintendent who reports daily the number of men employed on each class of work, the amount of each man's pay, the class and quantity of work done, and the materials received and used. The superintendent has under him a clerical force, consisting of timekeeper and stock clerks, who distribute the costs among the various classes of work and check all materials received and used; a labor boss, who directs the work of the gang bosses on excavation, concreting and handling materials; a steel boss, in charge of all reinforcing work; a carpenter boss for concrete form work, and a carpenter boss for mill work, putting down floors, etc. The bosses on each class of work are in charge of the several gang bosses of foremen who supervise the labor. All instructions from the home office, owner or architect must be transmitted first to the general superintendent, who is the only person authorized to give orders to the bosses under him. Only in emergencies are directions given to the labor force by persons not their immediate superiors. The policy of the company is to furnish each job with a first-class clerical force, thereby relieving the home office of as much detail work as possible. This also makes it easy to charge the time of the clerks to the job where they are actually working and enables the company to conduct a large business with a comparatively small home office force so that overhead charges are light when work is slack. On the payrolls the only work of the home office is the checking of the extensions and putting the money in envelopes ready for shipment. The payroll is sent to the home office every Thursday night and the money shipped to reach the job Saturday.

Improved methods for handling brick on the yard are quite the order of the day now, but so far as known there is not offered any improvement for laying brick that gives promise of reducing the cost of construction.

There are two valuable possessions which no search warrant can get at, which no execution can take away, and which no reverse of fortune can destroy; they are what a man puts into his brain, knowledge; and into his hand, skill.

A Noteworthy Piece of Foundation Work

Encountered in the Construction of the Dominion Express Building, Montreal
Methods Employed by the Contractors, the Foundation Company, Limited

Possibly the most interesting and difficult piece of foundation work in the city of Montreal, has just been completed in the above job. This building, located on the site of the old St. Lawrence Hall, long a famous hostelry, has a frontage on St. James street of 120 feet, and extends back along St. Francois Xavier street a distance of 95 feet. The design provides for a ten-storey building above the curb, with three floors below the sidewalk level. The deepest basement will be 35 feet below the St. James street curb. At that level will be located the boiler plant, refrigerating machinery, etc.

The building will be of steel skeleton construction, fireproof throughout, with floors and walls supported by the steel superstructure. The total weight of the structure itself, plus the weight of its contents, neglecting the stresses due to wind pressure, is estimated at about 18,500 tons, all of which will be carried by 42 main columns resting on 42 pneumatic caissons, sunk through water, quicksand, coarse sand, gravel and boulders to the greatest depth of any building in Montreal, viz., approximately 90 feet below St. James street.

Foundations for the Dominion Express Building, Montreal.—Sinking the Pneumatic Caissons.

In the construction of tall office buildings in Montreal, many interesting foundation problems arise. The soil overlying the rock varies widely in its nature and also in its depth to rock. In the past, buildings of few storeys in height, with the consequent light loading on the soil, gave but little trouble. Now, with the great advance in real estate values, the tall building erected for the sake of the return on the investment to the owner, is beginning to make its appearance everywhere. Hence the frequent serious foundation problem. The variety of these foundation problems arises, principally, from the character of the soil encountered. In some parts of the city hard clay overlying rock is found, in others, a very soft clay of considerable depth, while again in other localities, quicksand and water bearing gravel.

To make it clear how it has been possible to expose the rock found at great depths below water level, it may be well to describe briefly the method used in sinking the caissons for the Dominion Express and high buildings in other cities. The caissons are simply air-tight bottomless boxes, rectangular or cylindrical in cross-section, having interior chambers large enough for a gang of men to enter and excavate at the bottom. In the roof of the box is an opening from which a shaft communicates with the ground level and of a size sufficient for the conveyance of men and material. Compressed air is pumped into the caisson as it sinks below the water line, to expel the water from the open lower or cutting edge. The caisson is thus sunk by undermining, aided by the heavy weight of concrete which is added over the roof of the caisson as the latter gradually sinks, and also by the addition of pig iron blocks. When it has reached a satisfactory hard stratum, which is cleaned and levelled, the whole interior of the caisson and of the shaft, connecting the working chamber with the outer air, is filled with well-rammed concrete, forming a solid monolith, upon which the superstructure is supported. To permit the passing of men and material from the outside air to the working chamber, or vice versa, without excessive loss of compressed air, an air lock or intermediate stage between the atmosphere and the high pressure, is used. This air lock surmounts the top of the shaft leading to the working-chamber, and it is now possible to sink caissons through quicksand and water close enough to adjoining buildings without causing a flow of material from under the latter, which if allowed to occur might settle and crack them.

Preliminary borings had been made by the architect for the building. Based upon these and the column loads, the building was designed to have 42 caissons, 6 ft. 6 in. in diameter, carried down to rock, a distance of approximately 90 feet below the St. James street sidewalk level. Inasmuch as the lot had been previously excavated to a distance of from 19 ft. to 30 ft., the actual sinking of the caissons was from 60 ft. to 71 ft. To hold back the water and quicksand at such depths when sinking the caissons, it was necessary to introduce compressed air at a pressure, which just before landing caissons on rock reached a maximum of 27 lbs., or nearly two atmospheres above normal. The "sand hogs" were worked in three shifts of eight hours each, a period of one half hour on each shift being taken for lunch, at which time hot coffee was served by the company to the men in a warm room provided for their use. The regulation and temperature of the air being carefully watched no case of "bends" occurred.

An Interesting Feature of the Contract. Shoring the Royal Bank Building.

Work began on the site of the new building about December 1st and the month was spent in the installation of the boiler plant, compressors, derricks, etc., and building up of the caissons. After the working-chambers were put into position, and the forms set up, the concrete was deposited inside of same to a height of 36 feet. After the first build-up of concrete, the caisson was sunk through the water-bearing ground with the aid of compressed air until the top of the concrete had reached the ground level, when another section of the concrete was built up, and the caisson finally sunk to rock.

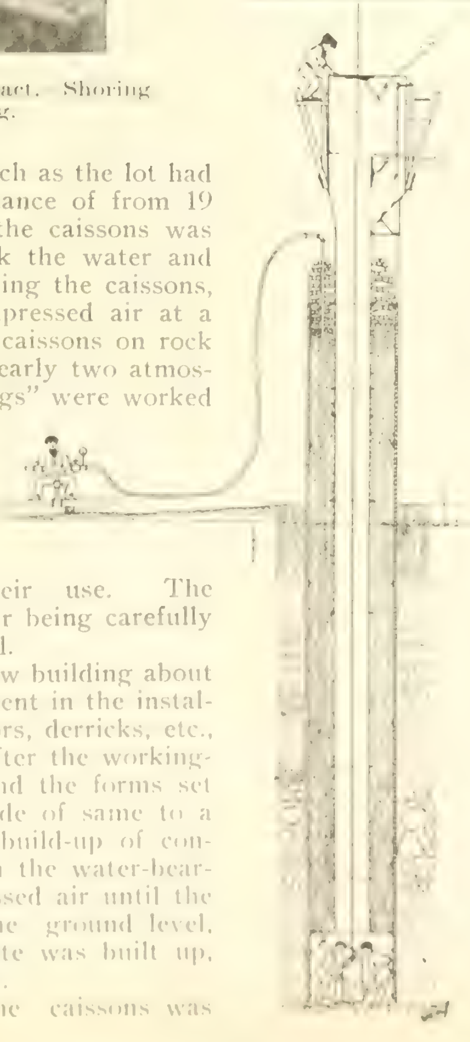
The material excavated from the caissons was hoisted out in cylindrical buckets by means of stiff-leg derricks located so as to command all of the lot. This material was dumped into dirt hoppers by trip lines operated by the signal man on each derrick. From the hoppers the dirt was unloaded by gravity into the wagons in which it was removed from the lot. Inasmuch as the six derricks could excavate faster than these hoppers could take care of the spoil, it was finally found necessary to supplement these hoppers by dumping directly on the street and shovelling into the carts.

To overcome the frictional resistance on the sides of the caissons in sinking same, pig iron to the amount of 350 tons was used in addition to the weight of the concrete itself. The concrete (1:3:5) was mixed in a Ransome mixer and handled in cyclopean buckets by means of the derricks.

One of the interesting features in connection with the work was the shoring of the Royal Bank building which adjoined the site. To preclude any possibility of a settlement of same, this building was taken care of in the following manner: A continuous plate girder 42 in. in depth was bolted to the wall columns of the building for its full length. Against this were long 12-in. x 12-in. Y. P. pushers which were seated on a heavy timber mat in the lot parallel to wall and also running the full length of the building. Daily readings were taken with a level and adjustments made by wedging the pushers off the mat.

The work was executed by The Foundation Company, Bank of Ottawa Building, Montreal, Edw. & W. S. Maxwell being the architects.

The following was the plant used on the job:—



On the left, Typical Cassion; on the right, Caisson "Lock" a chamber between the atmosphere and high pressure in the Caisson.

One 100 h.p. Oil City boiler; one 80 h.p. Kewannee boiler, one 75 h.p. Nagle boiler, one 70 h.p. vertical boiler, two 20 h.p. vertical boilers, one pipe threading machine, six 5 ton stiff leg derricks, four air locks, four ¾ yd. Cyclopean buckets, four caisson dirt buckets, four caisson concrete buckets, two Ingersoll compressors, each 22-in. x 26¼ x 24; one Rand compressor, 14 x 19 x 22; one Beatty feed water heater, one air receiver, one after cooler, six double drum hoisting engines, one Ransome concrete mixer, two 1-yd. Stubener dirt buckets.

The Integrity of Contractors

A few years ago there were rumors that dishonest methods were used in awarding contracts and carrying them out in connection with the work on a large American railroad. At that time that company had spent millions of dollars in practically rebuilding its lines and all of this work had been done by contractors as the railroad company had learned by experience that this is the cheapest method of doing work. The board of directors of the railroad company appointed a committee to investigate all graft and collusion in connection with their construction operations.

The variety of work done was great and the amount was enormous, covering numerous contracts, many of them for half a million dollars and some for even more than a million dollars. The committee investigated all of these contracts, the manner in which they were let, as well as how they were carried out.

After a full investigation the committee reported that there was not a case of dishonesty, not even the giving of small presents and gifts by contractors to employees of the road; and in every case they reported that the best interests of the road had been served by the contracts made and the work done under them. This is a remarkable statement, when it is considered that this one company had spent about one hundred million dollars.

The charges of dishonesty and corruption which the daily papers are so fond of laying at the doors of contractors inspire the "Contractor," of Chicago, with an editorial in a recent issue.

Contractors as a class do not claim to be saints, says our contemporary, but they are honest, if not more so than most business men. Moving from place to place and handling, as they do, large sums of money, it is seldom one hears of a contractor absconding and beating his creditors. On the other hand we know of many cases, when contracts were not profitable ones, of contractors, doing business as corporations, bankrupting themselves individually to meet the obligation of their companies. We feel that contractors have never failed with money in their pockets.

Contractors, as a rule, stick too long to losing contracts. In most cases they are the injured party and they would be justified in abandoning the work, but you seldom find a contractor who will take such a course.

Contractors, sometimes, in carrying on their work, resort to practices that are to be condemned, but in most cases this is caused by unfair specifications and an unreasonable engineer. Thus the contractor, who has his capital at stake, is put on the defensive and it is but human nature for anyone to take care of himself under such conditions.

A large number of contractors make money, but few of them amass large fortunes and die leaving vast wealth. Their financial resources are generally overestimated, so it is rather ridiculous to state that contractors quickly make fortunes by graft. It cannot be stated too emphatically that a fair contract and equitable specifications, together with intelligent inspection, go a long ways towards making an honest contractor.

Re-rolled Steel for Concrete Reinforcement

A prejudice, which has long been entertained, is that against reinforcing bars, which are rolled from old material. These bars, commonly rolled from old rails, have a high carbon content. A finding of interest to makers and users of such bars is that of the committee which was appointed in Cleveland recently to examine into and report on the causes of the collapse of the Henke building in that city on November 22, 1910. The main cause for the collapse of this building, a four-storey and basement reinforced concrete structure, was given as the condition of the concrete, which had not been given sufficien time to set before being subjected to the weight of the building. Although not included in the official report, members of the committee, when interviewed, stated that the reinforcing bars used in the building, while bent and greatly distorted as a result of the collapse, showed only a minimum amount of breakage. The bars which were used in this building were high-carbon re-rolled from old rails.

These high-carbon re-rolled bars are hot-twisted, and not cold-twisted, as is usually the case. Numerous tests made by inspection bureaus show that re-rolled high carbon bars of average size develop a tensile strength of from 80,000 to 95,000 lb. and an elastic limit of 50,000 to 65,000 lb. per square inch, combined with a ductility which will permit bending through 180 degrees to the arc of a circle of which the diameter is equal to three times the diameter of the specimen tested. These figures exceed those generally required by engineers for concrete reinforcing purposes.

Mechanical Shaker for Cement

A mechanical shaker for cement and sand sieves at the testing laboratory of the Intercepting Sewer Board, Syracuse, N.Y., consists of an old sewing machine rigged up to transmit a reciprocating motion to a wooden tray. The machine is driven by a belt from a small water motor, connected to a nearby tap, the spent water flowing into the sink. The tray on which the sieve and its collecting pan are placed contains a circular depression of slightly greater diameter than that of the sieves and around the edge of the hole are set soft rubber buffers so that when the apparatus is in operation the sieve is shaken well and at the same time rotated.

Excellent progress is being made on the extensions and improvements to the plant of the Dominion Steel Company, at Sydney, C.B. During the past year the company has completed 120 coke ovens at a cost of $1,300,000. With a new repair shop and office building the total expenditure will reach $4,000,000.

Concerning Gypsum and Gypsum Products

Value and Progress of the Industry Plaster Boards, Gypsum Studding, Hardwall Plaster, etc., as Modern Fireproofing Materials

By W. H. Price

In the modern better class of building construction gypsum products are playing a very important part, and as a result the gypsum industry has enjoyed a remarkable increase in business during the past few years.

The importance and value of gypsum and the extent of the industry in this country is realized by comparatively few people—the public generally is very much in ignorance on the subject. Some idea of its magnitude may be gained through the fact that millions of tons of gypsum are now annually made into wall plasters and wall finishes of various types, fireproof partition tile, gypsum fireproof studding, plaster boards, plaster of Paris, casting and moulding plasters, dental plasters, wall coatings, stucco, staff, etc., the manufacture of each product requiring a special process. Portland cement contains about two per cent. of gypsum, and gypsum is also used extensively by plate glass manufacturers; the latter requiring the material in the form of a quick setting stucco.

Gypsum products are rapidly relegating old-fashioned methods of wall construction. Plaster board is taking the place of wood lath; and gypsum wall plaster has supplanted lime mortar in the better class of buildings. This condition, however, is natural when we take into consideration the fact that gypsum is a fireproof material and a big time saving factor. When made into plaster board gypsum represents one of the best and most economical insulators against fire, heat and cold—advantages impossible to secure with former methods, and when plastered over with gypsum plaster, on account of the affinity between the products, the board and plaster become a solid mass forming a dense, strong, durable wall. The walls made of gypsum materials in this manner are coldproof and heatproof, making the building more comfortable both during hot or cold weather. Then again, gypsum, either in plaster or in the plaster board, does not contract or expand; thus marring the walls by cracks, pops, and stains, the common troubles of old wall methods.

Lime mortar and wood lath belong to the materials of yesterday, and the fact that they represent only firetrap construction is being discovered rapidly by both builders and tenants. In this day of progress it is not an infrequent occurrence for prospective purchasers or tenants to inspect the walls of the building, as no one who knows the value of plaster board and hard plaster wants to live in a house with walls built in the old way, where cracks, pops and spoiled decorations are more or less constant eye sores. The wiser builders of apartments in the larger cities have also discovered this and are specifying plaster board and gypsum plaster, knowing that this makes the building or apartment more desirable to tenants because of the fireproofing, soundproofing and the many other advantages of gypsum products which naturally appeal to prospective home owners

The technical uses of gypsum are manifold. Wherever insulation against heat and cold is desired there gypsum may be found, thus we find the so-called "Asbestos pipe covering" to be 90 per cent. gypsum, the dentists' muffle furnace to be jacketed with gypsum, the cold storage house to have partitions and wall furring of gypsum blocks, etc.

For the purpose of fireproofing, gypsum is used in a number of ways, the most common being plastering on metal lath, plaster board plastered over with gypsum plaster, gypsum tile for partitions, column covering, wall furring, etc., and gypsum studding used in connection with plaster board or metal lath and plastered over with gypsum plaster.

Analyzing the special features of gypsum in general which make the material desirable as fireproofing, it has the following advantages: Low conductivity of heat; low co-efficient of expansion, practically zero; resistance to water under fire conditions; incombustibility; lightness; strength; adaptability or plasticity; and low cost.

Low heat conductivity is an essential point. In partitions heat is not conducted through to set fire to furnishings, etc., on the opposite side. In the protection of structural steel work the steel is protected from the weakening action of heat. Many fires attain a temperature of 2,000 degrees F. At 1,700 degrees F. a steel column can only bear its own weight. Heat penetrates gypsum at such a slow rate that in the fires of ordinary duration the metal would hardly get warm. Tests and experiments have failed to indicate any appreciable expansion of gypsum under heat action.

Gypsum plaster properly applied on metal lath forms strong, substantial fireproofing. The gypsum plaster provides for the fire resisting properties of this form of construction, the metal fabric being used as a base for the plastering and as a strengthening mesh.

Plaster board is too well known as a reliable and satisfactory modern building material to need any extended explanation here. Gypsum plays an important part in the make-up of many forms of plaster board. In thickness of ¼ to ½ inch, composed of calcined gypsum and fibrous material, plaster board has given splendid results as a fire retardant when used for partitiions, ceilings and furring.

The ½-inch board is in the class of high fire retardants and as such is used in buildings of ordinary construction for the fire protection of stairs, etc., being required for this purpose by the building laws of many cities.

In connection with incombustible studs, plaster board makes a fire-resisting partition of high class for use in office buildings, etc., where lightness and sound-proofing are desirable.

An incombustible stud made of calcined gypsum is attaining great popularity, especially in connection with plaster board. This stud is made 3 by 3 inches in 8 to 12 foot lengths, reinforced with two strips of wood, these strips being in the centre of the stud are completely embedded in gypsum concrete.

A partition constructed of these two materials is light in weight, soundproof and affords high fire protection at a cost not very far in excess of wood construction. The studs are handled and erected in the same manner as wooden studding, being generally set on 16-inch centres, but instead of toe-nailing they are fastened at plates, sills and bridging by galvanized sheet metal clips. The plaster board is applied as to ordinary studding, breaking joints every other board horizontally and nailing with galvanized wire nails 1¾inches long with large head. Both the studs and the plaster board are easily cut with the ordinary saw, and with the exception of plastering, this fireproof partition is erected entirely by the carpenter.

Plaster boards have been in use for the past fifteen years. They were primarily designed to take the place of wood lath and as such have played an important part in the building of the country. For general lathing purposes the board is made in thicknesses of ¼ and ⅜ inches, the ¼-inch thickness being in most common use. The size of each board is uniformly 32 by 36 inches. Light in weight, tough and easily applied, it is nailed direct to studding, furring or joists and is plastered over just the same as any other lathing material.

The Proper Application of Plaster Board

There is a right way and a wrong way to use any material and plaster board must be used right in order to obtain the best results. The writer has been a close observer of modern building materials in general and has often heard adverse comment on very meritorious materials because some builder or mechanic happened to have trouble in their use. And thus the sale of a good product is sometimes temporarily injured in a market when the fault is not with the product but entirely due to a wrong application—a misunderstanding as to the proper use of the material.

Plaster board is not a substitue for both lath and plaster as sometimes misunderstood, but is a lathing material only and should be covered with a good coat of gypsum plaster, not less than ½ inch over the face of the board. Improper application of the board or the attempt to get a good job by using a thin coat of plaster often results in dissatisfaction. The proper method of applying plaster board is to break joints every other board horizontally on the walls, which is easily done by starting every other tier with a half board. Joints should be broken on ceilings every other board at right angles with furring or joists.

It is important that the boards be spaced not less than ¼ to 1/3 of an inch apart on all sides, and these spaces or joints should be well filled with gypsum mortar, forming a good key and allowed to set before the base coat is applied. By filling in the joints in this manner the boards are all joined together into a homogeneous mass, forming a solid plastering surface and also preventing any cracking at the joints.

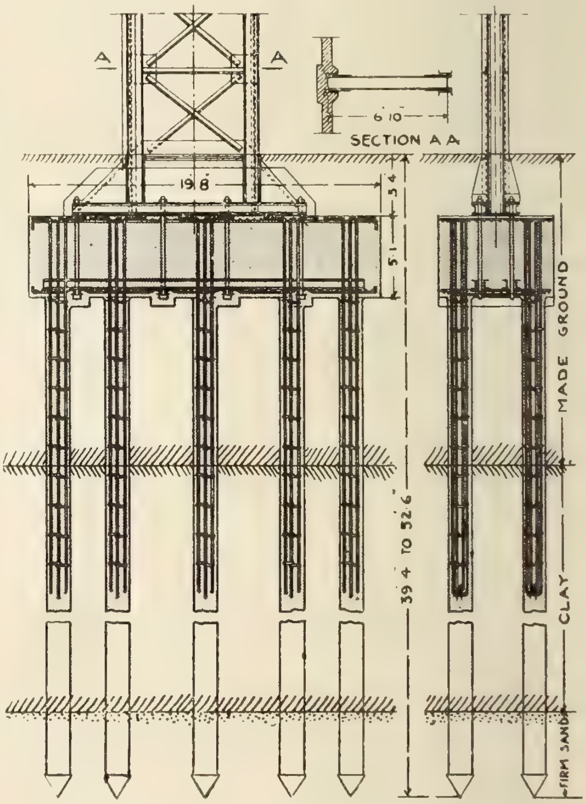
The plaster coat is applied to the dry board and the two materials bond together perfectly. The excessive amount of water required in plastering on wood lath has always been one of the serious objections to that material as this moisture not only warps and buckles the wood lath but also frequently warps the trim and frame work and is often responsible for many of the cracks and other defects in walls and ceilings.

Plaster board absorbs the small amount of excess moisture in the base and finish coats of plaster, keeping the water away from the frame work, and on account of the absence of the wood lath the use of plaster board removes the very element that is largely responsible for plaster cracks, as gypsum either in the board or plaster coat does not contract or expand and is stainproof.

Considering all the good features of gypsum products from a fire-retardant standpoint, its low cost and the extent to which the material is found, it is evident that gypsum will plan an enormous part in the building construction of the country.

Foundations for Engineering Workshops at Hamburg

The new shipbuilding yard of the Vulcan Company at Hamburg includes numerous buildings, one of the most interesting from the architectural standpoint being that devoted to the construction of engines and boilers. These buildings cover an area of more than 61,000 square feet, and consist of bays about 263 feet long by 66 feet wide. Owing to the exposed position of the shops and to the fact that the soil consisted of made ground to the depth of from 16 feet to 20 feet, care was taken in designing the foundations to insure exceptional strength.



Foundations for Workshops at Hamburg.

By the sections reproduced herewith it will be seen that the main columns are provided with an extended base securely bolted down to a massive concrete footing, reinforced by channel bars, the footing being supported partly by the ground and partly by a group of ten reinforced concrete piles driven through made ground and clay to a bed of compact sand at a depth of from 39 feet 4 inches to 52 feet 6 inches below surface level. The whole of the concrete work is in monolithic connection and the construction is further bonded by extension of the vertical bars from the piles to the upper surface of the concrete footing. The flooring of the workshops is formed by reinforced concrete beams and slabs, over which a surface of wood paving is laid.

One of the Smaller Canals in the C. P. R. Irrigation Block

Irrigation Developments at Calgary

Energetic Prosecution of the Canadian Pacific Railway's Great Scheme Constructional Features and Other Details of the System

Reports received from the Canadian Pacific Railway indicate that the company's irrigation operations in the vicinity of Calgary are being pushed forward with great energy. Some thousands of men and teams are employed in the three sections of the irrigation block and the huge system is developing rapidly. In the western section, which comprises 1,039,620 acres, 370,000 acres have been brought under irrigation, and of its total area, both irrigable and non-irrigable, less than five per cent. remains unsold. In the western section 1,600 miles of canals and ditches have been constructed and in addition to this there are several hundred miles of smaller ditches constructed by farmers to distribute the water over their farms. The structures consisting of headgates, spillways, drops, flumes, bridges, weirs, etc., are numbered in thousands, and in their construction ten million feet (board measure) of timber and four thousand cubic yards of reinforced concrete were used. The water for the irrigation of this system is diverted from the Bow river at a point about two miles below the city of Calgary. From there it is carried south and east through a main canal 17 miles in length, 60 feet wide at the bottom and 120 feet wide at the water line, designed to carry water to a depth of 10 feet. This main canal delivers the water to a reservoir, for which a natural depression in the ground has been utilized, and where by the aid of a large earth dam a body of water three miles long, half a mile wide and 40 feet deep had been created. From the reservoir the water is distributed to the land by a system of 250 miles of secondary canals and 1,300 miles of ditches. Altogether in the western section ten million cubic yards of earth have been excavated.

The system to serve the eastern section of the irrigation block is a very extensive one and renders necessary the building of a large number of structures, the details of which are being worked out with all possible care. The section comprises 1,155,224 acres, of which 440,000 are to be rendered irrigable. Most of this land is o a gently rolling character and is susceptible of good drainage. It is the intention of those in charge of the work to make use of reinforced concrete or other permanent material in all important structures. The estimated mileage of canals and ditches to serve this portion of the block is as follows: main canal, 5 miles; secondary canals, 475 miles; distributing ditches, 2,020 miles; total, 2,500 miles.

Main Canal and Head Gates in the C. P. R. Irrigation Block

The earth that it will be necessary to remove in connection with the construction of the above mentioned canals and ditches will amount to over twenty million cubic yards, the whole of which is now under contract. The structures, numbering thousands, will include drops, head gates, siphons, bridges, etc., and to a large extent will be built of reinforced con crete. The largest of these structures will be the big dam at Bassano. (See Contract Record, April 19, 1910.)

The central section of the irrigation block contains 901,737 acres, of which it is proposed to irrigate about 70,000 acres. The preliminary surveys have been completed, and the non-irrigable parts are being disposed of. The irrigable lands in this section will be served through an enlargement of the system already constructed to serve the western section of the block.

Method of Gauging Voids in Sand and Aggregate in Concrete

A simple method of determining the voids in sand and broken stone or gravel for concrete, involves the use of a galvanized dust bin and a weighing machine available up to 500 lb. The procedure is as follows:

(1) Weigh bin empty; denote weight by W.

(2) Weight bin full of water: denote weight by W_1.

(3) Weight bin full of dry sand or aggregate: denote weight by W_2.

(4) Weight bin full of sand or aggregate and water: denote weight by W_3.

Then the cubic contents of bin is: $C = \frac{W_1 - W}{62'4}$

and the volume of voids is. $V = \frac{W_1 - W}{62'4}$

The percentage of voids in the sand or aggregate is:

$$P = \frac{C}{V}$$

The foregoing method, which has been largely adopted by the Aberthaw Construction Company, of Boston, is said to be accurate, convenient and rapid.

Standard Specifications for Tests of Drain Tile and Sewer Pipe

These specifications were recommended by the Engineering Experiment Station of the Iowa State College, and adopted by the Association of Iowa Cement Users, the Iowa Brick and Tile Manufacturers' Association, the Iowa Drainage Association and the Iowa Engineering Society.

Specifications for Standard Absorption Tests

1. **Specimens.**—The specimens shall be each approximately three inches square, and shall extend the full thicknes of the pipe wall, with the outer skins unbroken.

2. **Number of Test Specimens.**—Five individual tests shall constitute a standard test, the average of five, and the result for each specimen, being given in the report of the test.

3. **Drying Specimens.**—Each specimen shall be dried in an oven or by other application of artificial heat, until it ceases to lose further appreciable amounts of moisture when repeatedly weighed.

4. **Brushing Specimens.**—All surfaces of the specimens shall be brushed with a stiff brush before weighing the first time.

5. **Weighing.**—The specimens shall be weighed immediately before immersion, on a balance or scales capable of accurately indicating the weight within one-tenth of one per cent.

6. **Water for Standard Test.**—The water employed in the standard absorption test shall be pure soft water, at the air temperature of a room which is articially heated in cold seasons of the year.

7. **Immersion of Specimens.**—The specimens shall be completely immersed in water for a period of 24 hours.

8. **Re-weighing.**—Immediately upon being removed from the water, the specimens shall be dried by pressing against them a soft cloth or a piece of blotting paper. There shall be no rubbing or brushing of the specimen. The re-weighing shall be done with a balance or scales capable of accurately indicating the weight within one-tenth of one per cent.

9. **Calculation of Result.**—The result of each absorption test shall be calculated by taking the difference between the initial dry weight and the final weight and dividing the remainder by the initial dry weight.

Standard Tests of Bearing Strength

1. **Specimens.**—The specimens shall be unbroken, full sized samples of the pipe to be tested. They shall be carefully selected so as to represent fairly the quality of the pipe.

2. **Number of Specimens.**—Five individual tests shall constitute a standard test, the average of the five and the result for each specimen being given in the report of the test.

3. **Drying.**—The specimens shall be dried by keeping them in a warm, dry room for a period of at least two days prior to the test.

4. **Weighing.**—Each dried specimen shall be weighed on a reliable platform scale just prior to the test.

5. **Bedding of Specimen for Test.**—Each specimen shall be accurately marked, with pencil or crayon lines, in quarters, prior to the test. Specimens shall be carefully bedded above and below in sand for one-fourth of the circumference of the pipe, measured on the middle line of the tile wall. The depth of bedding above and below the tile at the thinnest point shall be equal to one-fourth the diameter of the pipe, measured between the middle lines of the tile walls.

6. **Top Bearing.**—The top bearing frame shall not be allowed to come in contact with the tile or with the test load. The upper surface of the sand in the top bearing shall be carefully covered with a heavy, rigid top bearing, with lower surface a true plane, made of heavy timbers or other rigid material capable of uniformly distributing the test load without any appreciable bending. The test load shall be applied at the exact centre of this top bearing in such a way, either by the use of a spherical bearing, or by the use of two rollers or rods at right angles, as to leave the bearing free to move in both directions. In case the test is made without the use of a machine, and by piling on weight, the weight may be piled directly on a platform resting on the top bearing, provided, however, that the weight does not touch the top frame holding the sand, and provided, further, that the weight is piled in such a way as to insure uniform distribution of the load over the top surface of the sand.

7. **Frames for Top and Bottom Bearings.**—The frames for the top and bottom bearings shall be composed of timbers so heavy as to avoid any appreciable bending by the side pressure of the sand. The frames shall be dressed on their interior surfaces. No frames shall come in contact with the tile during the test. A strip of soft cloth may be attached to the inside of the upper frame on each side along the lower edge to prevent the escape of sand between the frames and the tile.

8. **Sand in Bearings.**—The sand used for bedding the tile at top and bottom shall be washed sand which

has passed a No. 8 screen. It shall be dried by keeping it spread out thin a warm, dry room.

9. Application of Load.—The test load shall be applied gradually and without shock or disturbance of the tile. The application of the load shall be carried on continuously, and the tile shall not be allowed to stand any considerable length of time under a load smaller than the breaking load.

10. Calculation of the Bearing Load.—The total breaking load shall be taken as equal to the total top load ,including the weight of top frame, sand for top bearing, top bearing timbers, etc., plus five-eights of the weight of the pipe. This total load shall be divided by the length of the pipe in feet so as to give the bearing strength per linear foot of pipe.

The modulus of rupture for drain tile and sewer pipe shall be computed from the results of the standard test for bearing strength, according to the following rule:

Divide the bearing strength per linear foot by 12, multiply the quotient by the radius of the middle line of the tile wall expressed in inches, and divide this product by the square of the minimum thickness of the tile wall at top or bottom, also expressed in inches. This quotient will be the modulus of rupture of the pipe expressed in pounds per square inch.

The Development of Bridge Construction

Influence of Public Opinion on Current Design—Progress Made in the Use of Concrete—Notes on Arch Analysis

By Frank P. McKibben

Never before in the history of bridge engineering has the influence of public opinion been so noticeable as at the present time and the interest shown by the public in this important branch of construction is very gratifying, especially to those engineers who have labored unceasingly to have bridges regarded from the artistic as well as from the utilitarian standpint. Public opinion is now demanding not only that bridges shall be made better but that they shall be more suited to and expressive of their purposes and environments. Although great advances have been made in the status of bridge engineering there is still room for improvement, for it is often impossible to make communities realize that a bridge is something more than merely a means of crossing an opening. They are not willing to make the additional appropriations necessary to secure artistic bridges, even though the structures may occupy such conspicuous positions as to require more impressive and finer treatment than some public buildings upon which vast sums are expended to secure pleasing architectural effect. How common it is to see post office buildings, for example, beautifully designed and well constructed, but placed in such surroundings as to lose the intended effect, while nearby may be a bridge in a location of magnificent possibilities, but upon which no attempt has been made to display grace or beauty. Let the public fully realize that when a bridge is built without making it architecturally beautiful a splendid opportunity for civic improvement is lost. In the past the one great difficulty in securing pleasing structures has been that appropriations for bridges have generally been so small as to exclude all but the more utilitarian requirements, but fortunately more recent awakenings of civic pride are resulting in great improvements.

A beautiful arch bridge is a wonderful structure. There is something inspiring about it. And engineers must do all in their power to have the public realize this and to appreciate the beauties that can be created by proper and simple combinations of common materials of construction. Symmetry, grace, simplicity and truthfulness are essential elements in a bridge possessing architectural merit. Truth is a basic element, and when one material is disguised to represent another, or when a part is made to appear as if performing a certain function when in reality it is performing quite a different one, the result is a dismal failure.

Strides Made by Concrete

The most remarkable development in bridge construction during the past quarter of a century has been the progress made in the use of concrete, either alone or reinforced with steel. When it is considered that only 22 years ago the first reinforced concrete arch bridge was built in Golden Gate Park at San Francisco, and that from this small span of only 35 feet to the recently constructed arch span of 320 feet in New Zealand, is a tremendous step, it is evident that progress has been truly wonderful. Concrete, like stone, is best suited to resist compressive stresses, and it can be readily molded into any desired form or size, and it is therefore not surprising that when concrete came into use as a bridge material it should have been used in the arch form. It was a comparatively easy change from the stone arch that had been the standard arch form for many centuries to the concrete monolithic or voussoir arch of similar outline. But it was soon realized that concrete in combination with steel has a distinct individuality of its own and hence important changes were made in the form of construction, resulting in the use of lighter structures of more pleasing design and appearance. The constant tendency has been towards the elimination of rebundant material. The use of arch ribs, with the variation in size and shape thereof to conform to different classes of loads, or the use of solid arch rings upon which rest columns or cross walls to support the roadway above, approaches the design so commonly adopted for aches with steel ribs and in this respect represents a decided departure from and improvement upon the solid arch ring with its super imposed earth fill, which was until recently the standard form of masonry arch construction.

The most recent type in reinforced concrete highway bridge construction consists of a flat deck on which the roadway is placed, the deck in turn being supported by columns or cross walls resting on a solid arch ring or upon ribs. These ribs are usually rectangular in cross section, although those of circular form would give a more pleasing appearance, but would be more costly and more difficult to build. Unless the ribs are very wide they should be braced to prevent lateral displacement under stress. Much can be said in favor of this open spandrel construction except for very short spans or for spans of small rise where the old method of placing the roadway on earth filling retained between longitudinal side walls is better. In the absence of such limitations, however, the open spandrel construction results in a great saving of weight of superstructure, with consequent dimunition in size of foundations and often also in a more pleasing design. For railroad bridges the column and rib type has not been adopted, but open spandrels with cross walls on solid arch rings are of frequent occurrence.

Analysis of Arches

Arch analysis—that is, the determination of forces and stresses acting upon and within the arch—is an interesting and beautiful application of mathematics and mechanics, and it is doubtful if in the whole category of engineering design a more enticing field for study can be found. The insertion of three hinges in the arch makes the solution more nearly determinate, and in case of slight settlement of foundations the stresses within the arch ring remain unchanged. In addition to this advantage, hinges relieve the ring from temperature stresses, since as temperature of the arch changes the crown rises or falls with almost perfect freedom. For arches of small rise the advantage of hinges are so notable that their use will undoubtedly become more common, especially if some form be devised which can be economically constructed. For analysis of hingeless arches the elastic form theory should be employed because of temperature stresses which are usually large and which can be computed only by this method.

Little progress can be reported in short span steel bridges, in fact concrete beams or arches are so admirably adapted to short span construction that steel is hardly its own in this field. But for long spans steel easily leads. Great progress is now being made in the manufacture of alloy steels, and the time is not far distant when record breaking spans of steel will be built.

No notable advances have been made recently in the type employed for long steel spans, but many wonderful structures similar to those tried and not found wanting are now being erected. The cantilever and the suspension forms are the two kinds commonly used, although there is also an increasing tendency to employ steel arches of considerable length. The Quebec bridge failure has had the effect of temporarily throwing the cantilever type of truss into some disrepute, but engineers must not let the pendulum swing too far, because the cantilever has certain well defined advantages which should not be completely ignored simply on account of one failure of its truss members. Lamentable as was this failure, it has been the cause of inaugurating a searching investigation into methods of design that are founded upon empirical knowledge, and much good is being derived therefrom. Resulting from the influence which the Quebec bridge failure had upon the engineering world there is a tremendous desire on the part of experimenters to discover new laws underlying the action of structural materials and to verify experimentally methods of design which until recently were accepted as being sufficient for all cases that might arise in practice.

One hesitates to predict what developments science may bring forth in bridge engineering, but it is probable that for the next decade progress will be made along three lines, the perfection and increased use of alloy steels, the production of structural shapes which are free from objectionable details of fabrication, and finally the combination of steel and concrete into a composite structure in which the steel will afford great strength and the concrete will be a protection against corrosion and against other destructive elements.

Concrete Construction in its Relation to Lighting and Heating Efficiency

Two phases of the concrete construction problem which are not often given due emphasis are those of the relation of this building material to the efficiency of lighting and heating a facory building. In discussing the subject of mill building construction at the annual convention of the National Association of Cement Users, Mr. L. C. Watson, of the Aberthaw Construction Company, took occasion to point out the very important bearing which the material of construction has on these two factors.

It is quite usual for owners in order to increase the efficiency of artificial lighting in mills to whiten the ceilings and walls in order to get the maximum reflection. A recent investigation showed that whitening in general held much better on concrete than it does on wood, so that it is possible to get much better reflection after the whitening has been on for some time and therefore requires less artificial light than in the case with mill construction. Of course, with flat slab mushroom type floors there is a further advantage in the lack of beams to obstruct the light.

A Through Reinforced Concrete Arch Bridge

E. A. Gast, deputy county surveyor, Hamilton County, Ohio, describes this unusual type of bridge in the Engineering News. An interesting statement is to the effect that two estimates were made for this bridge, one of steel girder construction, estimate being $11,000, the other of reinforced concrete construction, the estimated cost of which was $8,600. The County Commissioners decided upon the latter. The bridge, which is near Cincinnati, consists of two hingeless reinforced concrete arch ribs, built entirely above the roadway, the thrust being cared for by tension steel in the plane of the floor tied thoroughly around the steel in the ribs. The roadway is suspended from the ribs by nine hangers of reinforced concrete, the steel rods hooked around rib reinforcement above and floor rods below, taking all the stress. Drawings and photographs illustrate the text, which goes into the details of construction and cost.

Cost of Reinforced Concrete Pipe

In a paper before the Indiana Engineering Society, W. P. Moore, city engineer of Mishawaka, Indiana, in describing the reinforced concrete pipe, 36 in. in diameter, which was used for 3,480 lin. ft. of sewer, states that the approximate cost per linear foot, was $4.16. The excavation for the trench was sand and gravel, and the average cut 10 feet. The pipe was furnished to the contractor by the Jackson Concrete Pipe Company at a cost of $1.80 per linear foot, and the charges per foot for labor and material for joints were: labor,$2.25; cement, sand and gravel for joints, 9 cents; water for flushing trench, 2 cents.

New Type of Bridge

"Tubular architrave" is the type of concrete bridge invented by John A. Lynch, a civil engineer at Spokane, Wash., who has just received advice from Washington, D.C., that the United States patent has been granted. The invention is the result of three years' work. Patents have been applied for in Canada, England, France, Germany, Austria-Hungary, Russia and other countries. A company capitalized at $500,000, is being organized in Spokane.

C. P. Bohland, bridge expert on the staff of the Great Northern Railway Company, who examined the plans and models recently, gives these points of advantage to the new structure over the present type of steel and concrete bridges:

"Saves enormous volumes of concrete as compared with concrete bridges of all other types; cost of construction reduced by the use of sliding form; owing to design a more permanent and a stronger structure is obtainable; cost of maintenance is less, being built on cantilever principles; the cost of placing false work is reduced; excels steel structures in moist of mountainous climates by reason of saving cost of occasional painting and deterioration of structure; for railroad use the ties will lay on a ballast which takes up all vibrations, thus eliminating the crystallization which would otherwise take place in the steel and reinforced concrete; concrete is least affected by variations in temperature; will present an artistic appearance."

A. Palmer, a construction engineer at Spokane, who was one of a party of six experts at a series of tests, thus describes the strength of the Lynch type:

"The advantage is gained by the tubular architrave bridge being made integral and by making same integral, a combination of cantilever and arch effect is obtained in the span, and owing to the advantages in shape and design, being tubular and round, one counteracts the other, thereby transforming what would horizontal thrust to vertical shear.

"The advantages of vertical shear stress over the horizontal thrust is that the live or dead load is taken care of at its immediate location where there is vertical shear, while in horizontal thrust it is transferred throughout the entire structure, thereby making a severe strain on the bridge, especially in case of a live load, such as, for instance, a heavy freight train.

"Another strong feature of the tubular architrave design which can not be obtained in any other design and which is made possible in the tubular architrave bridge because of its being made integral, and in the spring of the arch being round, is that it naturally forms an arch which is arched against the natural arch being held in place by the cantilever effect of the design.

"This effect, which is a special advantage to the design, is obtained by making integral what was once made separate and by changing the shape of same, thereby obtaining a greater amount of strength.

"Another strong advantage which is gained owing to the shape of the design and by the structure being built integral is that owing to the top of the main arch being in the shape of an inverted arch with the ballast placed therein and the load being placed on top of the ballast, the bearing is naturally diverted to the bottom of the fill, thereby lowering the neutral axis in the arch and placing the greater amount of same in compression than could be obtained in any other way."

The test referred to was made with models of the Lynch and the Standard types of concrete bridges. The former had a cross section in the arch of 5 5/16 inches and the latter 10½ inches cross section, Affidavits by six local men who witnessed the test declare that the old style of concrete bridge collapsed under eight sacks of cement, while the tubular architrave bridge collapsed only after 37 full sacks had been heaped upon the arch.

Digging Ditches with Dynamite

The method employed in the use of dynamite for making a small ditch, say three feet deep, four feet wide at the top and one foot at the bottom, is to place a cartridge of powder, 60 per cent. strength, in holes three feet apart, placed in the line of the proposed ditch case, being used to get the cartridge all the way down. About in the middle of the line one hole is selected as the priming charge hole, which is loaded with two or three cartridges of powder, in one of which is placed a blasting cap with fuse attached. When the charge is to be under water waterproof fuse should be used, and after crimping the blasting cap tightly, soap or tallow (not oil) should be smeared on the joint to keep the water from entering the blasting cap and damaging it. The fuse is lighted, the operator retires to a safe place and when the charge explodes the shock of the explosion is communicated to the adjoining charges, which in turn pass it along the whole line of holes, whether the line be straight or curved, exploding practically instantaneously. This method may be used in making ditches up to a thousand feet or more in length. In swampy ground, overgrown with brush and vegetation of all kinds, where a ditching machine would be almost helpless, the dynamite method is practically the only practicable way of digging ditches.

One effect of blasting a ditch with dynamite is to crack up for a considerable distance on each side of the ditch the impervious subsoil which always underlines swampy land, so that the water will drain into the ditch through the crevices. One of the great advantages of a dynamited ditch is that there is no levee along the ditch, no bank higher than the field. The material blasted out of the ditch is spread evenly over the fields and not in a bank along the sides. The surface water from the field can drain directly into the ditch.

A wider ditch or a canal can be dug by loading dynamite into several lines or holes parallel to each other. These holes may be spaced 18 inches to 2 feet apart each way. If a canal 12 feet wide is required, from 6 to 8 rows of holes would be necessary with one cartridge of 50 per cent. or 60 per cent. dynamite at the bottom of each. The priming hole would be placed in the middle hole in the centre line. A canal dug in this manner would probably require a little trimming up as some of the material blasted out would be likely to fall back into the ditch. It would be better not to try to fire too many holes at first, but gaining knowledge and experience as to the charges required, it would be possible to adjust the charges so that no trimming would be necessary.

When this occurs, the ditch can be cleaned out perfectly after it has partly filled with water by [illegible] placing charges of a half cartridge of 50 per cent. or 60 per cent dynamite every two or three feet along the bottom of the ditch under water.

In dry soil it is not always possible to explode a long line of holes with one blasting cap. It then becomes necessary to use an electric fuse in each charge and after connecting up all the fuses with leading wires to a blasting machine, fire electrically. It is, however, comparatively seldom that a ditch is driven through dry ground, and in muck, gumbo and in swampy heavy soil often under water, ditching with dynamite is by far the quickest, easiest and most economical method yet devised.

In Southeastern Missouri, miles of ditches have been dug by dynamite in the past few years, and thousands of acres of land reclaimed thereby.—The Contractor.

Uninformed Critics

Apropos the recent disastrous fire in the Asch building, New York city, as a result of which nearly 150 lives were lost, comments have appeared in the daily press of a character in many instances indicating not only a total lack of knowledge but a regretable tendency to place wholesale blame on the designers of buildings without regard either to facts or figures, says the American Architect.

Among these ignorant and unjust opinions that have found their way into print have been noted several referring to the matter of fire-escapes. A writer in one of the New York dailies sneeringly attributed the loss of life largely to the reluctance of architects to place necessary fire-escapes on the exteriors of buildings because of their marring effect on the architecture of a street. The author then inquires with fine dramatic effect whether architecture or human life is to receive greatest consideration. Of course, comments of this character are, ordinarily made under great stress of mind and should not be taken too seriously, and yet they are liable to create an impression that is as inaccurate as it is unjust. In this particular instance, for example, it has been generally conceded by those who have made a close examination of the premises that exterior fire-escapes as constructed were of practically no value and, moreover, that no possible number would in this case have been of sufficient aid to the occupants of the building to have prevented great loss of life.

However, as to the exterior fire-escape, it is at best but a cheap and inefficient substitute for the fire-tower or fire-escape stairway enclosed in brick walls. It is undeniably one of the most offensive features, architecturally, that can be placed upon a building, but unfortunately even an acceptance of it adds but little to the safety factor. There seems practically no valid reason for its continuance. It is perfectly feasible to construct stair-towers, affording real means of exit and escape in every instance, and at the same time avoid the disfigureing effect of the outside skeleton structure of steel and iron that is neither a part of the building nor an independent construction.

It is true that such a change would probably result in slightly diminished rentable space procurable by the improvement of a given plot, but such a consideration cannot be weighed where the question of adequate protection of life is concerned.

Undoubtedly, the time is not far distant when enactment of law will require the fireproof enclosed stairway or tower, but there is no reason apparent why architects should await such enactment before making adequate provision in their plans for the protection of the lives of those who in all probability will be required to occupy the buildings they are planning. An owner should also feel the moral responsibility which falls upon him and an architect would seem to be derelict in his duty who did not make sure of an owner's full realization of such responsibility.

As we have had occasion to remark previously, means of fire prevention are of even greater importance in certain classes of buildings than means of escape from fire that has been permitted to start. But in every case and notwithstanding every precaution that may have been taken to prevent fire, the fire-exit tower enclosed in fireproof walls affords a measure of safety not to be wisely dispensed with.

Fuel briquets from street rubbish have been experimented with at Amsterdam, Holland. Hitherto the rubbish has been assorted and the paper, rags, metals and glass sold to dealers. The city authorities, according to a recent United States consular report, are now considering converting the street sweepings into combustible briquets for heating boilers. At Southwark, London, the refuse is crushed to a powder and sold as manure. At St. Ouen, France, the power thus made, with the addition of combustible substances, is converted into a cheap fuel. At Amsterdam experiments were made in combining the pulverized rubbish with coal tar from the gas works and pressing into briquets; the results are said to have been successful. The quantity of material available for this purpose is about 140,000 tons yearly. By installing a briquet plant at an estimated cost of $200,000 it is believed that the briquets can be sold at a profit of $20,000.

Seperator for Concrete Wall Shuttering

An ingenious and at the same time very simple type of separator for concrete wall moulds consists of a concrete tube made in standard lengths of 4 in., 5 in., 6 in., and 8 in., each having a ⅞-in. diameter hole from end to end, giving ample clearance for a ⅜-in. bolt, passed through the tube and the timbering on each side. The separators are moulded of good quality concrete, and after the wall has been built they are left in place and become an integral part of the structure. The holes can be allowed to remain open for the support of temporary scaffolding, and afterwards closed by cement mortar. An advantage claimed for the new form of separator, in addition to its general convenience, is that no rust streaks are caused, as is sometimes noticed where iron separators are employed.

Fire broke out recently in the stock room of the E. B. Eddy Company, Hull, Quebec, and burned three million matches. The blaze is supposed to have originated from spontaneous combustion. The room being constructed of cement and being absolutely fireproof, the blaze was allowed to burn itself out.

Principles of Practice for Pile Driving

Adopted by the American Railway Engineering and Maintenance of Way Association—An Enumeration of the Most Approved Methods of Procedure

1. A thorough exploration of the soil by borings, or preliminary test piles, is the most important prerequisite to the design and construction of pile foundations.

2. The cost of exploration is frequently less than that otherwise required merely to revise the plans of the structures involved, without considering the unnecessary cost of the structures due to lack of information.

3. Where adequate exploration is omitted, it may result in the entire loss of the structure, or in greatly increased cost.

4. The proper diameter and length of pile, and the method of driving, depend upon the results of the previous exploration, and the purpose for which they are intended.

5. Where the soil consists wholly or chiefly of sand, the conditions are most favorable to the use of the water jet.

6. In harder soils containing gravel the use of the jet may be advantageous, provided sufficient volume and pressure be provided.

7. In clay it may be economical to bore several holes in the soil with the aid of the jet before driving the pile, thus securing the accurate location of the pile, and its lubrication while being driven.

8. In general the water jet should not be attached to the pile, but handled separately.

9. Two jets will often succeed where one fails, in special cases a third jet extending a part of the depth aids materially in keeping loose the material around the pile.

10. Where the material is of such a porous character that the water from the jets may be dissipated and fail to come up in the immediate vicinity of the pile, the utility of the jet is uncertain, and used to test the final rate of penetration.

11. A steam or drop hammer should be used in connection with the water jet, and used to test the final rate of penetration.

12. The use of the water jet is one of the most effective means of avoiding injury to piles by overdriving.

13. There is danger from overdriving when the hammer begins to bounce. Overdriving is also indicated by the bending, kicking or staggering of the pile.

14. The brooming of the head of a pile dissipates a part, and in some cases all, of the energy due to the fall of the hammer.

15. The weight of the drop or the hammer should be proportioned to the weight of the pile, as well as to the character of the soil penetrated.

16. The steam hammer is more effective than the drop hammer in securing the penetration of a pile without injury, because of the shorter interval between blows.

17. Where shock to surrounding material is apt to prove detrimental to the structure the steam hammer should always be used instead of the drop hammer. This is especially true in the case of sheet piling which is intended to prevent the passage of water. In some cases also, the jet should not be used.

18. In general the resistance of piles penetrating soft material, which depend solely upon skin friction, is materially increased after a period of rest. This period may be as short as fifteen minutes, and rarely exceeds [illegible]

19. In tidal waters, the resistance of a pile driven at low tide is increased at high tide on account of the extra compression of the soil.

20. While a pile penetrates muck or soft, yielding material, and bears upon a hard stratum at its foot, its strength should be determined as a column or beam; omitting the resistance, if any, due to skin friction.

21. Unless the record of previous experience at the same site is available the approximate bearing power may be obtained by loading test piles. The results of loading test piles should be used with caution, unless their condition is fairly comparable with that of the piles in the proposed foundation.

22. In case the piles in a foundation are expected to act as columns the results of loading test piles should not be depended upon unless they are sufficient in number to insure their action in a similar manner, and they are stayed against lateral motion.

23. Before testing the penetration of a pile in soft material where its bearing power depends principally, or wholly, upon skin friction, the pile should be allowed to rest twenty-four hours after driving.

24. Where the resistance of piles depends mainly upon skin friction it is possible to diminish the combined strength, or bearink capacity, of a group of piles by driving additional piles within the same area.

25. Where there is a hard stratum overlying softer material through which the piles are to pass to a firm bearing below, the upper stratum should be removed by dredging or otherwise, provided it would injure the piles to drive through the stratum.

26. Timber piles may be advantageously pointed in some cases to a 4-inch square at the end.

27. Piles should not be pointed when driven into soft material.

28. Shoes should be provided for piles when the driving is very hard, especially in riprap or shale, and should be so constructed as to form an integral part of the pile.

29. The use of a cap is advantageous in distributing the impact of the hammer more uniformly over the head of the pile, as well as to hold it in position during driving.

30. The specification relating to the penetration of a pile should be adapted to the soil which the pile is to penetrate.

31. It is far more important that a proper length of a pile should be put in place without injury than that its penetration should be a specified distance under a given blow, or series of blows.

A monument commemorating the work of Dr. Alexander Graham Bell, inventor of the telephone, will soon be erected in his birthplace, Brantford, Ont. It is expected to have the formal celebration on Dominion Day, 1912.

A roof construction diagram just to hand from the Barrett Manufacturing Company, New York, shows very clearly the increased cost of constructing steep roofs as against those of flat surfaces. It also shows the rise or pitch of roofs in inches and degrees. The reverse side of the diagram contains the Barrett specifications [illegible]

Building Trades Active at Vancouver

Daily Announcements of Important New Work The Wage Schedule
Labor Conditions Satisfactory Progress at North Vancouver

Office of the Contract Record,
Vancouver, May 18, 1911.

The announcement of plans for new and costly buildings is a daily occurrence. Increasing population demands the erection of more and more dwelling houses. Practically whole streets are being built up weekly in the suburban districts. Go where you will you will be in sight of new buildings in course of erection or nearing completion. The season of out-door work is now in full blast. The street car company is laying tracks, hundreds of men are busy on cement pavements, walks and sewers, and the slogan of pro-

The section known as Strathcona is being cleared, and already there are over 100 dwelling houses being built and nearing completion. Lots 50 x 132 sell here for $3,000.

The new building at 28 Hastings street, near Carrall street, will be converted into an hotel by D. Burns, at a cost of $30,000. Extra partitions will enable the installing of 98 bedrooms.

Building at Cedar Cottage is very active and cottages are in big demand. The new $10,000 school house is nearly finished.

Hastings street (east end) between Victoria Drive and Nanaimo street, will be widened at a cost of $43,200.

The borrowing power of the city for public works next year will exceed $7,000,000.

The "Arts and Crafts" building (50 by 120 feet), will be erected on the east side of Seymour street, between Dunsmuir and Seymour streets, at a cost of $70,000, by Marriott & Fellowes, the Norton-Griffiths Steel Construction Company being the contractors. The foundations are for a ten-storey structure, but only four storeys will be put up this year.

Following are the different wage schedules prevailing among the building trades of Vancouver: Carpenters and joiners receive 56¼ cents an hour, or $4.50 a day of eight hours; structural iron workers, 56¼ cents an hour, or $4.50 a day of eight hours; cement workers, 75 cents an hour, or $6 a day of eight hours; electricians, 50 cents an hour, or $4 for eight hours; steam engineers, 50 cents an hour, or $4 a day; elevator constructors, 50 cents an hour or $4 a day; lathers, piece work. Laborers: Plasterers, 50 cents an hour, or $4 a day of eight hours; bricklayers, $3.50 a day; general, $2.80 a day. Painters, 56¼ cents per hour, or $4.50 a day of eight hours; plumbers, $5 a day of eight hours; plasterers, 75 cents an hour, or $6 a day; shingles, piece work; sheet metal workers, 56¼ cents an hour, or $4.50 a day; tile-layers, 68 cents an hour, or $5.50 a day; machinists, 45 cents an hour, or $3.60 a day of eight hours; marble-cutters and stone cutters, 75 cents an hour, or $6 a day; steam engineers (donkey engines), $4.50 a day (after May 1st).

The Saturday half-holiday is universally observed or the 44 hour week in Vancouver.

It may safely be stated that Vancouver is not only a commercial metropolis but is rapidly approaching the status of an industrial centre. It is estimated that the population of Greater Vancouver has increased 25,000 since last year. This would place the present population of the city at 145,000.

Active preparations are being made by the Imperial Car, Ship Building and Dry Dock Corporation, Limited, for the establishment of their new industry. The corporation has no less than 4,800 property lots and a mile and a half of water frontage. It is now spending $50,000 on clearing the land. The proposed shops will cover five acres and will involve an expenditure of over half a million dollars, the details being as follows: car shops and machinery, $350,000; sea wall and grading site, $50,000; construction work, $65,000; engineering and contingencies, $35,000. Between 500 and 600 men will be employed at the works. The company has secured an option on a group of ten claims of valuable iron deposits, located within ten miles of the town sites and shops. It also has a clay deposit which will supply the needs of the town site for many years. The capitalization of the Imperial Car Co. is $20,000,000. Judge Arthur, of Seattle, is president and ex-Mayor Douglas, of Vancouver, vice-president.

The carpenters' strike seems to have petered out. All the union men have to work on other jobs, and their places in many cases have been filled by non-union men,—new arrivals. The reports to the Builders Exchange from large contracting concerns show that they had practically all the men required at $4.25 for eight hours. The rate asked by the union is $4.50. The association of contractors are seeking closer working arrangements with other organizations and interests who have not worked with them in harmony heretofore, so that in future the city may not be affected by the conditions demanded by the unions. Also they have decided not to figure on work where strict clauses are included in the contract, tying their hands as to the employment of labor.

Building Inspector C. N. Jarrett recently received figures from Seattle, Wash., showing that for no month this year had Seattle's building permits exceeded $1,000,000. The returns for the two cities for the four months, Jan.-April, are given as follows: Vancouver, $5,793,650; Seattle, $2,636,890.

Final arrangements have been completed at Ottawa for the government subsidy of $200,000 for the Second Narrows bridge, Vancouver. This structure will be a railway and vehicular traffic bridge, owned jointly by the municipalities of Vancouver and North Vancouver, which have contributed $350,000. The Dominion and Provincial governments have pledged $200,000 each. Construction will proceed at once. The engineers have taken soundings and prepared plans, which will soon be accepted and approved.

It is announced that the Vancouver, Westminster & Yukon Railway Co. will proceed with its connecting railway lines, one on the north shore of Burrard Inlet and the other through Hastings townsite (now the east end of Vancouver city). When completed this railway will be the connecting link between the G. T. P. railway and the Great Northern. Fort George, the G. T. P. junction, is 525 miles northeast of Vancouver. The railroad from this point to North Vancouver will not be constructed until the main line has been completed.

North Vancouver

North Vancouver is progressing apace. The city was incorporated in 1907 with a population of about 1,500; today it has 8,000 inhabitants and is still growing. Among the projects in sight may be mentioned the large sawmill of the North Vancouver Lumber Company and the buildings and plant of McDougall-Jenkins, Limited, which will involve an expenditure of $150,000. Much development work is planned in other industries along the water front.

The city council have decided to spend $750,000 on public works. This will issure much activity in street paving and sewer construction for some time. At present a thousand laborers are employed on sewer work.

According to a dispatch from Edmonton, Alta., construction work has at last been started "on the long-hoped for railway from Edmonton that will tap the far-famed Peace River country, and give transportation facilities to the last free heritage of the Anglo-Saxon race." The contract for 50 miles of the line has been awarded by the C. N .R. to the Northern Construction Company.

Close Figuring at Ottawa, Ont.

Competition for a Good Sized Contract Awarded Last Week—No Labor Troubles—Supply Market Normal

The industrial situation in the Capital got over the first of May without any serious difficulty. The only obstacle that presented itself was with regard to the mason and bricklayers' helpers. When these trades went onto the 8-hour day schedule their assistants were forced to work only eight hours as well. As their agreement with the contractors came to an end on the first of May, they demanded that the rate of pay be raised up from 25 cents to 28 cents an hour. It will be noticed that the 25 cents an hour for a nine-hour day was $2.25, and that the increase to 28 cents for an eight-hour day brings them in $2.24. The wages of the helpers who work nine hours a day remain 25 cents an hour as usual. Carpenters' wages remain the same, from 30 cents to 35 cents an hour, and a few at even lower rates.

Close Figures on a City Contract

Mr. Thomas McLaughlin has been awarded the contract for the West End drainage excavation. The award of this big contract attracted considerable attention. Mr. McLaughlin tendered $62,188 for the excavation, not including the rock. The tender for rock was at $4.75 a cubic yard. The engineers' estimate for the rock was 31,000 cubic yards and thus the total for it was $147,250. Accordingly the total contract was $209,438. Mr. Roderick Brewder tendered entirely in a lump sum for $209,404. This did not fulfil the requirements of the advertisement, which provided that the price for rock should be particularized. Under the circumstances the Board of Control declared the tender irregular. Another feature of the tender of Mr. McLaughlin was the very low price asked for earth excavation and the very high price asked for rock. The Union Construction Company, whose total tender was some $33,000 higher, tendered $165,475 for the earth excavation and only $2.50 per cubic yard for the rock. While Mr. McLaughlin's tender for the rock excavation was $4.75, as compared with the Union Construction's $2.50, yet his price on the earth was so low as to bring his tender well under his competitors' bids. There is therefore a great deal dependent on the accuracy of the estimate on rock made by the City Engineer. If the estimate of rock is high Mr. McLaughlin's tender is correspondingly low, while on the other hand, if it is low, Mr. McLaughlin will get the $4.75 a cubic yard for all in excess of the 31,000 cubic yards. The City Engineer, however, considers that his estimate is low and that therefore it will be the city that will get the long end of the bargain.

The Dominion [illegible] 000 towards the erection of an overhead bridge across the Rideau Canal at Bank street. It is estimated that the entire cost will be about $150,000. A by-law will be submitted to the electorate to decide whether the city will provide the remainder of the money required. It would be a reinforced concrete bridge.

Mr. Hiram Robinson has decided to make his commercial building on Queen street six storeys instead of three, as was first intended. It will be semi-fireproof and will cost about $70,000. James Mather is the architect and Holbrook & Sutherland are the general contractors.

Another large building for which tenders will be called very soon is the big addition to John M. Garland & Sons' warehouse on O'Connor street. This building will be of reinforced concrete and will cost about $45,000. A. Le B. Weeks is the architect.

Tenders will probably be called next week for the large departmental building to be erected by the Government on Mackenzie avenue. The specifications are in the hands of the printers and the plans are practically complete.

Prices of building materials remain very nearly the same. An advance is noted in hardwood flooring of the birch and maple variety. What formerly ranged from $40 to $50 a thousand feet is now being sold for $43 to $55. There is a great demand for this kind of flooring and most of the new residences are up-to-date in this respect.

New Y. M. C. A. at Lethbridge, Alta.

The new Y. M. C. A. building at Lethbridge, Alta., has just been completed by the contractors, Messrs. Smith Bros. & Wilson, of Lethbridge, Regina and Saskatoon. The building is 60 by 100 feet in dimensions and is four storeys high. It is considered the most up-to-date and best equipped building of its kind west of Toronto. It contains a large swimming pool and shower baths, bowling alley, reading rooms, reception rooms, billiard rooms, class rooms and gymnasium. There are 43 dormitories in all. The material used in the construction of the building was Bedford Indiana stone trimmings and No. 1 red pressed Calgary brick throughout for facing. The inside finish is oak and British Columbia coast fir, all finished in the early English style, which, together with the rich burlapping and panel work, is productive of a most artistic appearance. Mr. D. W. F. Nichols, of Winnipeg, was the architect.

The New Y. M. C. A. at Lethbridge, Alta.—Contractors, Smith Bros. & Wilson.

The town of Campbellford has placed an order with the Canadian General Electric for a gas producer generating plant of the following description:—Two Premier gas engines of 172 and 344 h.p., and two gas producers. These to be used with one [illegible] and one [illegible] K.W. A.C. [illegible] phase [illegible] and [illegible] volts. The plant [illegible] delivered and in running order by [illegible]

Canadian City Engineers

M. P. Blair, St. Boniface, Man.

The city engineer of St. Boniface, Man., Mr. M. P. Blair, is a native of Ireland, and was born on February [illegible]. After spending the first seven years of his life in the Emerald Isle, he left the Old World for the New and went to Detroit, where he remained for one year. Afterwards he was educated at the Chicago public schools and high schools, the North Western University and the Lewis Institute, Chicago, also the Wesleyan University of Bloomington, Ill.

His first professional experience was obtained with the Chicago, Milwaukee and St. Paul Railway, by whom he was employed for one year as chainman. Afterwards he was employed for two years by the United States War Department on the Topographical Survey for Deep Water Way between Chicago and St. Louis. On the latter undertaking his work consisted in taking topography for one foot contours, and sounding the Illinois river; he was also in charge of tertiary triangulation and assistant on secondary triangulation. His next experience was obtained in charge of the local improvements at Kennelworth, Ill., where he remained for one year. Afterwards, for two years, he was with the Illinois Central Railway on construction and location in Mississippi, Tennessee, Kentucky and Indiana, attaining the position of resident engineer. For a year he was resident engineer for the C. P. R., and for six months assistant city engineer for the city of St. Boniface. He has been city engineer of that municipality for the last three and a half years.

City Engineer Blair, of St. Boniface, Man.

City Engineer Blair is an associate member of both the Canadian and American Societies of Civil Engineers. He also holds membership in the American Waterworks Association, the National Geographical Society and the Canadian Cement Association.

The John S. Metcalf Company, Limited, have received from the Canadian Pacific Railway Company a contract for about one-third of a mile of wharves at Victoria Harbor, Ont., in addition to the wharf work previously awarded them at that point. The new order is for wooden crib structures below water with reinforced concrete superstructures. This makes the total amount of wharf for which the Canadian Pacific Railway Company have awarded this company contracts at Victoria Harbor, approximately one and one-quarter miles.

Personal News and Notes

Mr. W. J. Francis, of Montreal, arrived at Moose Jaw, where he will furnish a report on the water supply.

Mr. A. Webster has resigned his position as secretary of the Board of Trade at Calgary, and will go into business on his own account in builders' supplies.

Congratulations to Mr. E. H. Keating, of Keating & Breithaupt, Toronto, upon his election as a member of the council of the Institute of Civil Engineers of Great Britain.

The Electric Railways Construction Company has approached the city of Vancouver with a proposition for the joint construction of an electric railway through Stanley Park, about eight miles.

Mr. F. D. Baillairge, city engineer of Quebec, will shortly pay a visit to Toronto to inspect paving work in that city. He will be accompanied by the mayor and the chairman of the roads committee.

The St. Lawrence Bridge Company, of Montreal, who were awarded the contract for the superstructure of the Quebec bridge, are now arranging for the establishment of an assembling plant at the site of operations.

The Alberta Pressed Brick Company, Limited, is Calgary's latest manufacturing concern. Mr. J. F. Farrier, of Bonham, Texas, the company's representative, arrived in the city recently from Vancouver for the purpose of locating a suitable site for the new concern and to superintend the erection of the plant.

Labor disputes are at an end in Calgary this year, an amicable settlement having been reached between the labor unions and the Builders' Exchange. The following wage schedule is in force: bricklayers, 65 cents; carpenters, 50 cents; painters, 45 cents; plumbers and steamfitters, 57 cents. The last named trade has signed up a 2-year agreement and the wage next year will be 60 cents.

Mr. C. C. Schneider, of New York, a former president of the American Society of Civil Engineers, succeeds Mr. Charles Macdonald, of Gananoque, Ont., on the commission of engineers for the Quebec bridge. Mr. Macdonald, it will be remembered, only accepted a place on the commission upon the condition that he be allowed to retire upon the signing of the contract. Under the present constitution of the commission of three, Mr. Monsarrat will be chief engineer in charge of construction, devoting his whole time to the work, and Messrs. Modjeska & Schneider, consulting engineers.

Mr. H. B. Muckleston, who was recently appointed assistant chief engineer of the irrigation department of the C. P. R. at Calgary, is a native of Kingston, Ont. He was educated at Port Hope, Ont., and the Royal Military College, Kingston, from which seminary he graduated as a medallist in June, 1894, taking honors in mathematics, civil engineering, artillery and construction. His early professional experience was obtained with the Westinghouse Electric Company at Pittsburgh, Pa., with whom he remained from 1894 until 1896. In 1897 he engaged as rod-man on the Crow's Nest Railway of the C. P. R. The following year he was leveller on the C. P. R. survey at Vancouver. From 1899 to 1902 he fulfilled the duties of assistant engineer on British Columbia government survey work, afterwards accepting the appointment of resident engineer for the C. P. R. at Revelstoke, B.C. In 1903 he was appointed assistant engineer of the C. P. R. irrigation department at Calgary. Two years later he was appointed division engineer and in 1907 chief division engineer of this department. Quite recently he was appointed assistant chief engineer. Since 1907, the date of his appointment as chief division engineer, he has had charge of practically the whole technical side of the irrigation system, including design, location, surveys and construction.

Acadia Coal Companys' Power Plant at Stellarton, N. S.

The Canadian General Development Company, Limited, of Montreal, has in charge the installation for the Acadia Coal Company at Stellarton, N.S., of an extensive electrical power plant. Work has already been commenced on the central generating station which will have an initial capacity of 3,000 k.w. and an ultimate capacity of 6,000 k.w. Two units of 1,500 k.w. each, are being installed by the Canadian General Electric Company, Limited and the Allgemeine Gesellschaft. These generators wlil be connected with steam turbines. Messrs Babcock & Wilcox, Limited, have the contract for installing boilers, stokers and a coal and ash handling plant.

The installation of the two electrically driven hoisting engines is being studied out and the contracts for these will be placed shortly. The hoisting of coal by means of electric engines will be a new departure in the history of mining engineering in Canada and there are few such installations in America. The compressors, fans, pumps, etc., will all be electrically operated. All the work above described is to be completed this year and the total cost is estimated at about $400,000.

Alexander Allaire, M. E., Montreal

Mr. Alexander Allaire, manager of The Foundation Company, Limited, is of French descent, was born and educated in Brooklyn, N.Y., and is to-day an enthusiastic Canadian. Although only a year a resident of Canada he is greatly impressed with the progressiveness here. What has surprised him most are the possibilities looming up before this young country and the magnitude of the work to be done along manufacturing, construction and other technical lines. Canada, he says, has already reached national greatness and is destined to occupy a still more prominent place in the industrial world.

Mr. Allaire was educated at the Stevens Institute or Technology, Hoboken, N.J., one of the oldest engineering institutions in the United States. "They worked us hard there," he says, looking back over his school days, "but I suppose it was for our good." He graduated from this college as a mechanical engineer in 1901. The next four years were spent in practical, mechanical work in connection with engines, compressors, and other heavy machinery. Two years of this period were spent in the steel works of Pittsburgh, and other large manufacturing centres.

Five years ago after having had a varied experience in construction work, Mr. Allaire joined The Foundation Company in the United States. About half of the directors of that company are Canadians, some of whom went across the line several years ago when business was at a low ebb in this country. Home ties are ever the strongest, and with the return of prosperity at home these gentlemen naturally turned their attention to some promising Canadian contracts that were offering. Being successful with these undertakings it was decided, a little over a year ago, to start an independent Canadian company, which should have the facilities of the American firm and also benefit by its experience. A federal charter was obtained and Mr. Allaire, who ha' been for some time superintendent of The Foundation Company's operations on tunnels, mining shafts, sea walls, water power and caisson work, was selected as manager of the Canadian Company, with offices in the Bank of Ottawa Building, Montreal.

Alexander Allaire, M. E.,
Manager of the Foundation Company, Limited, Montreal.

Among the important works carried out by The Foundation Company, Limited, during the first year of the company's operations, may be mentioned: the foundations for the C. P. R. Windsor Station extension; the foundations for the double tracking of the C. P. R. bridge across the St. Lawrence, between Lachine and Caughnawaga; river piers and towers for the Canadian Light & Power Company in the St. Lawrence; the foundations for the Dominion Express Building; piers in Toronto bay for the Hydro-Electric Commission; and reinforced concrete work for the Queen City Oil Company, of Toronto.

The Edgar Allen American Manganese Steel Company, Chicago, Ill., have sent us a pamphlet containing an enumeration of the various kinds of manganese steel castings manufactured at their works at Chicago Heights, Ill., and New Castle, Delaware. We are also indebted to this firm for an informative booklet entitled, "Manganese Steel and its Application to Ceramic Industries," this being a paper read before the 25th annual convention of the National Brick Manufacturers' Association of Louisville, Ky., by Mr. G. W. Kneisly, of the Edgar Allen Company.

Mr. Geo. H. Lang, of the architectural firm of Lang & Major, Calgary, Alta., returned recently to that city after a business trip extending as far east as Chicago.

Our Vancouver correspondent informs us that the London company which is to build a dry dock at [illegible] for the Vancouver Dry Dock & Shipbuilding Company has increased its capitalization $1,500,000. The contract for the construction of the big dry dock has been let to a Newcastle-on-Tyne firm, who will ship it in sections to British Columbia.

A Story of Progress from the Queen City

The Early History and Subsequent Development of the John Inglis Company's Business - A brief description of the present plant

Industrial development in the city of Toronto has been so rapid in every department of trade during recent years that it requires something almost phenomenal in the way of progress to attract more than passing attention. The records of the past may not always hold good in this competitive age, however, and there must be occasions when it is interesting, and at the same time profitable, to study surpassing achievement. While every industry is having a fair share in the upbuilding of the Dominion, we cannot but reflect—and it is a stimulating thought—that the "Contract Record" is serving the interests of those practical, progressive men who constitute the very backbone of this Canada of ours. Without dealing further in generalities, however, we will turn to an outstanding example of progress and to a firm whose name is a synonym for "Standard" in the various lines in which it is engaged: the John Inglis Company, Limited, of 14 Strachan avenue, Toronto.

A detailed description of these various lines would provide us with sufficient copy for several issues; indeed it would be superfluous at that, for the trade from the Atlantic to the Pacific has become well versed in the pumping machinery, power engines, marine engines, boilers, penstocks, heavy plate work, air compressors, hydraulic machinery and many other lines bearing the stamp of the Inglis concern.

The business of the John Inglis Company was established in Guelph, Ont., more than half a century ago, by the late Mr. John Inglis. It was carried on under his direction and with several partners until the year 1881, when the firm removed to Toronto, where they acquired extensive property on Strachan avenue, the location of their present works. The firm was known at this date (1881) as Inglis & Hunter. With the retirement of Mr. Hunter in 1889 the style of the firm was changed to John Inglis & Sons. In 1903 the company was incorporated as The John Inglis Company, Limited.

The active directors are Mr. Inglis, president, and Mr. Campbell Reaves, vice-president and secretary-treasurer. Mr. Reaves became identified with the firm in 1901. The progress made by the company in recent years is sufficient proof of the enterprise and executive ability of those at the helm.

Since obtaining their charter the company have devoted themselves systematically to the extension of their plant and the development of their business. The present capacity of their works and the facilities provided, together with the wide market that has been found for the Company's products, attest their success in both particulars.

Boiler Shop at the Works of the John Inglis Company, Limited. This building is replete with the most Modern Equipment and is 400 by 70 feet in dimension. It is especially adapted for the Heavier Class of Work.

The accompanying views of the plant convey an altogether inadequate idea of the resources of the John Inglis Company and a few brief particulars may be of interest.

The first addition to the plant was a steel and brick boiler shop 200 feet long. This building had not been completed a year before it was found necessary to build an extension of 100 feet, to take care of the increased business in this department. The building was again enlarged in 1908 and the shop is now 400 feet long. It is fully equipped with cranes and modern tools of every description and is especially adapted for heavy work.

The machine shop, which is 200 feet by 100 feet, is of steel and brick construction, and was completed in 1909.

A section of the Machine Shop at the Works of the John Inglis Company, Limited.

It is equipped with electric cranes and is replete with modern tools of all kinds. This shop is excellently adapted for the manufacture of the Inglis Company's specialties and is considered one of the most up-to-date on the continent.

In addition to these buildings a new pattern shop, storage, blacksmith shop and boiler plant have been built in the last three years, so that all of the plant acquired by the present company has been rebuilt with the exception of the foundry, plans for which are now under consideration.

During the last ten years there have been noteworthy changes in the product of the firm. In the engine department, pumping machinery, heavy type and marine engines have been substituted for the lighter Corliss engines and mill machinery. And in the boiler branch of the business a line of penstocks, heavy tanks and furnace work has been added to the regular boiler business previously carried on by the company.

Among the most recent orders completed in the machine shop are a fifteen million Imperial gallon pumping engine for the city of Toronto (a description of which we hope to publish in a later issue); a six million Imperial gallon pumping engine of similar design for the city of Edmonton,

Another view of the Machine Shop, conveying some idea of the Modern Equipment of which the John Inglis Company make a Feature in all Departments.

Wheel Casing under construction.

and the engines and machinery complete for the steamer "Rapids Prince," built for the Richelieu & Ontario Navigation Co.

In the boiler shop, while boiler work has been plentiful, the larger contracts have been with the power development companies. Penstocks, wheel casings, etc., have been furnished recently for the Canadian Niagara Power Co., the Canadian Light & Power Co., and the Ontario Power Co. Similar contracts have also been made for the Shawinigan and Kamanistiquia power developments.

From the brief particulars we have given above it will be seen that so far as plant and equipment are concerned the company are in a position to obtain the very best results in the manufacture of their various lines, which we have already enumerated in part. Concerning the management it need hardly be added that the quality and reliability of the goods manufactured and the business-like methods employed at the plant have made the name of the John Inglis Company, Limited, what it is to-day.

Another view of the John Inglis Company's boiler shop.

Montreal Notes

The Dominion Bridge Company is preparing to close portions of Second and Third avenues at Lachine for the extensions of its shops and yards. A number of houses will be demolished to make room for the expanding industry, and new workmen's homes will be erected in the vicinity.

Leonard & Frere have taken out a permit for the erection of two six-storey residence buildings of the second class description in Laurier Ward. This means that new buildings of the same class as the Mountain View apartments, which were recently destroyed by fire, are being permitted to be erected in a Montreal ward under the by-laws existing in the town of St. Louis before it was annexed to the city. In fact, the proposed buildings will be one storey higher than the Mountain View and contain accommodation for six families in each.

The committee of experts appointed to revise and redraft the Montreal building by-laws have reported to the chairman of the committee, Alderman Clement, that they cannot complete their work by June 1, the date specified when the appointments were made. Messrs. Francis and Venne, architects, who have been working on the new regulations tendered their resignation, but the Aldermen declined to accept them and decided to extend the time for the completion of the revision to the month of September. Meanwhile all kinds of objectionable buildings are being erected in various parts of the city. A proposal that one expert should take up the work alone, devoting his whole time to it, was made by Alderman Ward, his idea being that one man could quickly dispose of the matter if the remainder of the committee were required to devote only the time necessary for consultation and approval, but this was not approved by the rest of the committee.

Negotiations are under way for the amalgamation or working arrangement between a number of important wholesale hardware dealers in Montreal. Messrs. Jenkins & Hardy, financial agents, of Toronto, and Mr. E. W. McCarthy, of New York, are among the promoters of the deal. It is said that western capital is behind the project to a considerable extent and that probably some large western dealers will be drawn into the merger before it is consummated. A gentleman who is in a position to know, when interviewed by a representative of the Contract Record, said there was nothing definite to be stated as yet, but frankly admitted that negotiations were under way.

Considerable criticism has been levelled at the amendment to the city charter which provided that street paving should be done at the cost of fronting proprietors, instead of at the expense of that city at large, as has been the custom in the past. Strong opposition to work being done under the new conditions has been raised by the proprietors in a large number of streets. A report from the City Hall shows that out of 54 streets in which work was proposed to be done this season opposition was offered by proprietors in thirty of them. It is thought, however, that some of this opposition will be withdrawn or modified and it is now expected that work will be proceeded with on some 25 streets as soon as the contracts can be let. The paving programme for the city as originally recommended by the city controllers would amount to over 11 miles of paving of different kinds being laid.

The E. & T. Fairbanks Company at Sherbrooke, Que., has built a three-storey brick factory to be used in the manufacture of the scales contracted for by the Montreal Harbor Board. The company was already doing a very fair business in Sherbrooke, but found that extended factory space was needed to cope with the extra work involved in getting out the work for the harbor board.

"The Proper Treatment for Floors, Woodwork and Furniture," is the title of an attractive booklet issued by S. C. Johnson & Son, Racine, Wis., in which they describe the advantages which are secured by the use of their excellent variety of artistic wood finishes. The booklet is attractively illustrated in colors and will appeal strongly to any who are interested in the matter of securing the best results along these lines.

Conditions and Prospects at Winnipeg

Critical Observations on the Situation and Outlook—Municipal Activity—The Labor and Supply Markets—Progress on the Big Work

Winnipeg, May 20, 1911.

Winnipeg's building did not get away to the flying start that was anticipated a month ago, and it is rather difficult to trace the influences which have been at work. There is probably no part of Canada where weather conditions have so great an influence on building operations as in the west, and this is probably one of the considerations. The spring opened most favorably for seeding, but for weeks following the seeding there was every indication of continued dry weather. If this had continued retrenchments in expenditures would have been an absolute necessity, in view of the shortage of last year's crop. But the general rains of the past week have relieved the situation wonderfully, and now the country as a whole can get along nicely until July without further soaking rains.

Then, too, the banks have probably been a factor. Conservative business men have been of the impression that the real estate situation in Winnipeg is not all that can be desired. While they are loth to suggest the fateful word "boom," they will confess that the speculation now in progress is headed that way. The banks have recognized this and are tightening up quietly. Should there be a break at this juncture it would materially affect a large amount of really good inside property, which many consider is being held at excessive values.

There are thousands of acres of land in the vicinity of the city which are being exploited as suitable for suburban residential property, some of which is out of all reason, for even the most optimistic cannot contend that a subdivision eight miles from the city and extending back a couple of miles from existing car lines will be valuable in the immediate future. Nevertheless there is a lot of this class of stuff being placed on the market.

In defence of this it is pointed out that building operations outside the city limits are booming and that densely populated suburbs have grown up two and three miles out. Then, too, the city has completed arrangements for a boulevard connecting much of this with the business section.

In St. Vital there is a great amount of building in progress. The Carter, Halls, Aldinger Company are making good progress with the new Agricultural College buildings, though they have been delayed by the railway company, which has not yet laid down the material track which connects with the C. N. R. The excavation is progressing rapidly and within a week or more the foundations should begin to take form. The government has made arrangements with the municipality for the laying of an asphalt pavement from the city limits south past the college site, and the city will make the connecting link on their section of the Pembina highway.

Much Paving Work in Prospect

Road building will be an important feature of the season's work in the vicinity of Winnipeg. The municipality of Assiniboia is planning for paved roads on both sides of the Assiniboine river from the city to Headingly, a distance of fourteen miles. Westrumite or some similar material will be used. In St. Vital there is the roadway already mentioned, and one on the east side of the Red river for about ten miles. To the north, Kidonan is planning for roads parallel to the river, and within a very short time an adequate road to Transcona will become an absolute necessity.

The Bank of Montreal building is making seemingly slow progress, the front elevation having been delayed by the non-arrival of material. Three walls have been completed and a large section of the tile roof is now in position. Last week a couple of carloads of stone were delivered and now the contractors are proceeding with the front. A section of the cornice has been placed, and it is of a most massive construction. It will be one of the finest buildings in the city, in point of architecture and solidity of design.

The Lyall-Mitchell Company have completed the sub-basement work on the new Bank of Commerce, and are now bringing forward the foundation walls. It is stated that all of the stone has been cut and is ready to be delivered on the job as soon as the preliminary steel work has been finished. The fate of the building to the south, part of which collapsed into the excavation for the bank when the frost was out, is still in doubt. An effort is being made to get permission for the company to repair it, but strong objections are being raised.

There were rumblings of labor troubles early in the season but these have almost subsided. The marble workers and structural steel men started strikes but these have been settled without serious disturbance to the situation. There was not sufficient work in sight for either class of men to make the position dangerous to general conditions at any time, and the other trades did not join in the movement.

Good Stocks of Material

The material market is in good shape. Good supplies of brick were carried over from last fall, and the weather has been most favorable to getting at work early in the yards this spring. The steel men, too, have their work well in hand, despite the tremendous amount of railway work which is planned. Their plants have all been increased within the last few years, and the western market has induced considerable competition. Lumber is coming in rapidly and there were considerable stocks in store when the season started. The yards are all exceedingly busy with deliveries, permits having been taken out for a large number of residences this spring. Plans have been prepared and permits issued for many apartment blocks.—L. H. S.

The Good Roads Improvement Company, of Cincinnati, have sent us a copy of an instructive booklet called "Road Bitumens; their Scientific Use and History." The Good Roads Improvement Company were pioneers in the scientific treatment of roads with petroleum bitumen, and it is most interesting to read of the developments which led up to the production of Asphaltoilene. This material is made in three kinds. Complete specifications for any of the three methods will be furnished on request. The specifications or formulae used in the manufacture of Asphaltoilene are not only the result of six years' practical experience in using and applying to roadways asphalt bitumens, from the crude state to the highest perfection yet attained, but are also based upon the experience and experiments, and published reports of the United States Agricultural Department, and the engineering and scientific discussions and papers of the American Society of [illegible] Engineers.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Bridgetown, N. S.

A stone crusher has been purchased. A roller may be purchased. H. Ruggles, clerk.

Brandon, Man.

It is possible that the matter of a new water supply will be considered shortly.

Calgary, Alta.

The City Engineer's Department are preparing plans, etc., for a 6-foot concrete trunk sewer.

The city commissioners are preparing a second by-law for paving this year; about 30,000 square feet of pavement.

Contractors Messrs. Davison & Westaway will commence street grading at La Grange, a suburb of the city, for the American Colonization Co. in a few days.

Cardston, Alta.

Engineer McArthur in his report on the installation of waterworks system here estimated the cost at about $27,000. Mayor Hammer.

Edmonds, B. C.

It is expected that tenders will be called shortly for a number of the roads which will be provided for out of the $300,000 by-law recently passed by the ratepayers. In a few instances it is expected that the work will be done by day labor.

Estevan, Sask.

On June 2nd two by-laws will be submitted to the ratepayers, $5,000 for waterworks extensions and $18,000 for cement sidewalks. L. A. Duncan, secy.-treas.

Fort William, Ont.

Tenders are called until July 1st for the sale of municipal pumping and electrical generating plant. John Wilson, city engineer. Advertisement in "Tenders and For Sale Department" of this issue.

Fort Qu'Appelle, Sask.

Tenders addressed to Wm. Thomson, sec.-treas., will be received until May 31st for construction of about 15,000 sq. feet of cement sidewalks.

Hensall, Ont.

On May 29th two by-laws to raise $16,000 for installation of waterworks will be voted upon. R. Bonthron, clerk.

Hamilton, Ont.

Tenders addressed to Geo. H. Lees, will be received until May 25th for construction of about 12 sewers.

Halifax, N.S.

The different reports of the board of works for water and sewer extension and street pavement, involving an expenditure of many thousands of dollars, were passed. The most important work was the Cobourg Road sewer, which the engineer stated would cost about $98,000.

Middleton, N. S.

This municipality contemplates the expenditure of about $4,000 this summer on a sewerage system. J. A. Gates, clerk.

Moose Jaw, Sask.

Tenders addressed to W. F. Heal, city clerk, will be received until May 29th for the laying of about 41,083 sq. yds. of pavement; also the laying of about 206,061 sq. feet of concrete sidewalks and 46,366 lin. ft. of curb and gutter, also 1056 sq. yds. of wood block crossing. J. M. Wilson, city engineer.

Minnedosa, Man.

A tender addressed to G. Trevor Turley, clerk, will be received until June 6th for construction of granolithic walks here, about 35,000 feet. Specifications etc. at the town clerk's office.

Montreal, Que.

Tenders addressed to the Board of Commissioners will be received until June 29th for furnishing and installing pumping machinery, blower and cranes for the filtration plant here. L. N. Senecal, secretary.

The city council have authorized the calling for tenders to the amount of $2,500,000, which is divided up as follows: $500,000 for sidewalks, $720,000 for public improvements, $677,000 for water mains, and $616,000 for sewers.

Tenders addressed to the Board of Commissioners will be received until May 29th for supply of general supplies and various materials required for the different departments of the municipal service during the year 1911-1912, such as stone, lead pipe, pig lead, cement brick, vitrified clay pipes, spikes; also for purchase of scrap iron, steel, brass, copper, etc. L. N. Senecal, secretary.

North Bay, Ont.

On May 29th two by-laws will be voted on, $45,000 for sewerage purposes and $100,000 for waterworks. W. M. Flannery, clerk.

Pointe Claire, Que.

Tenders addressed to J. L. Vital, secretary-treasurer, will be received until June 1st for construction of permanent sidewalk, four feet wide, from the western boundary to the eastern.

Richmond, B.C.

Municipal council has a scheme on hand to macadamize and put in thorough good order the roads from Steveston to the Lulu Island bridge, so as to form a connecting link with Granville street. Thus, when the work is completed, there will be an excellent highway from Steveton right into Vancouver.

Sault Ste. Marie, Ont.

Tenders are called until June 5th for construction of Section "M" of the sewer system. W. H. Munro, mayor; W. F. Grant, C.E., town engineer. Advertisement in "Tenders and For Sale Department" of this issue.

Tavistock, Ont.

The by-law authorizing the borrowing of $20,000 for a system of waterworks was carried. F. W. Farncomb, consulting engineer. Noted in issue of May 10th.

Tenders are called until June 14th for waterworks supplies and labor. F. W. Farncomb, consulting engineer, 64 Bank of Toronto Chambers, London. Advertisement in "Tenders and For Sale Department" of this issue.

Thorold, Ont.

The report on the new pavement and sewerage scheme was submitted by Mr. Chipman, consulting engineer. Mr. Casey, town solicitor, was instructed to prepare a by-law to cover expenditure involved.

Toronto, Ont.

Tenders addressed to G. R. Geary, chairman, board of control, will be received until May 26th for repairing etc., of the 6-foot steel conduit lying between the intake and the tank, etc.

Firms tendering on 72-inch steel pipe, who can supply same earlier than is called for in specifications, will favorably influence the decision of the board. For further particulars see advertisement in "Tenders and For Sale Department" of this issue.

West Lorne, Ont.

This municipality has authorized a delegation to report on the waterworks system in surrounding towns.

AWARDED

Calgary, Alta.

Commissioners recommend an order be placed with the British Columbia Refining Co. for 100 tons grade paving asphaltum at $16 per ton f.o.b. cars at Port Moody, B.C. Freight charges will bring the cost up to $25.20 per ton.

Chilliwack, B.C.

R. H. Love, Chilliwack, was awarded contract for cement sidewalks here, $1,117. Other prices ranged from $1,158 to $1,489. I. B. Croly, C.E., engineer.

Fort William, Ont.

The following tendered for supply of cement, sand and gravel, delivered on work:

Cement:

Twin City Sand Co'y., Fort William, $160½, (accepted); J. J. Flanagan, Fort

William, $161¼; W. S. Piper, Fort William, 162; Fyfe Hardware Co'y., Fort William, $163.

Sand and Gravel:

James Tonkin, Fort William, $119, (accepted); Twin City Sand Co'y., Fort William, $135; Mount McKay & Kekabeka Ry. Co'y., Fort William, $125.

Moncton, N.B.

The tender of F. & I. Lewis for clearing reservoir site was accepted, $105 per acre; extra plowing and harrowing, $15 per care; allowance of $50 for lumber.

North Toronto, Ont.

The following tenders were received for the three sections of sewage installations:

(1) The work from the southerly limits of the town to Eglinton avenue; (2) from Eglington avenue north to Victoria crescent and Glenwood av--enue; (3) north from Glenwood avenue to the town limits.

No. 1 contract (Davisville)—Messrs. George Crowe & Son, Trenton, $87,000; Campbell & Lattimer, Port Hope, $106,408; John F. Connolly, Toronto, $107,846; Thos. R. Allison & Co., Toronto, $108,013.80; Ryan & Reilly, Philadelphia, $118,360.

No 2 contract (Eglinton)—F. F. Fry, Toronto, $53,570.80; John F. Connolly, $63,852; the J. H. McKnight Construction Co., Ltd., $67,628.66; Thos. R. Allison & Co., $74,897.80.

No. 3 contract (Bedford Park) — James Reid & Co., Brantford, $56,157; the McKnight Construction Co., $62,825; Lorenzo & Marshall, Dunnville, $65,780; Thos. R. Allison & Co., $79,787. The following tenders were recommended for acceptance:—Messrs. George Crow & Son, Trenton, $87,000, to complete the work in 7½ months; No. 2, John F. Connolly, Toronto, $63,852, to complete the work in 7½ months; No. 3, James Reid & Co., Brantford, $56,157, to complete the job in five months.

Ottawa, Ont.

The contract for construction of the west end drainage scheme has been awarded to Thos. McLaughlin, $209,438.

Owen Sound, Ont.

John Cross will supply the pipe for the sewer work being done here, $1,569. R. McDowall, town engineer.

Perth, Ont.

The tenders received for sewers to be built this year were as follows:—Thompson & Donahue—rock, cu. yd., $5.25, earth $1.20, hardpan $1.40, manholes $45, catch basins $4, 8 in. pipe 26c., 6 in. pipe 21c. W. J. Rabb—rock, $1.70, earth 60, hardpan $1.00 [illegible] filling in all cases 35c, manholes $38, lampholes $10, catchbasins $14, 6 in. sewer pipe 17c, 6 in. junctions 45c, 6 in. bend 40c, 8 in. pipe 22c, 8 in. junctions 75c, 8 in. bends 65c . Gaul & Girourad—rock $3.90, earth 60c, hardpan $1.40, manholes $60, lampholes [illegible] ins $5, 6 in. pipe 18c, 8 in. sewer pipe 25c, y branches 75c, tunnelling under C. P. R., cost of work plus 10 per cent.

Regina, Sask.

The tender of the Red Wing Sewer Pipe Company, amounting to $3,700, was accepted; that of the Regina Machine & Iron Works for manhole covers and catch basin covers at $3.10 per 100 lbs. was accepted.

The commissioners advised the placing of an order for waterworks supplies with Bissett & Loucks for gate valves amounting to $175.05, and with the Empire Manufacturing Company for an initial order of brass goods viz.: 40 one-inch main cocks, 40 ¾-inch main cocks, 12 ⅝-inch main cocks, 40 ¾-inch curb cocks, 12 ⅝-inch curb cocks and six four-way branches. (Adopted). James Robertson & Company will supply 10,000 lbs. of three-quarter inch 10 lb. lead pipe at $5.03¼ per cwt.; 1,000 lineal feet of two-inch galvanized iron pipe at $15.60 per 100 feet; 400 lbs. of spun oakum at $3.60 per cwt.; the total amounting to $723.98 f.o.b. Regina. The amount of the alternative tender from James Ashdown & Company for the above material was $745.00. The tender for nut washers submitted by A. McPherson & Son was accepted. The firm agreed to supply 4,500 three-quarter inch track bolts and 10,000 one-inch track bolts for $123.52, which was $21.49 lower than any other tender.

Smith's Falls, Ont.

The Madison Williams Foundry Co., Lindsay, have secured the contract of supplying the turbine and pumps for the waterworks. The pump will have a capacity of two million gallons, and will weigh thirty-seven thousand pounds.

Railroads, Bridges and Wharves

Cornwall, Ont.

It was decided to build concrete bridge across the creek at Augustus, Fifth and York streets, in accordance with plans of engineer W. H. Magfood. The opening will be eight and a half feet and four feet high, with a bevel approach. It was decided to proceed at once with the building or the new cement walk on the North side of Fifth street, between Pitt and Cumberland streets.

Fort Wiliam, Ont.

Owing to the changes necessary regarding the reinforced concrete subway, tenders will not be called as soon as contemplated. John Wilson, city engineer.

Fredericton, N. B.

Tenders are called by Public Works Department, for the building of Indiantown bridge. Plans at above department, at D. McLaughlin's, Chatham, and Renous Bridge Lumber Co., Renous Bridge, Northumberland county.

Lethbridge, Alta.

The Board of Trade will probably petition the government for two bridges over the river at Diamond City and at Twelve-Mile coulee. J. L. Manwarning is interested.

Tenders are under consideration for an overhead bridge at Lethbridge for the C. P. Ry., 90-ft. steel span, three 60-ft. girders and 450 ft. timber approaches. Estimated cost, $80,000

Montebello, Que.

Tenders will be received until June [illegible], 1911, for the construction of a wharf at Montebello, Labelle County, P.Q. Plans at the office of J. L. Michaud, district engineer, St. James street, Montreal; on application to the local postmaster, and at the office of R. C. Desrochers, secretary department of public works, Ottawa.

Rivers, Man.

Tenders addressed to James R. Shanks, chairman bridge committee, Wheatland P.O., Man., will be received until June 15th for supply, erection, etc., of masonry abutments; a 90-foot steel span, 16-foot roadway, steel stringers, for a bridge over the Little Saskatchewan river, one and one-half miles from here. Copies of drawings, etc., at the office of the above, and also at the office of the chief engineer, department of public works, Winnipeg. Bridge plan No. 243.

Toronto, Ont.

Tenders are called until June 5th for construction of a reinforced concrete arch bridge over a branch of the Highland Creek etc. Barber & Young, engineers, advertisement in "Tenders and For Sale department" of this issue.

AWARDED

Calgary, Alta.

Contract for piers and abutments at 8th street west, Sudbury, amounting to about $17,500, has been awarded to J. J. Davis & Co., Calgary.

Edmonton, Alta.

Phelan & Shirley have the contract for grading the approach to the C. P. R. high level bridge from the Strathcona side. The contract calls for the removal of about 58,000 cub. yds. of earth.

Fredericton, N.B.

The contract for building the Benjamin river mouth bridge at Colburn parish, Restigouche County, has been awarded to Mr. A. E. Smye, of Alma, Albert County, $4,600. The contract for the Babcock bridge at the parish of Salisbury, Westmorland County, has been awarded to Mr. A. D. Murray of Penobsquis, $3,200.

Quebec, Que.

The contract for the construction of bridge over the St. Charles river, has been signed by Mayor Dronin and Mr. Francis Lemoine, representing the firm of F. Lemoine & Son, Montreal $156,200; work to be completed on 1st of April, 1912.

Toronto, Ont.

The contract for completion of the C. N. R. from here to Ottawa via Belleville has been awarded to Messrs. J. P. Mullarkey, Montreal; A. Sinclair and E. Mackenzie, Toronto.

Public Buildings, Churches, Schools, etc.

Baddeck, N.S.

Tenders addressed to D. J. McIntosh, P. P., will be received until May 31st for installing a hot water heating system, etc., in the Presbytery.

Brandon, Man.

The school board have an option on property east of the Normal School site [illegible]

Brockville, Ont.

Tenders addressed to B. Dillon, architect, will be received until May 31st the erection of an additional storey of the south wing of the General Hospital, B. Dillon, architect.

Burnaby, B.C.

Tenders are called by Public Works Department, Victoria, until June 12th for erection of prison-farm building here. Drawings, etc., at the offices of Hugh A. Hodgson, Esq., rooms 309-310 Cotton building, Vancouver; Government Agent, New Westminster, and at the department of public works.

Brocket, Alta.

Tenders addressed to J. D. McLean, secretary, Department of Indian affairs, Ottawa, will be received until June 15th for construction of a groin elevator on the Crows Nest Branch of the C. P. R. here. Plans, etc at the office of the "Advertiser," Macleod, the "News," Pincher Creek, "The Albertan," Calgary, and at the Indian Agency office, Brocket, Vancouver, B. C.

Calgary, Alta.

A permit was granted to St. Paul's congregation for their new church, $35,000.

The city commissioners will have erected in the near future a Henan & Froude incinerator.

The congregation of St. John's Church have decided to enlarge their present quarters.

Mr. Lang, architect, 229A 8th avenue east, is preparing plans for two 4-room schools of solid brick with stone trimmings. Estimated to cost about $23,000 each.

Camrose, Alta.

Tenders will soon be called for carpentry and plumbing for the Scandinavian college for Alberta. Work on excavation has commenced.

Cranbrook, B.C.

Plans are being prepared by Mr. J. J. O'Gara, architect, for the brick addition to St. Eugene Hospital.

Edmonton, Alta.

Sherman & Loughead of Calgary are planning to erect an up-to-date theatre here.

Fort William, Ont.

Tenders are being called until May 25th by G. H. Williamson, gen. sec'y. Y. M. C. A., for the purchase and removal, within ten days of acceptance of tenders, of buildings on lots 64 and 65 East Archibald street.

Gananoque, Ont.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, Ottawa, will be received until May 31st for addition to Post Office building. Plans etc. on application to the caretaker local post office, and at the above Department.

Grand Mira, N.S.

Tenders addressed to D. J. Rankin, P. P., will be received until June 3rd for the painting of the exterior and interior of the Glebe House, the exterior of church and also for the painting of the exterior of the churches at French road and Garabus.

Guelph, Ont.

The plans of Architect W. A. Mahoney, of this city, and those of Mr. Stewart of Hamilton, for erection of county jail were favorably considered. Estimated cost, $20,000.

Halifax, N. S.

Tenders are called until May 31st by Public Works Department for fittings for post office. Plans, etc. at this Department, and at the office of Mr. D. A. Hewitt, architect, Custom House, Halifax.

Tenders addressed to the Commissioner of Public Works will be received until May 27th for construction of the laboratory of mining engineering to be erected in the rear of the N. S. Technical College. Plans etc. at the above college, at Registrar of Deeds offices at Sydney, Truro, Amherst, Windsor, Yarmouth and at office of town clerk.

New Glasgow

The city engineer was authorized to report on the construction of a garbage incinerator.

London, Ont.

The plans submitted for the new court house were adopted and tenders for the improvements to cost about $25,000 will be called at once. City Architect, Mr. Nutter.

Medicine Hat, Alta.

A permit has been granted to the Western Baptist church, $40,000.

It is stated that W. Roper Hull will erect here an up-to-date theatre shortly.

Tenders addressed to Gordon & Helliwell, architects, will be received until May 25th for erection of a parish building for St. Anne's church, Dufferin street.

Tenders addressed to R. G. Geary, Board of Control, will be received until May 30th for supply and erection of portable sectional screens, counters and office fixtures in the Main Corridor, city hall. Plans etc. at offices of the Property Department.

An opera house, with stores and offices, 125 x 130, brick and stone, is being erected for W. R. Hull Calgary. Tender for excavation has been let to A. P. Burns at 40 cents. As far as can be learned building will be carried on by day labor. Estimated cost, $75,000. Plans not completed.

Montreal, Que.

Tenders addressed to the board of commissioners, will be received until May 31st for demolition of the wings of the Smallpox hospital and the reconstruciton of the present main building and a wing or extension in connection with the same. Plans, etc., obtained from Messrs. Marchand & Haskell, architects, 164 St. James street. L. N. Senecal, secretary.

Minnedosa, Man.

The public building here to be erected by the government will be a combined post office and drill hall. Estimated cost, $20,000.

New Westminster, B.C.

Competitive plans will be asked for erection of two new schools, one at Lulu island and another at Sapperton.

Niagara Falls, Ont.

Tenders addressed to George Mortimer, secretary public school board, will be received until May 29th for erection of additions to the Barker street public school. A. E. Nicholson, architect, St. Catharines.

Ottawa, Ont.

The location of the new departmental block for which specifications have been prepared, has met with opposition.

Tenders addressed to R. C. Desrochers, secretary, department of public works, Ottawa, will be received until May 30th, for the fittings for Census Branch. Plans, etc., at office of above.

Port Arthur, Ont.

The C. N. R. has given the Sailors' Institute a site for building on the water front near the foot of Park street. Sketches for the new building have been drawn up by F. Urry, architect, and forwarded to the Sailors' Mission Board in Toronto. Estimated cost, $30-000.

Prince Rupert, B. C.

The First Presbyterian Congregational will erect their church at an estimated cost of $25,000. Pastor, Rev. F. W. Kerr.

Prince Albert, Sask.

Competitive plans are called for an eight-roomed school house to cost about $35,000. Particulars on application to C. O. Davidson, secretary.

Regina, Sask.

Tenders will be called about June 1st for addition to Victoria school. Estimated cost, $50,000. Architects, Sharon & Darrach.

Tenders will be called about June 1st for addition to Albert School here. Architects, Storey & Van Egmond. Estimated cost, $30,000.

Stettler, Alta.

A new fire hall and town clerk's office will be built here this summer.

South Vancouver, B. C.

The Mountain View Methodist church will be built of brick. Contract is stated to have been let.

St. Charles, Man.

Tenders addressed to Frank Ness, sec.-treas., will be received until May 27th for erection of brick veneer Municipal Hall. Plans etc. at office of the above or at the office of Messrs. Hooper & Hooper, architects, 313 McIntyre block.

Saskatoon, Sask.

A campaign to raise $100,000 for Y. M. C. A. building has been commenced.

The by-law for hospital extension and involving an expenditure of $185,000 will be voted upon on May 25th.

Storey & Van Egmond were authorized by city council to prepare plans for erection of a new machinery hall for the fair grounds.

Tenders addressed to W. P. Bate, secretary school board, will be received until May 25th for erection of the school. Plans etc. at office of D. Webster, architect, No. 4, Kempthorn block.

The building committee, composed of F. A. Blain, G. H. Clare, A. Smith and W. Moser, have asked Brown & Vallance, architects, Montreal, to submit further plans for the new $100,000 Presbyterian church.

Mr. F. P. Martin is the architect for the erection of the Baptist church to be erected here. It will be constructed of twin city brick with heavy cut stone trimmings. The following are members of the building committee: C. I. Greene, J. Wheaton and W. A. Elliott.

South Vancouver, B. C.
Tenders for erection of new municipal hall are being called. Plans prepared by Engineer Harvie call for a building 50 feet x 80.

St. Catharines, Ont.
The plan of Mr. A. E. Nicholson, architect, for the 8-room school was accepted by the board. The plans call for red brick with white terra cotta trimming. Thirteen plans were submitted.

St. John, N.B.
F. Neil Brodie, architect, has been instructed by the Provincial Tuberculosis Commission to prepare plans for the necessary changes in the building donated by Mrs. J. C. Jorden, of Boston, for a sanitarium. The building is situated at River Glade, N.B.

Plans are expected here during the next week or ten days for the new theatre to be erected by the Keith Syndicate on King Square, this city. While nothing can be learned of the details it is known that the building will be on an elaborate scale with a specially attractive front.

Teeswater, Ont.
Tenders addressed to W. Case, sec.-treas., will be received until June 1st for erection of a brick school for S S. No. 2, Culross.

Thamesville, Ont.
Plans for the new town hall were approved by a meeting of citizens.

Toronto, Ont.
St. John's Anglican congregation will build a new parish house to cost $15,000 to the east of the church.

Tenders addressed to W. C. Wilkinson, secretary-treasurer, board of education, will be received until May 29th for enlargement of the following schools: Fern avenue, Ogden and Roden. Advertisement in "Tenders and For Sale Department" of this issue.

Trenton, Ont.
The Carnegie Library by-law was carried.

Vancouver, B.C.
Tenders for the Lord Tennyson school are to be called for as soon as plans are completed.

As decided by the ratepayers last January the school trustees will start at once the erection of a new school house, costing $65,000, on Victoria drive. Plans and specifications have been decided on.

The Knights of Pythias have a project well under way for the erection of a temple in Vancouver. It will cost in the neighborhood of $100,000. A fifty foot site has been secured on the east side of Howe near Smythe.

Victoria, B.C.
Plans will soon be submitted to city council, it is stated, for an up-to-date swimming bath on Dallas Road.

The city engineer, purchasing agent, and Alderman Okell have been authorized to report on the purchase of a new incinerator plant.

It is probable that the plans of C. E. Watkins, architect, will be accepted for the new high school. They call for a 4-storey reinforced concrete building with basement.

West Toronto, Ont.
The Davenport Road Methodist church will erect a school house to cost about $10,000. Tenders will be called shortly.

Wetaskiwin, Alta.
Tenders addressed to R. C. Desrochers, secretary, will be received until June 6th for construction of public building here. Plans etc. at office of J. E. Cyr, supt. of public buildings for Manitoba, Winnipeg, Man., W. T. Mollard, clerk of works, Regina, Sask., and at the local post office.

Winkler, Man.
The time for receiving tenders for erection of 4-roomed brick school here has been extended until June 1st. B. Louven, chairman.

Wynward, Sask.
The plans of W. W. LaChance, architect, Saskatoon, have been accepted for the erection of proposed new school here. Estimated cost, $15,000.

AWARDED

Amherst, N.S.
The town of Amherst has signed a contract with the Victor Wood Working Co. for a new 12-room brick and cement school to cost $46,500. Nelson Fage has a sub-contract for mason's work. Leslie F. Fairn, architect, Aylesford, N.S. ... ...

Annapolis Royal, N.S.
Contract for brick and granite church for the Methodists of Annapolis Royal, N. S., has been let to J. F. Bent, of Middleton, N.S., $12,000. Leslie R. Fairn, architect, Aylesford, N.S.

Battleford, Sask.
The Municipal Light, Heat & Power Co., Brandon, Man., have the contract for hot water heating of the public building here.

Calgary, Alta.
Tenders were let to I. McDarmid & Co., of Winnipeg, for the B. C. Land and Irrigation Department Building. Contract price for building complete, $103,000. There were eight tenders for the job. Messrs. Hodgson & Bates are the architects.

Campbellton, N.B.
Mr. J. Medley Belyea, West St. John, has been awarded the contract for erection of new Presbyterian Church, $30,000.

R. Mooney & Sons, St. John, have been awarded the contract for erection of Masonic Hall, $9,000.

Messrs. Lutz & Cripps, Sussex, N.B., have the contract for erection of [illegible] [illegible] 12-room cement and brick school, [illegible]. Architect, Leslie R. Fairn, Aylesford.

Charlottetown, P.E.I.
The contract for erection of Zion Presbyterian Church and Sunday School combined, brick and stone, has been awarded to J. M. Clark, Summerside, P.E.I., $31,985. Other tenderers were B. D. Buntley, Charlottetown, $34,395; H. & S. Lorne, Charlottetown, $34,800; Chas. McGregor, Charlottetown, $38,461. Murdoch Macleod, secretary, building committee.

Cornwall, Ont.
The House of Refuge for the counties of Stormont, Dundas and Glengarry, will be built at Cornwall by Mr. Alex. Cameron, of Alexandria. Tender calls for a two-storey building of concrete blocks, with basement. The main building will be 132 x 40.

Edmonton, Alta.
The contract for erection of brick stock pavilion has been awarded to Hanson & Dunlop by the Exhibition Association, $67,000 approximately. $112,000 total.

Gretna, Man.
The contract for erection of school here has been awarded to W. J. Harris, 198 Horne street, Winnipeg, Man., $17,547. C. Wahn, secretary-treasurer.

Kitsilano, B. C.
The contract for the new Catholic Church in Kitsilano, which the Oblate Fathers intend to erect, has been awarded to Campbell & Wilkie. The price is $38,000, which does not include heating and plumbing. Work will be started immediately. Father Tavernier, O. M. I., lately superior at Mission City, will be in charge of the new church.

Merritt, B. C.
Mr. William Cooper has been awarded the contract for the erection of a new school building here.

Michel, B. C.
The contract for the erection of a large one-room school at Michel has been awarded by the provincial minister of works to George A. Watson, $5,060.

Montreal, Que.
The Protestant Board of School Commissioners are having an addition made to their Victoria school, St. Luke street. The extension will provide a gymnasium. The contract for the plumbing, heating and ventilation, amounting to $6,450, has been awarded to D. A. Bethune. The general contract, apart from this, amounts to $22,922, which will be shared in by the following sub-contractors: J. H. Hutchison, masonry; Structural Steel Co., Ltmited, steel work; J. N. W. Morrison, carpentering; Roebling Construction Co., concrete; R. G. Hamilton, plastering; Campbell & Gilday, roofing; Montreal Architectural Iron Works Co., iron; Montreal Electric Co., Limited, electric wiring; G. E. Blackwell, painting and glazing.

Mr. P. Lessard, contractor, has taken out a permit for the erection of a combined fire and police station for the town of Outremont to be situated on St. Just Avenue. The estimated cost is $22,000. Hutchison, Wood & Miller are the architects. Work has already been commenced on the foundations. The superstructure will be of brick and stone.

Orangeville, Ont.
The contract for electric wiring and fixtures for [illegible] [illegible] has been awarded to Hall & Dollery Elec Co., Toronto.

Regina, Sask.

The contract for erection of public [illegible] has been awarded to Wilson & [illegible], Regina, $50,000.

Vancouver, B. C.

[illegible] Ryan was awarded the contract for the erection of the proposed new theatre, at 965 Granville street, for the Dominion Theatre Co., Ltd. The contract price was $48,000. Parr & Fee are the architects.

The contract for the two-storey eight-roomed school building at the corner of Sixth avenue and Bayswater street has been awarded to Messrs. John Watson & Brothers, the amount being $50,000.

Wolfville, N. S.

A. W. Allen & Son, Middleton, have contracted for erection of Baptist church here, brick with stone trimmings, cost about $40,000. Architect, C. B. Chappell, Charlottetown, P. E. I.

Winnipeg, Man.

The contract for the Brooklands' school has been awarded to John Dolner, the contract price being $43,000.

S. B. Ritchie's tender for the building of new Science and Arts building at the exhibition grounds, to take the place of the old main building destroyed by fire last fall, was accepted.

Residences

Aylesford, N.S.

Four or five cottages and two or three stores will be erected here this season in the burned area.

Calgary, Alta.

Tenders were called until May 20th for erection of an apartment house on Fourth street west. Plans etc. at office of the architect, F. J. Lawson, Norman Block.

Messrs. Lang & Major, architects, have prepared plans for a solid brick, with stone trimmings, apartment house, 50 x 80 feet, on 17th avenue, for I. Reid. Tenders closed the 23rd inst. Estimated cost, $40,000. I. Reid, Esq.

Campbellton, N.S.

Arhitect Leslie R. Fairn is preparing plans for cottage and stable for Geo. L. Pearson, Esq., of Paradise, N.S. Tenders will close on May 26th. Cost, $3,800.

Leslie R. Fairn, architect, has prepared drawings for a modern residence for Judge McLatchy.

Gull Lake, Sask.

Pease Waldon Company, Winnipeg, have been awarded the construction of the 8-room school house, $35,000. Other amounts tendered not including heating, were from $21,925 to $28,600.

Medicine Hat, Alta.

Hon. W. T. Finlay will erect a new and handsome residence on the site of the old one.

Saskatoon, Sask.

The building committee of Knox Presbyterian Church, composed of F. A. Blain and others, have decided to go ahead with the erection of the new manse.

Victoria, B.C.

Plans have been prepared by Max Umbrick, Seattle, for an apartment house, 3-storeys, to be built for a Seattle syndicate on Government street. It is stated that ground will be broken for the foundation before June 15th.

Tenders will be received until May 25th for erection of a building for A. E. Todd, corner of Langlty, Courtney and Wharf streets. Thos. Hooper, architect.

AWARDED

Middleton, N.S.

Contract for cottage and stable for W. F. C. Parsons, M.E., Middleton, N.S., has been let to J. F. Bent of that place. Cost, $4,500. Leslie R. Rairn, architect, Aylesford, N.S.

Torbrook, N. S.

J. H. Hicks & Sons, Bridgetown, has been awarded contract for building 12 cottages here for Canada Iron Corporation Co., total cost, $7,000; to be finished Aug. 1, 1911.

Business Buildings and Industrial Plants

Amherst, N. S.

The saw, planing and lath mills of the Rhodes Curry Company, Limited, were destroyed by fire on the 16th inst. Estimated loss, $25,000.

Almonte, Ont.

In the fire of the 16th inst. the losses approximated as follows: McAdam block and store, $40,000; Patterson block, $10,000; Davis block, $5,000; Hopkins, $15,000.

Brantford, Ont.

Building permit has been issued to M. H. Robertson, for brick store on Erie avenue, $4,750.

Belleville, Ont.

The council have granted a free site, etc., to the Allard Platinum & Mining Company, who are to install a $10,000 plant. A by-law to that effect will be submitted to the ratepayers.

Calgary, Alta.

Tenders were called on the 15th inst. for a 6-storey store and office building. Messrs. Lang & Major, architects.

The Bank of Montreal is going to make an addition to their present building.

Messrs. Hodgson & Bates have got out sketch plans for a bank building at Oakville for the Bank of Montreal to cost about $4,500.

Chatham, Ont.

The Chatham Cement & Tile Works will commence to build two factories in the southwest district at once.

Edmonton, Alta.

The site for the new warehouse for Petrie & Co., Toronto, nas been secured and tenders called. Estimated cost, $20,000. Work will start on award of tenders. James Henderson, architect.

Fort William, Ont.

Tenders are being called for the excavation work in connection with erection of block of stores under contemplation by R. A. Ruttan, Port Arthur, and Temple Godman, London, Eng.

High River, Alta.

Messrs. Hodgson & Bates, architects, Calgary, are preparing plans for a solid brick and stone facing building for the Bank of Montreal here. Size of building, 40 x 58. Estimated cost, $7,500. Tenders will be called for in a few days.

Ingersoll, Ont.

The Morrow Screw Company have under consideration extensions to their plant if certain civic privileyes are granted. Estimated expenditure, about $150,000. J. A. Coulter, president.

London, Ont.

A building permit was issued to McClary Company for their extension, $18,000.

Medicine Hat, Alta.

Tenders are being called for the new block for the Medicine Hat Printing & Publishing Company, Limited. W. T. Williams, architect.

Tenders for erection of extensions to Cosmopolitan Hotel will probably close May 27th. Plans, etc., were ready on May 20th. W. S. Williams, architect. Noted in last issue.

Moose Jaw, Sask.

Tenders will be called for in a few days by Mr. Bunyard, the architect, for 3-storey warehouse for Massey-Harris Company. Mr. George Forsyth, manager, Saskatchewan branch.

Montreal, Que.

It is stated that J. C. Wilson & Co., paper manufacturers, have under consideration the erection of a fireproof building on the corner of St. Alexander and Laguachetiere streets. Plans are being prepared by Messrs. Ross & Mcfarlane, architects.

Orillia, Ont.

Messrs. Cavana & Watson have under consideration the erection of a brick block on the corner of Mississaga and West streets. They have not yet fully decided whether they will erect the building this year.

Ottawa, Ont.

Tenders addressed to P. E. Ryan, secretary, Commissioners of the Transcontinental Railway, will be received until June 14 for erection of station and other buildings required along the line of the Transcontinental Railway in New Brunswick, Quebec, Ontario, etc. Plans etc. obtained at the office of Gordon Grant, chief engineer, Ottawa, and at the district offices at St. John, Quebec, North Bay and St. Bonifice, Man.

Preston, Ont.

The Car & Coach Company will enlarge their plant.

Regina, Sask.

It is reported that Thomas Ryan & Company, of Winnipeg, will erect a five-storey warehouse here.

The Thomas Ryan & Company, boot and shoe dealers, will erect a 5-storey building here on South Railway street and Smith. Local manager, Mr. Stevenson.

Tenders will be called about June 1st for 5-storey office buildiig for the Dominion Trust Company, estimated cost, $70,000. Architects, Messrs. Storey & Van Egmond.

Stettler, Alta.

The C. N. R. will build a fine station here in the near future.

St. John, N.B.
Plans are being prepared by Architect F. Neil Brodie for a three-storey brick building to be located at the corner of Union and Brussels streets. The building will have in it three stores and five tenements.

Toronto, Ont.
The Massey-Harris Company proposes to enlarge their works, necessitating the construction of tunnels and overhead bridges which has been granted by the council.

Victoria, B.C.
The B. C. Electric Railway Company have purchased 6¼ acres of land on the Burnside road on which a building for general utility purposes will be erected.

The preparation of plans, etc., for the enlargement of the Empress Hotel has been authorized by Sir Thos. Shaughnessy, president of the C. P. R. Estimated cost, about $200,000.

Vancouver, B.C.
The Merchants Exchange Hotel, the oldest hotel in the city, has been closed and the block will be remodelled into a modern office building, at the corner of Seymour and Hastings street, one block east from the post office.

The Canadian Fairbanks Company, Limited, have under consideration the erection of a business building here, which, it is reported, will cost about $250,000. H. J. Fuller, Montreal, president. The Munro Steel and Wire Works of Winnipeg, are looking for a building site. Jas. Munro, manager.

Winnipeg, Man.
The Central Garage, Water street, was destroyed by fire on the 18th inst. Loss on building, $25,000.

Plans for new Sterling Bank on Portage avenue, have been changed to admit of nine storeys, 118 feet in height. The construction will be brick and terra cotta, instead of stone. Chisholm & Sons, architects.

The Confederation Life Association, head office Toronto, will erect a 10-storey building on the site of its present building, 467 Main street. D. McDonald, western manager. J. W. Gray, architect, Toronto.

AWARDED

Calgary Alta.
Work has begun on the addition to Pryce Jones Building. Messrs. Archibald & Co., got the tender, for $150,000. The addition is 80 x 100 feet, 3 storeys and basement. Messrs. Hodgson & Bates, architects.

Messrs. Givin & Co., Winnipeg, have secured the contract (60,000) to build a 6-storey warehouse for Messrs. Nicholson & Bain, at the corner of 11th avenue and 5th street west.

Chatham, Ont.
Moore & Stephens and W. Robertson have the contract for the building for the Chatham Malleable Iron & Steel Manufacturing Co.

Middleton, N. S.
The contract for erection of Royal Bank of Canada has been awarded to A. W. Allen & Son. It will be brick with granite finish; cost, about $10,000; work to commence at once; K. G. Rea, architect, Montreal.

Port Arthur, Ont.
W. F. Fortune will soon begin the erection of a large brick veneer residence on Arthur street. R. Halton, architect. Estimated cost, $10,000.

Port Arthur, Ont.
The city council has had preliminary sketches drawn for a second store house 33 ft. x 97 ft., on Front street. Estimated cost, $5,000

Regina, Sask.
The contract for erection of warehouse for Great West Saddlery Company, Winnipeg, to Wilson & Wilson, $15,000.

Walkerville, Ont.
Wills & Gray, Limited, Toronto, have been awarded the contract for the erection of a reinforced concrete factory building for Messrs. Walker & Sons.

Winnipeg, Man.
Permits were issued to H. Gooderham for brick residence, $22,000; architect, J. D. Atchison; contractors, Davidson Bros; also for apartment building on Westminster avenue for Albert Johnson, $60,000.

Power Plants, Electricity and Telephones

Alvinston, Ont.
Tenders are called until May 31st for construction of telephone system into the township of Brooke etc. H. R. Carruthers, secretary, Advisory Board. Advertisement in Tenders and For Sale Department of this issue.

Bassano, Alta.
Turbines are being installed in the dam now being built by the C. P. R. Irrigation company which it is estimated will develop 28,000 h.p.

Calgary, Alta.
The Alberta Electric Railway bill will be a distinct advantage to Calgary in that this city will, during the next three years have a complete electric railway line between Medicine Hat and Banff, with Calgary as the main seat of operations. This railway will be operated by the Alberta Electric Railway company recently incorporated; capital, $10,000,000. Work will commence on the proposed new road at once. This section of the line will be 79 miles in length.

Hamilton, Ont.
The Dominion Power and Transmission Co. are considering the construction of an electric line to Galt. Mr. Hawkins, manager.

Moose Jaw, Sask.
The $35,000 by-law for extension to electric light system will be submitted on the 26th inst.

Tenders addressed to W. J. Carter, secretary-treasurer Chester Rural Telephone Co., will be received until June 1st for construction of telephone line north from Moose Jaw and easterly about 28 miles. Poles supplied f.o.b. Moose Jaw.

Nelson, B.C.
It is stated that application will be made on June 16th for a license to use [illegible] cubic feet of water per second for power purposes from the Kootenay river at Granite, four miles below Nelson. The proposed works are a dam, canal and power house. A. L. McCulloch, mining engineer, Nelson, is interested; W. F. Teetzel, water commissioner for this district.

Nictaux Falls, N. S.
The Canada Iron Corporation, Montreal, have under construction in connection with their iron mines at Torbrook a washing plant to cost $75,000, and an electric water power plant to cost about $70,000. E. M. Archibald, Nictaux Falls, engineer.

Saskatoon, Sask.
The electric light plant by-law for $25,000 will be submitted on the 25th inst.

Victoria, B.C.
The city is calling for tenders for 300 electric light standards for street lighting purposes. The new standard is of the same design as that now in use in Vancouver and New Westminster. The standard already in use here, one which a number of the members of the council approve of and prefer to that in use in the mainland cities, costs some $24 each more than the latter. It is with the object of ascertaining just what the new standard will cost that tenders are being asked.

AWARDED

Moncton, N.B.
R. W. Whelpley, Moncton, has been awarded the contract for excavating the main pipe line for the natural gas between the wells and Moncton.

Mosoe Jaw, Sask.
Somerville and Ilson, Regina, have the contract for construction of rural telephone line at $56 per mile.

Niagara Falls, Ont.
Hendrick H. Leach & Co., it is stated, have been awarded the contract to build an extension of the Niagara Falls, Welland & Lake Erie Ry. through Welland. The line will connect Niagara Falls, Welland and Port Colborne, with branches to Port Dover on Lake Erie, and to Ft. Erie on the Niagara River, opposite Buffalo. C. J. McLaughlin, Toronto, Ont., is interested.

Ripley, Ont.
The contract for construction of municipal system has been awarded to W. H. Lytle, Peterborough, $4,400.

Swift Current, Sask.
The contract for installation of eleven miles of rural telephone has been awarded to Chas. Wilson, this city.

Miscellaneous

Belleville, Ont.
Tenders addressed to R. C. Desrochers, secretary, department of public works, Ottawa, will be received until May 26th for dredging required here. Specifications obtained on application to the above mentioned.

Berlin, Ont.
On May 31 two by-laws will be submitted to the burgesses, $7,400 for street railway track extensions, and $15,000 in aid of the Berlin and Waterloo Hospital Trust, A. H. Millar, town clerk

(Continued on page [illegible])

Tenders and For Sale Department

CITY OF LONDON, ONT.

ENGINEERING DEPARTMENT

Applications are invited by the city council for the position of Assistant City Engineer of London. Such applications must be enclosed in plain envelopes and maked 'Assistant City Engineer, and filed with the city clerk not later than five o'clock on **Thursday, June 1, 1911.** A full statement of qualifications and references must also be enclosed.

S. BAKER,
City Clerk.
21-21

Steam Shovels

We own and have for sale near Buffalo, N.Y., two Vulcan 75-ton 2½-yard steam shovels; late model, with new extra large boilers and in excellent condition; also one 70-ton. These will stand most rigid inspection and we are offering them at unusually low prices. Confer with us.

WILLIS SHAW MACHINERY CO.,
39 So. La Salle Street,
Chicago, Ill.

City of Prince Albert

TENDERS

Sealed tenders addressed to the City Commissioners will be received until noon on **Wednesday, the 31st day of May, 1911,** for the following:

(a) Extensions to Water and Sewerage Systems:

12-in. Cast Iron Sewage Pumping Main,	2,365 lin. ft.
10-in. Cast Iron Water Main,	2,966 lin. ft.
8-in. Cast Iron Water Main,	1,034 lin. ft.
6-in. Cast Iron Water Main,	8,798 lin. ft.
24-in. Storm Sewer (Vitrified Pipe)	1,300 lin. ft.
18-in. Storm Sewer (Vitrified Pipe)	1,650 lin. ft.
8-in. Storm Sewer (Vitrified Pipe)	928 lin ft.
12-in. Sanitary Sewer (Vitrified Pipe)	3,580 lin. ft.
10-in. Sanitary Sewer (Vitrified Pipe)	440 lin. ft.
8-in. Sanitary Sewer (Vitrified Pipe)	7,648 lin. ft.
Manholes,	35.
Catch basins,	28.

(b) Construction of Concrete Sewage Pumping Station No. 2.

(c) Supplying and erection of two Electrically driven Centrifugal Sewage Pumps and Motors.

Plans and specifications (see (a) and (b)) may be seen at the office of the City Engineer. Sec. (c) will be forwarded on application and will be on file at the office of Canadian Engineer, Builders' Exchange, Winnipeg, after May 15th.

Marked cheque payable to Secretary-Treasurer of the City of Prince Albert must accompany each tender as follows:

Section (a)—$2,000.
Section (b)—$200.
Section (c)—$200.

The lowest or any tender not necessarily accepted.

ANDREW HOLMES, Mayor.
C. O. DAVIDSON, Secretary-Treasurer.
F. A. CREIGHTON, City Engineer.
CITY COMMISSIONERS.

Dated at Prince Albert, Sask.,
May 8th, 1911.

Street Paving

Sealed tenders marked "Tenders for Paving," will be received by the undersigned up to 12 o'clock noon of **Monday, May 29th,** for paving in the Town of Waterloo. Tenders are invited for various kinds of pavements.

Patent pavement tenders are to be accompanied by full specifications.

Pavements to be constructed approximately 13,500 square yards.

Marked cheque for five per cent. of amount of tender must accompany each bid.

The lowest or any tender not necessarily accepted.

FORD S. KUMPF,
Town Clerk.

Waterloo, May 12, 1911. 20-21

Tenders Wanted

Tenders will be received by the Council of the Township of Hullett up till **2 p.m. on Saturday, the 27th of May,** for the building of a steel bridge 100 feet, between abutments, 16 ft. roadway with cement floor on the River Maitland, about 7 miles north of Seaforth. Also for the building of cement abutments to support said bridge. And also for the building of one cement abutment at Wallace's Bridge near Summerhill in said Township.

The lowest or any tender not necessarily accepted.

Specifications for the cement work can be seen at the Clerk's Office.

JAMES CAMPBELL,
Clerk Tp. Hullett,
20-21 Londesboro P.O.

City of Prince Albert

Tenders for

POWER WORKS

Sealed tenders will be received until 8 p.m., Tuesday, June 13th, 1911, by the Corporation of the City of Prince Albert, Province of Saskatchewan, for the construction of Dam and Headworks and Canal and Power Station Foundations, being portions of the proposed Hydro-Electric Power Development, on the North Saskatchewan River, at La Colle Falls, (distant 25 miles east of the city).

Tenders are invited on each separately, and must be plainly marked on the outside of envelopes, and addressed to the Secretary-Treasurer, City of Prince Albert, Saskatchewan.

Each tender must be accompanied by an accepted bank cheque, for **$5,000,** payable to the Secretary-Treasurer, which cheque will be returned to the bidder, unless he fail to execute a contract, should it be awarded to him.

The successful bidder, on each of the works, will be required to execute a Bond, in the sum of $40,000, for the faithful performance of the contract.

The City reserves the right to reject any or all tenders.

The plans and specifications will be on file, and may be seen on and after **May 23rd, 1911,** at the City Hall, Prince Albert; office of "Canadian Engineer" at Winnipeg; office of "Canadian Engineer," Montreal, or at the offices of the Engineers, C. H. & P. H. Mitchell, Traders Bank Building, Toronto, Ont.

ANDREW HOLMES, Mayor.
C. O. DAVIDSON, Secretary-Treasurer.

Prince Albert, Sask.,
May 9th, 1911. 20-22

Contractors' Material
IN CANADA

Brown Locomotive Crane, 10-ton capacity, at 14 feet. Overhauled.

Canadian Rand New Giant Rock Drill, No. 431, tripods and weights.

Ingersoll "Little Giant" Rock Drill, No. 3¼, tripods and weights.

Cooper No. a Small Rock Drill, with tripod.

6 x 4 American Steam Pump, Valve, piping aad elbow.

New Size B Pulsometer Pump.

30 h.p. Upright Boiler, 46-in. x 10-in., Complete.

Screen for stone crusher, 24-in. x 6 ft.

Have you anything to sell? Write us.

THE MALES COMPANY,
82 Perin Bldg., Cincinnati, O.

Tenders
For
72-inch Steel Pipe

Intending tenderers for the supply of 72-inch steel pipe are hereby notified that delivery of pipe earlier than that called for in specifications will influence Board of Control when awarding contract.

G. R. GEARY, (Mayor),
Chairman Board of Control.

City Hall, Toronto, May 20, 1911. 21-21

Tenders
For
Waterworks Supplies, Etc.

TAVISTOCK, ONTARIO,

Sealed tenders addressed to the town clerk will be received up to 12 o'clock noon on **Wednesday, June 14, 1911,** for waterworks supplies and labor as follows:

Approrimately 2,250 feet of 8-inch, 2,550 feet of 6-inch and 2,100 feet of 4-inch cast iron water pipe, about 7 tons of special castings, about 16 hydrants, valves, etc. Also excavating for, laying and covering above pipe. One steel elevated tank.

Conditions and forms of tender, plans and specifications may be seen at the office of either of the undersigned.

Lowest or any tender not necessarily accepted.

F. W. FARNCOMB,
Consulting Engineer.
64 Bank of Toronto Chambers, London, Ont.
J. G. FIELD, Village Clerk.
Tavistock, Ont. 21-23

BOARD OF EDUCATION

Tenders Wanted

Sealed tenders addressed to the secretary-treasurer of the Board will be received until

MONDAY NOON, MAY 29th, 1911

for enlaagement of the following schools.

FERN AVENUE

OGDEN

ROEEN

Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied with an accepted bank cheque for 5 per cent. of the amount of tender or its equivalent in cash.

The lowest or any tender will not necessarily be accepted.

W. W. HODGSON, Chairman of Committee.
W. C. WILKINSON, Sec.-Treas.

Toronto, Ont., May 22. 21-22

Department of Railways and Canals

Ontario—St. Lawrence Canals
Murray Canal

Sealed tenders addressed to the undersigned and endorsed "Tender for Dredging Murray Canal," will be received at this office until 16 o'clock on **Wednesday, May 31.**

The specification and form of contract to be entered into can be seen on and after Friday, May 12, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Resident Engineer of the Ontario-St. Lawrence canals, Cornwall, at which places form of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $1,500 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the [illegible]

The cheque thus sent in will be returned to the respective contractors whose tenders are not [illegible]

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

[illegible]

By order,
L. K. JONES,
Secretary.

Department of Railways and Canal,
Ottawa, May 10, 1911.

Newspapers inserting this advertisement without authority from the Department will not be [illegible] 21-21

Tenders

For Telephone System

Tenders will be received up to noon on **Wednesday, May 31st, 1911,** by the secretary of the Advisory Board of The Brooke Municipal Telephone System for the construction of a system of rural telephone lines in the township if Brooke and adjoining townships.

Plans and specifications and all particulars may be obtained by application to the secretary at Alvinston, Ontario.

H. R. CARRUTHERS,
Secretary Advisory Board.
Alvinston, Ont. 6-6, 21-21

Tenders

For

Waterworks Supplies, Etc., Ridgetown, Ont.

Sealed tenders addressed to the Town Clerk will be received up to **Thursday, the 1st day of June, inclusive, 1911,** at 8 o'clock p.m., for Waterworks supplies and labor as follows:

Approximately 2,600 ft. of 8 inch, 6,400 ft. of 6-inch and 3,700 ft. of 4-inch cast iron water pipe, about 8 tons of special castings, about 35 hydrants, valves, etc. Also excavating for, laying and covering pipe. One steel elevated tank.

Conditions and forms of tender, plans and specifications may be seen at the office of either of the undersigned.

Lowest or any tender not necessarily accepted.

F. W. FARNCOMB, Consulting Engineer,
64 Bank of Toronto Building,
London, Ont.
D. COCHRANE, Town Clerk,
20-21 Ridgetown, Ont.

City of Fort William, Ont.

SALE OF MUNICIPAL PUMPING & ELECTRICAL GENERATING PLANT

Tenders in bulk or in part will be received by the city clerk, addressed to the Chairman of Utilities Committee, on or before the 1st day of July, 1911, for the sale of the following equipment:

2 Duplex Compound Northy Pumps, High pressure cylinder, 14 in. diam; low pressure cylnder, 20 in. diam; pump cylinder, 11 in. diam; stroke cylinder, 15 in. diam. Capacity of each, 600 gallons per minute.

1 tandem compound engine cylinders 21 in. x 46 in., and 40 in. x 46 in.

1 engine 20 in. x 46 in. with counter shafting pulleys and belting complete.

1 [illegible] phase, 60 cycles, 2400 volt generator with exciter, switchboard, etc.

1 royal electric 180 kw., 133 cycle, 2400 volt, generator with exciter, switchboard, etc.

[illegible] of 5,000 population.

[illegible] the city power house, Fort William.

The successful tenderer must be prepared to [illegible] before he **1st day of Sepember, 1911.**

[illegible]

[illegible]
City Engineer.

May 17, 1911. 21-23

TOWN OF SAULT STE. MARIE
Ontario

Sealed tenders addressed to W. H. Munro, mayor, will be received by C. J. Pim, town clerk, up to 5 p.m. **Monday, June 5, 1911,** for the construction of Section "M" of the sewer system. The approximate quantities are as follows:—

1. 4,600 lineal feet of 18 in. tile sewer.
2. 2,900 lineal feet of 15 in. tile sewer.
3. 4,500 lineal feet of 12 in. tile sewer.
4. 2,600 lineal feet of 10 in. tile sewer.
5. 4,400 lineal feet of 8 in. tile sewer.
6. Number of Manholes, 45.
7. Number of catchbasins, 67.

Plans, specifications and Form of Tender may be seen at the offiie of town engineer on or before **May 22, 1911.**

A marked cheque for the sum of $1,000 must accompany each tender.

The lowest or any tender not necessarily accepted.

W. H. MUNRO, Mayor.
W. F. GRANT, C.E., Town Engineer.
21-22

Department of Railways and Canals

Ontario—St. Lawrence Canals
Rapide Flat Canal

Sealed tenders addressed to the undersigned and endorsed "Tender for Improving Lower Extreme to Lock No. 24," will be received at this office until 16 o'clock on **Friday, June 9th.**

Plans, specifications, and Form of Contract to be entered into can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at tne office of the resident engineer of the Ontario—St. Lawrence Canals, Cornwall, at which places form of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $9,000.00 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

[illegible] due fulfilment of the contract to be entered into.

[illegible] cepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, May 19th, 1911.

[illegible] out authority from the Department will not be paid for it. 21-22

Tenders Wanted

[illegible] in connection with mid [illegible] separate schools for the [illegible] city of Toronto will be received till 5 p.m., **Wednesday, May 31st,** [illegible] 24 Duke street. Ten[illegible] Joseph Cadaret, chair[illegible] committee, and to be accompanied by a cheque for 10 per cent. of the amount of tender.

Specifications may be seen at the office of the [illegible] Charles J. Read, 101 Confederation [illegible] Ont. 21-21

Town of Oshawa, Ontario

Concrete Sidewalks

Tenders will be received up to noon of the **3rd day of June, 1911**, for the construction of 24,000 square feet (more or less) of cement concrete sidewalks on streets in the above town. Specifications and further information may be obtained at the office of the Town Engineer, Town Hall, Oshawa.

FRANK CHAPPELL,
Town Engineer.

Oshawa, Ont., May 20, 1911 21-22

TOWN OF ESTEVAN

Province of Saskatchewan

Notice to Contractors

Sealed tenders will be received by the Secretary-Treasurer of the Town of Estevan up to 8 p.m. on **Tuesday, June 6th, 1911,** for the following works:—

A.—Laying about 2,000 feet of water mains.
B.—Laying about 2,500 feet of sewer.
C.—Constructing about 85,000 square feet concrete walks.

The lowest or any tender not necessarily accepted.

For further information apply to the undersigned.

M. H. KING, Esq., Mayor.
L. A. DUNCAN, Esq. Secretary-Treasurer.
CHIPMAN & POWER, Engineers,

TOWNSHIP OF SCARBORO

Tenders

For Reinforced Concrete Arch Bridge

Tenders will be received by the undersigned up to twelve o'clock noon of **Monday, June 5, 1911,** for the construction of a reinforced concrete arch bridge of 20 ft. span over a branch of the Highland Creek, on the highway between lots 18 and 19, concession 2, township of Scarboro.

Pans and specifications may be seen and all necessary information may be obtained at the offices of the undersigned, 57 Adelaide street, east, Toronto.

The lowest or any tender not necessarily accepted.

BARBER & YOUNG,
Scarboro Township Engineers.

Toronto, May 19, 1911. 21-22

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

POSITION WANTED—As Superintendent or walking boss on railroad or other construction work, by experienced man who can furnish excellent references. Apply Box 271, Contract Record, Toronto, Ont.

Miscellaneous

Advertisements under this heading two cents per word per insertion.

WANTED—A large American manufacturer wants a good representative supply house in main cities of Canada to handle their line of A.C. and D.C. Watt Hour Meters. A good proposition. Address E. J. Macintyre, care Electrical News, 220 King street west, Toronto. 6-6, 19-20

Miscellaneous

Continued from page 63.

Edmonton, Alta.

Tenders for fire department apparatus and equipment addressed to the city commissioners, will be received until June 2nd. Specifications at the office of the chief, Fire Hall, No. 2 Fourth street.

East Kildonan, Man.

Tenders addressed to Alfred Jackson, Suite 3,522, Main street, secretary-treasurer, will be received until June 1st for supplying the material and construction of 860 feet 5-ft. wire fence and 1,100 feet 3-ft. 6-in. wire fence, with cedar posts. Specifications with above.

Fort George, B.C.

The board of trade is urging the immediate establishment of some system of fire protection for the town.

London, Ont.

Tenders addressed to the city clerk will be received until May 31, 1911, for; painting and repairs to combination wagon, No. 2; painting and repairs to old hook and ladder truck; new buggy; two Taylor and Forbes' 16-inch Lawn mowers; chief's auto—tenders for auto to submit specifications and print of their respective autos. Ald. H. Ashplant, chairman No. 3 committee.

Medicine Hat, Alta.

The question of providing an auto fire-fighting apparatus is receiving the attention of council.

Moose Jaw, Sask.

On May 26th four by-laws will be submitted as follows: $28,000, city's proportion of cement sidewalks; $35,000, extension of electric light system; $7,500, city's share of cost of ornamental street lighting standards; $170, permanent pavements, etc. Total, $240,500.

Newmarket, Ont.

Tenders for drawing and perhaps supply of gravel are received until June 1st by F. W. Keily.

Tenders addressed to W. C. Widdifield, solicitor for vendor, will be received until June 1st for purchase of timber, consisting of hemlock, maple, black, birch, elm and some cedar.

Ottawa, Ont.

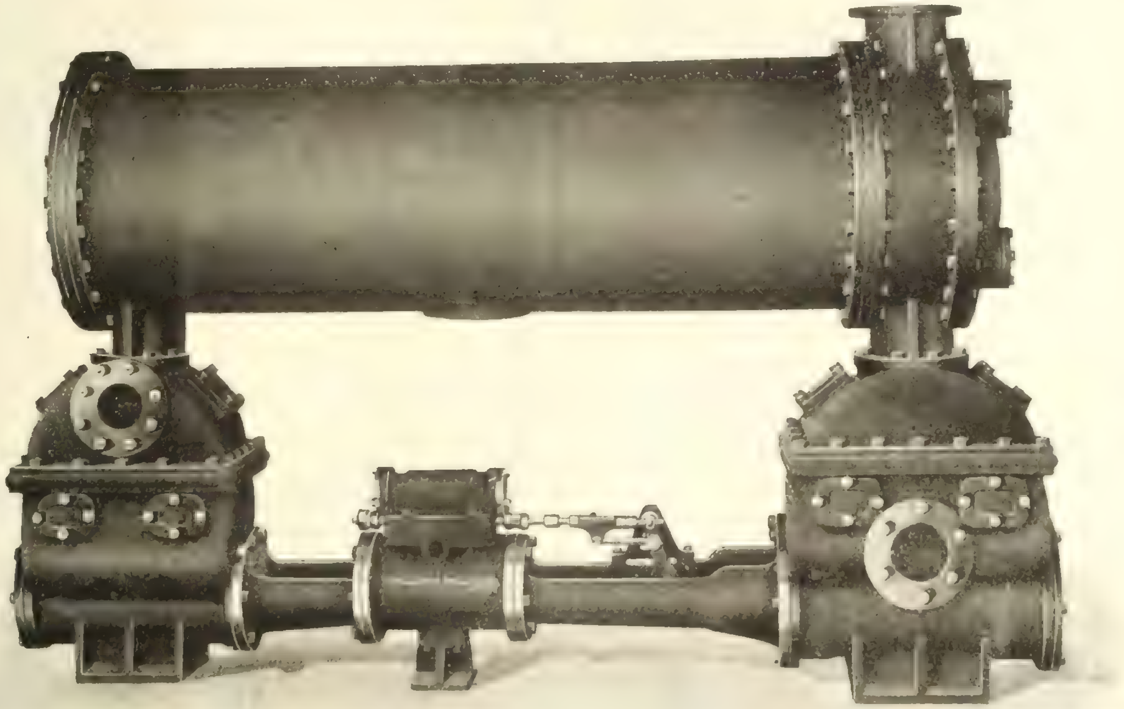
Tenders are called by Public Works Department until May 31st for dredging Murray Canal. Advertisement in "Tenders and For Sale Department" of this issue.

Tenders addressed to L. K. Jones, secretary, will be received until June 9th for improving lower entrance to Lock No. 24, St. Lawrence, Rapide Flat Canal. Advertisement in "Tenders and For Sale Department" of this issue.

Toronto, Ont.

Recent building permits include: John Drake, two pr. semi-det. 2-storey brick dwellings, Herman, $8,000; L. Rolstein, one pr. semi-det. 2-storey and attic brick dwelling, east side Keele, $7,000; J. Bollons, one pr. semi-det. 2-storey and attic brick dwellings Hewitt, $6,000; A. Chisholm, 2-storey brick stores and offices, 1685-7 Dundas, $15,000; Dodge Mfg. Co., 3-storey brick storage warehouse, Pelham, $26,000; E. E. Varey, 2-storey and attic brick dwelling, opposite Nina, Lyndhurst, $7,000; Grimshaw Bros., three pr. semi-det. 2-storey brick dwellings, Woodbine ave., $11,400; L. Rolstein, one pr. semi-det. 2-storey and attic brick dwellings, east side Keele, $6,000; W. B. Isbister, one pr. semi-det. 2-storey brick dwellings, Dufferin street, $4,000; R. C. Bustard, two pr. semi-det. 2½-storey brick dwellings, St. Clair, $12,000; Ontario Dock Co., 2-storey gal. iron freight shed, foot of York st., $15,000; Thompson & Mitchell, one pr. semi-det. 2-storey brick dwellings, Montrose, $4,400; Mr. Hayhow, one pr. semi-det. 2-storey and attic brick dwelling, 282-4 Ossington, $4,800; E. G. Switzer, one pr. semi-det. 2-storey and attic brick dwelling, Hewitt avenue, $5,000; R. S. Smith, one pr. semi-det. 2-storey brick dwellings, northeast corner Queen Q Triller, $4,500; L. A. Beatty, one pr. semi-det. 2½-storey brick dwellings $5,000; G. Fordyce, one pr. semi-det. 2-storey and attic brick dwellings, Brighton, $4,800; E. Elliott, two pr. semi-det. 2½-storey brick dwellings, Manning avenue, $9,000; S. W. Joseling, 2-storey brick dwelling, Tyndall ave., $4,500! Hedley & Bradford, one pr. semi-det. 2-storey brick dwellings, Marguerетta, $4,000; A. Mundy, one pr. semi-det. 2-storey brick dwellings, Perth, $4,000; Britingham & Patterson, two det. 2½-storey brick dwellings, Wright avenue, $6,000; **Adath Israel** Congregation, 2-storey brick synagogue, 50 Centre avenue, $9,000; Copland Brewing Co., 1-storey brick warehouse, 311 King street east, $6,500; D. Muirhead, 2 pr. semi-det. 2-storey brick dwellings, Logan avenue, $7,600; Norman Seagram, 2-storey and attic brirk addition to dwelling, 217 St. George, $10,000; Bell & Brown, two pr. semi-det. 2-storey brick dwellings Hwrman, $6,000; G. M. West (in trust) one pr. semi-det. 2-storey and attic brick dwelling,, Logan avenue, $4,400; Hayes & Coldwell, two pr. semi-det. 2½-storey brick dwellings, Strathcona, $7,600 E. C. Berkinshaw, 2½-storey brick dwelling, west side Russell Hill road, $6,500; John Edwards, one pr. semi-det. 2-storey brick dwellings, west side Perth, $4,000; J. A. Scythes, 2-storey and attic brick dwelling, near Marmaduke, Indian road, $4,000; C. Locke & Son, two pr. semi-det. 2½-storey brick dwellings, south side College, $10,000; J. Singer, one pr. semi-det. 2-storey brick dwellings, 198 John street, $4,800; H. Graham, one pr. semi-det. 2½-storey brick dwellings, 212-212½ Delaware, $5,000.

Condensors



Condensor built by The John Inglis Co., Limited

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

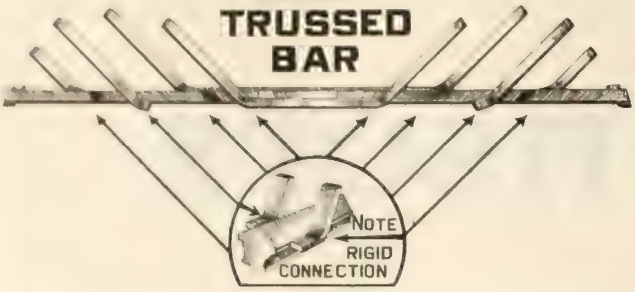
Let us Submit Prices.

The John Inglis Company

Engineers and Boilermakers **Limited**

14 Strachan Ave., TORONTO, Canada

KAHN TRUSSED BAR



Is an economical distribution of steel in the concrete. Increases the strength of a concrete beam from 20 to 33⅓%.
Saves labor in placing and eliminates mistakes.
No bending to be done or wiring of stirrups.

OTHER PRODUCTS

RIB - BAR — A rolled deformed bar, ultimate strength up to 90,000.
RIB-METAL—Steel mesh reinforcement for floors and roofs.
HY - RIB — Self centering reinforcement for floors, walls, partitions.
UNITED STEEL SASH—Strong, rigid, economical, fireproof and allows maximum light.
TRUS-CON.—Chemical Products—for finishing and waterproofing concrete surfaces.

Trussed Concrete Steel Co.
of Canada, Limited

Head Office:
Walkerville

Branches:
Toronto, Winnipeg,
Montreal, Vancouver.

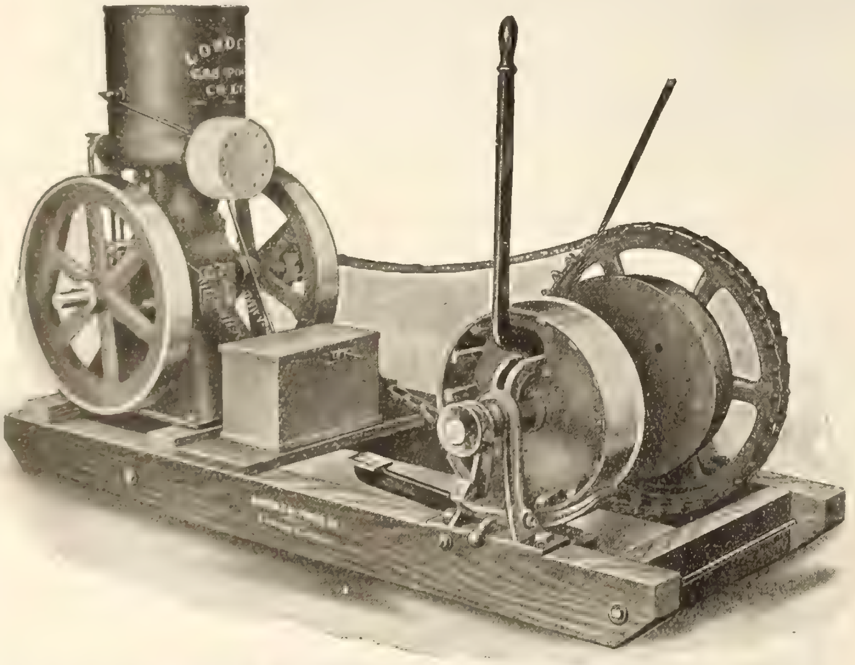
Agencies:
Quebec,
Halifax.

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg



Complete 5 H. P. Hoisting Outfit, Operating Side

Here is a Hoisting Outfit that Has Saved Money Let it Save Yours

A **"London"** self contained engine mounted on the strong bolted frame with our famous **"London" Friction Clutch Hoist** with ball bearing thrust, will give you an outfit hard to beat.

The gearing consists of sprockets and heavy malleable iron chain.

Send for our Literature which contains complete description of the above outfit.

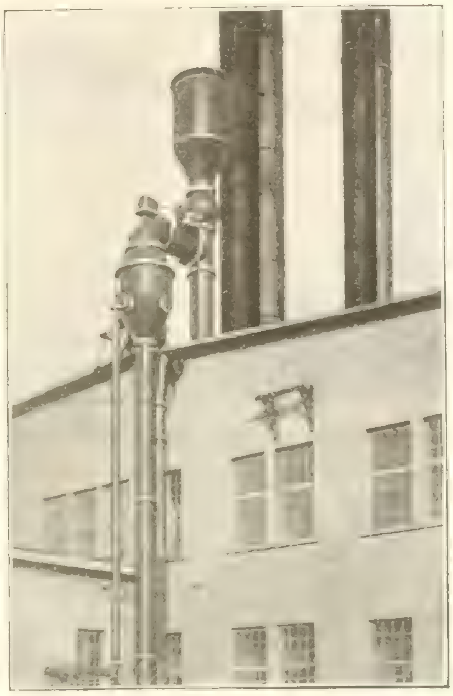
The London Gas Power Company Limited, London, Canada
ENGINEERS and MACHINISTS

CONDENSING APPARATUS

The Condenser is as old as the steam engine itself, but has until very recently received far less consideration and has been treated as an auxiliary, the reliable working and efficiency of which had but little bearing upon the economy of the plant as a whole.

With the advent of the steam turbine and the demand for higher economies, the importance of the condensing apparatus has become more clearly apparent, and it now holds its rightful place as one of the principal parts of the steam plant.

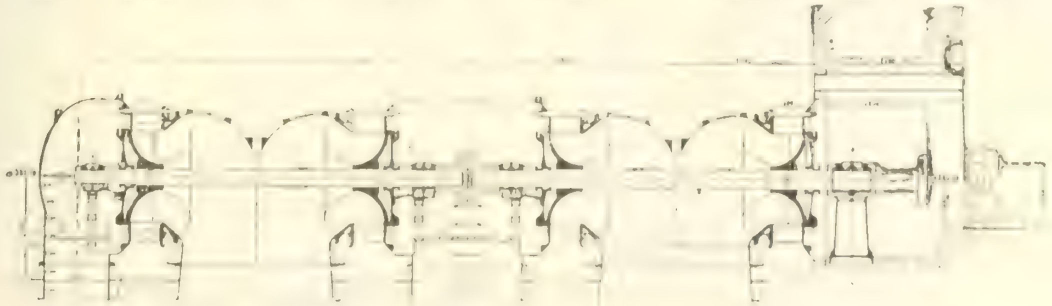
We get the best results by designing and building condensing apparatus specially to suit the conditions of operation.



THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.
LIMITED
Works—512 William Street, MONTREAL
Sales Offices—Montreal, Toronto, Winnipeg, Cobalt, Calgary, Vancouver

WATER-POWER PLANTS
LOW PRESSURE TURBINES

Any Output. 5,000 Turbines Supplied. 2,000,000 Horse Power.



26 ft. Head. 5,000 H. P.
Four Units as illustration on order for the German-Swiss Water Power Company

ESCHER WYSS & CO. - ZURICH, SWITZERLAND
CANADIAN HEAD OFFICE, 408 LUMSDEN BUILDING, TORONTO
PHONE, ADELAIDE 234

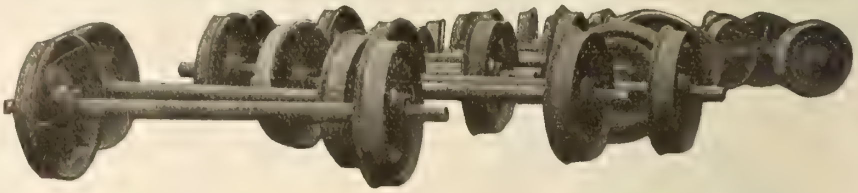
RAILWAY CONSTRUCTION PLANT

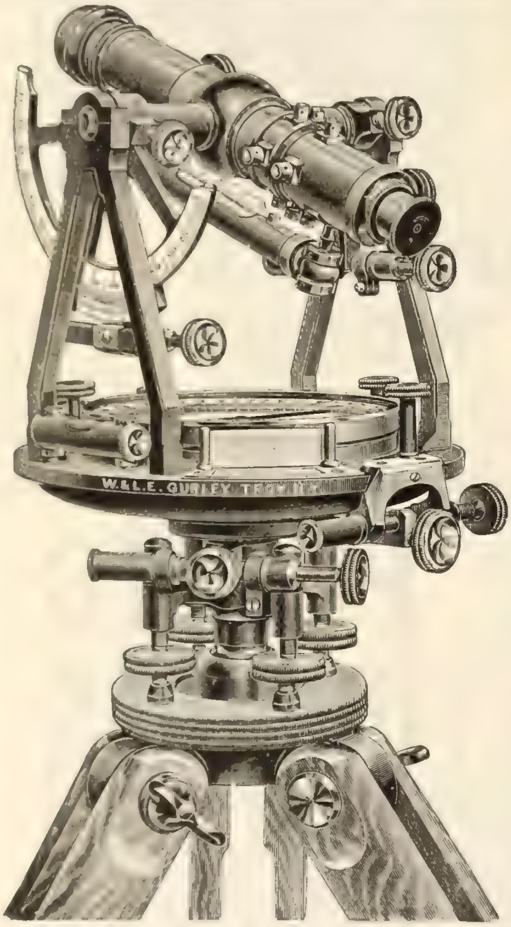
Hoisting Engines, Horse Powers, Hand Winches, Derricks, Car Wheels, Axles and Boxes, Dump Cars, Rail Cars, Buckets

MARSH & HENTHORN, Limited
Makers of Hoisting Machinery, BELLEVILLE, ONT.

Send for Catalogue

SALES AGENTS
MUSSENS
LIMITED
Montreal, Que.





1845 1911

W. & L. E. Gurley
TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

Transits
Y Levels
Compasses
Plane Tables
Current Meters
Levelling Rods
Chains
Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

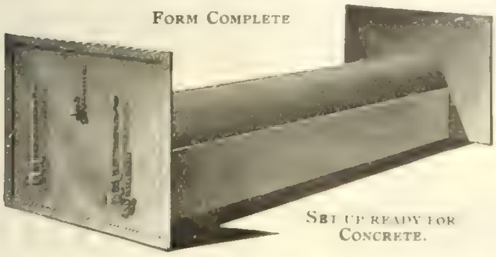
Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES
Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.



Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

WRITE FOR FORM CATALOGUE
ENGINE CATALOGUE FOR THE ASKING
COMMISSIONER'S TIME BOOK FREE

Concrete Form & Engine Co.

Successor to Collapsible Steel Form Co.

83 Congress St., W., Detroit, Mich.

"The durability of a building is the gauge of its value from an economic standpoint."

—The Philosopher of Metal Town.

Absolute perfection in workmanship and quality of material used is the reason for the superiority of our

Corrugated Sheets

Only the best quality COLD ROLLED steel is used—a much tougher and finer material than the hot rolled article.

Each sheet is accurately squared and the corrugations PRESSED one at a time—not rolled—giving an exact fit without waste.

Specify our corrugated sheets and know that you are getting the best—the strongest and most durable on the market.

Flat or curved—galvanized or painted. Any size or gauge

Our special prices on car lots will interest you. Send for our new catalogue No. 70—it contains interesting information on Metallic Building Materials.

Manufacturers

195

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City

DOORS

Pine and Hardwood Veneer

Interior Finish

Stair Work

Interior Hardwoods

[illegible]

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario

WHEN YOU THINK OF METAL CEILING THINK OF "GALT"

"Galt" Art Metal Ceilings are sold strictly on their merits, their **mechanical superiority** and faithfulness to art in styles they typify.

Machine-cut beads (patented process) make them easy to apply. Plates snap into place and seams fit snugly together. Why waste your time puttying and peening the joints on old-fashioned stuff when the new is here and costs less?

Write us about your Metal Ceiling work

THE GALT ART METAL CO.,
GALT - ONT.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange

A Good Belt Dressing for
Leather or Textile Belts

Federal Engineering & Supplies, Ltd.

284 Yonge Street, Toronto
329 St. James St., Montreal

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U.S.A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

The Smith Marble and Construction Co., Ltd.

Montreal

Office & Factory:
145 Van Horn Ave.

Show Rooms:
458 Blury Street

Importers, Manufacturers, Contractors

OF

Interior and Exterior Marble, Slate, Floor and Wall Tiles, Mosaics, Plumers and Electrical Marble, Granites for Building and Monumental Work.

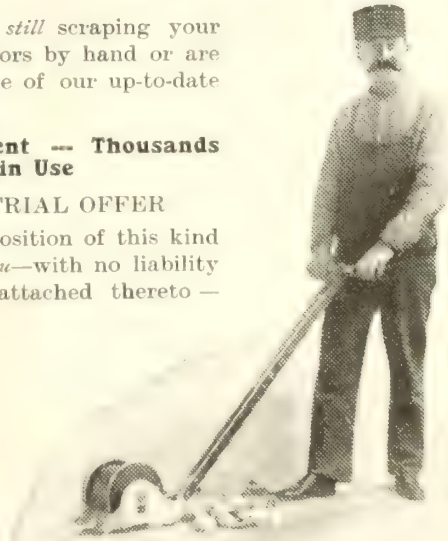
The Contractor's "Money Saver"

Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment — Thousands in Use

FREE TRIAL OFFER

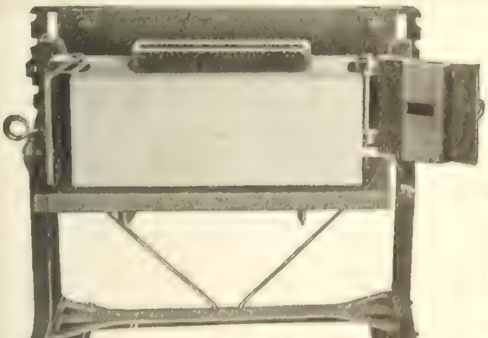
If a proposition of this kind appeals to *you*—with no liability or expense attached thereto — write us **to-day.**



MACHINE
PAYS FOR
ITSELF
IN A FEW
DAYS.

"Little Giant Floor Scraper"

Hurley Machine Co. Limited
Atlantic Avenue - Toronto



Improved Singer No. 4 Block Machine

Our Catalogue K [illegible] information and [illegible]

It Makes

Face Down Blocks

Blocks 4", 6", 8", 10", 12", 16" and 24" long 4", 6", 8", 10" and 12" wide.

All Blocks on One-size Pallet.

[illegible]

Vining Mfg. Co.
Niagara Falls, Ont.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President
Thos. C. Irving Jr., Vice-Pres.
Jas. W. Morgan, Secretary
Chas. Warnock, Treas. & Mgr.

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, CANADIAN EXPRESS BLDG., MONTREAL, QUE.
Branch Offices: TRADERS BANK BUILDING, TORONTO, ONT.
Norfolk House, Laurence Pountney Hill, London, E.C.

Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's New Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

is a **continuous** concrete reinforcement. Even transverse continuity is secured without lap. Hooks attach the adjacent strips together.

Did you ever stop to consider the cost of the lapped portions of non-continuous reinforcement? Or the consequence of too much economy in this direction?

For spans up to eight feet there is no better reinforcement than **Perfection Wire Mesh.**

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

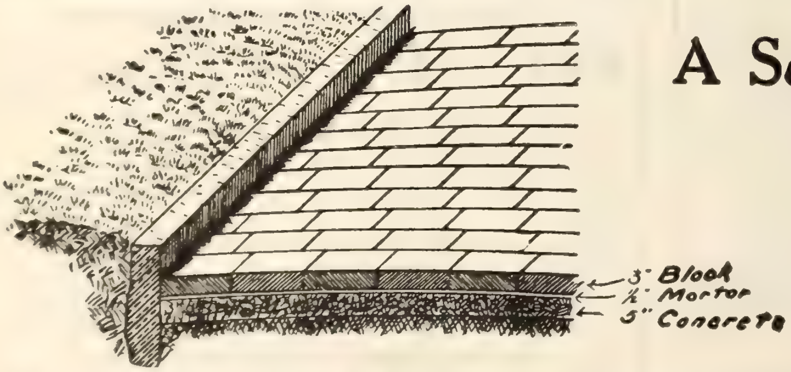
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Lap Welded Steel Pipe

MADE IN SIZES

12 to 72 inches Diameter

Used extensively for Water Supply for Mines, Mills, Hydraulic Operations and High Pressure Hydro Electric Installations.

Ask our Welded Pipe Dept. for prices.

American Spiral Pipe Works

MANUFACTURERS OF

SPIRAL RIVETED PIPE LAP WELDED PIPE
FORGED STEEL FLANGES

50 Church St. New York Box 485 Chicago, Ill.

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)

"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."

W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.

1032 Garfield Building, CLEVELAND, OHIO

SELLING AGENTS

The Dominion Equipment & Supply Co., Winnipeg, Canada

Are You Interested
in

Concrete Construction

The latest method in this work for making concrete tougher waterproof and a better color is to incorporate in your mixture

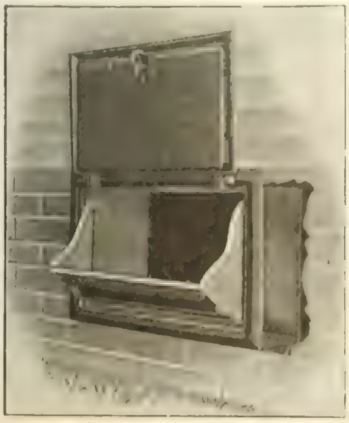
Guelph Hydrated Lime

This lime is very fine and fills all voids. It also prevents the concrete from drying too rapidly.

Specify **Guelph Hydrated Lime** for your next job, its the coming for use with cement.

Standard White Lime Co.

Guelph - Ontario



EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No 1—22 x 16 x 13 No 2—27 x 16 x 13 No. 3—33 x 22 x 18

Send for our illustrated booklet [illegible] Coal Chutes.

The Down Draft Furnace Co., Limited

Galt, Ontario, Can.

The Meaford Wheelbarrow Co., Limited

MEAFORD, ONT.

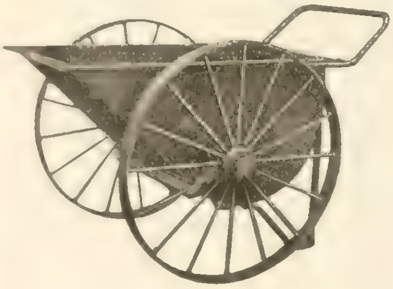
Manufacturers of

Wheelbarrows of every description, for every purpose. If it is a Wheelbarrow you want we have it in Railroad or Navy, Steel Tray or all Steel, Garden or Lawn.

Wheel Scrapers, pressed bowl or square box in two sizes Nos. 2 and 3.

Drag Scrapers, pressed steel handles on top or sides, with or without runners.

Ox Shovels, Fresno or **Buck Scrapers**

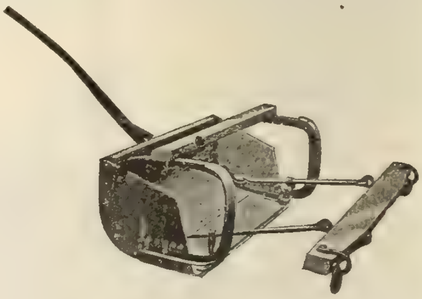


Dump Carts, Dump Cars, Grading Ploughs

Trucks, Bag, Warehouse, Platform

Sterling line of Roller Bearing easy pushing Concrete Wheelbarrows and Carts

Write for prices and complete catalogue



THE MILTON PRESSED BRICK Co. LIMITED

MPBCo

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

We are Agents for the Fiske Tapestry Brick, suitable for high-class residential work. At our Toronto Office we have set up panels of the different color schemes and would be pleased to have you call and examine them.

Head Office: Milton, Ont. **Toronto Office: Janes Building**

EADIE-DOUGLAS LIMITED, Ottawa Agents

Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

IRON STAIRS

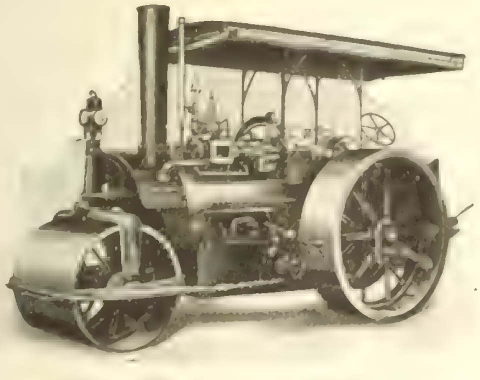
Dennis Wire & Iron Works Co.
London, Canada Limited

Toronto Offices - 12 QUEEN STREET E.

Cut shows a four wheel steam Locomotive Crane with [illegible] ft. boom handling forms on New York Catskill Aqueduct at Valhalla, N.Y. These contractors are finding our cranes indispensable in this work, as they can be used for so many purposes; such as handling loose materials as broken stone, sand, concrete, etc., heavy timbers, rails, concrete forms, etc.

THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City

There are over 100 Waterous Rollers in use in Canada to-day



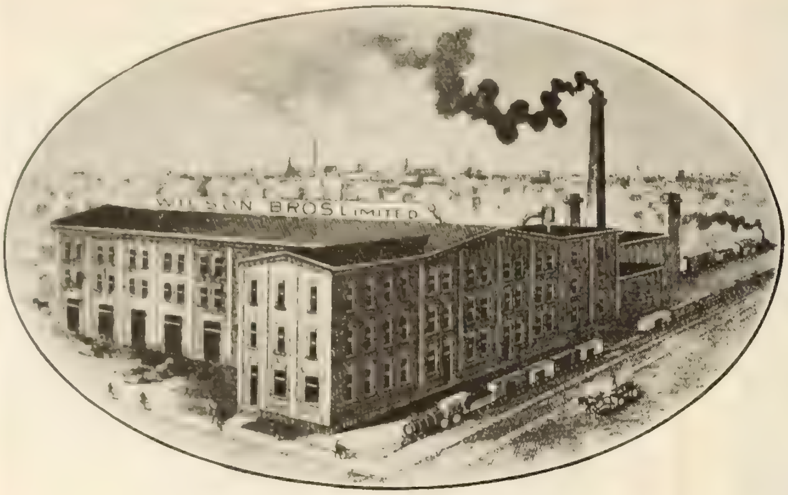
The Waterous Roller
"A Canadian Roller for Canadian Roads."

That means that there is at least one in use in every province in the Dominion, working on all kinds of roads, under all sorts of conditions. Their universal success proves their right to the title "The Canadian Good Roads Pioneer."

The Waterous Roller is built in three sizes, 10, 12 and 15 tons. Carries a double crank engine, a quick-steaming locomotive type boiler of large capacity has two speed gearing cut from the solid steel for fast and slow work. Supplied with all standard engine and boiler fittings.

If there is no Waterous Roller in your neighborhood, write for our complete Roller catalogue No. 301 or visit us at our Brantford works and see the Roller being build and tested-- a practical demonstration that is its best selling argument

The Waterous Engine Works Co., Limited
Brantford - Canada



Hardwood Flooring and Interior Finish

"WILSON BROS. LIMITED" on flooring means a carefully kiln dried and well manufactured article. Our flooring is straightened, hollow-backed, bored, end-matched, steel polished and bundled. -:- -:- -:-

We specialize in Veneered Doors to detail.

Wilson Bros. Limited **COLLINGWOOD, ONT.**

The Mushroom System

Of Reinforced Concrete is strong, economical and durable. Based on scientific principles, every pound of steel does the work it is designed to do.

The system is fully covered by broad patents in Canada, the United States, and all civilized foreign countries.

For lists of buildings, descriptive literature and estimates, address

C. A. P. Turner, M. Am. Soc. C. E.
816 Phœnix Building, Minneapolis, Minn.

TENTS
for Engineers and Contractors

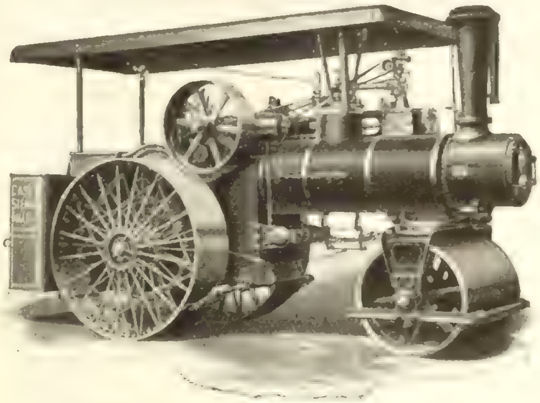
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

Woods Limited
Woods Building - Ottawa, Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT
THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18" x 26" cylinder Mogul, Standard Gauge, and 18-10" x 14" Vulcan and Davenport dinkeys, 36" Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36" Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8" Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2 Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	Drag Scrapers an 1—Wheel Scrapers.
MISCELLANEOUS	3 Plows, 6 Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36" Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW

May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. & Dolland Lane - - MONTREAL, CANADA

Sand and Gravel

Lime
Cement
Plaster
Hair
Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C.P.R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

RECIPROCITY

means to exchange. We have high quality fittings, you have good money. Lets get together.

S BRAND

Cast Iron Fittings and Valves are Right

"Everlasting" Blow-off Valve
SIMPLE — DURABLE — EFFICIENT

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

**Reinforced
Concrete
Construction**

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

The Leading

FIRE BRICK

Of The World

GLENBOIG GARTCOSH

For use in iron and steel works, foundries, railroad shops and by all furnace users. They possess the three qualities of a perfect fire brick. First, no melting. Second, no cracking and splitting off. Third, high reflective power.

Stocks carried by all principal dealers

MAKER'S SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The

Missisquoi Marble Company

Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd.	Toronto, Ont.
C. N. Barclay	Winnipeg Man.
Bosse & Banks	Quebec, Que.
General Contractors Supply Company, Ltd.	Halifax, N. S.
129 Sparks Street	Ottawa, Ont.
James Robertson Co. Ltd.	St. John, N. B.
G. R. Duncan	Fort William, Ont.
Walker & Barnes	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd.	Vancouver, B. C.
315 Coristine Building	Montreal, Que.

Pine Doors

The kind that don't sag and warp

W have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Limited

Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

BUILDERS' SUPPLIES

Mouldings Turnings
"Empire Brand" Hardwood Flooring
Stair Building
Interior Trim
Sash
Veneered Doors
Pine Doors

J. R. Eaton & Sons

Limited
Orillia, Ontario

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A.

Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

The Low Charging CROPP MIXER

The only Mixer that will not spill when overcharged

Low charge and high discharge covered by Patent 947196.

Either Steam or Gasoline Engine

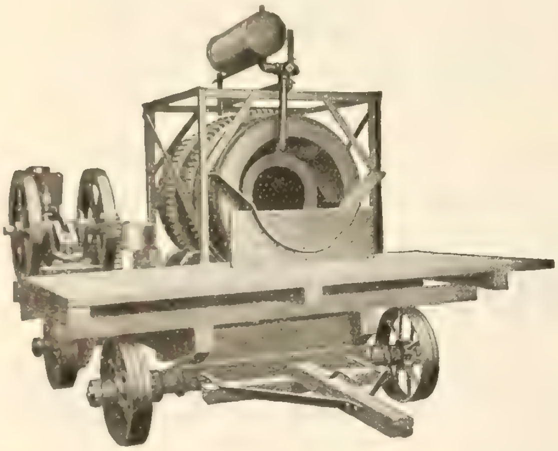
Our Prices will Interest You

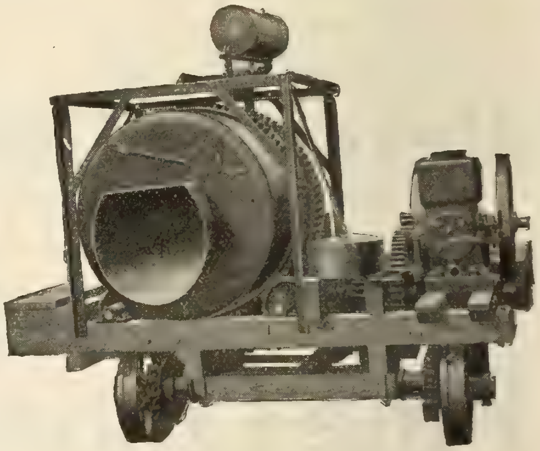
The only mixer having batch constantly in sight of operator.

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries





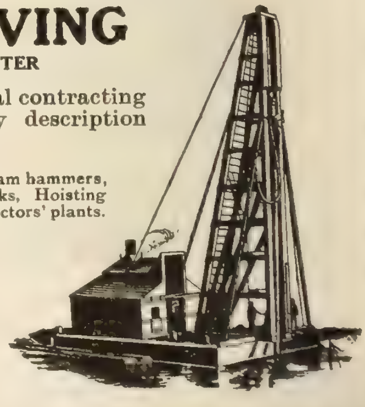
THE
Thames Quarry Co.
St. Mary's, Ont.
CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux
JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.



A STRONG TESTIMONIAL

"Best Paving Block Made"

Quality is Economy
in Paving Brick

Kalamazoo, Michigan, U. S. A.,
June 13, 1910.

"We used Metropolitan Block in 1895 and the best recommend I can give is that we have used many more of them nearly every year since."

(Signed) H. A. Johnston,
City Engineer.

"Metropolitan Block"
Make Permanent Pavements

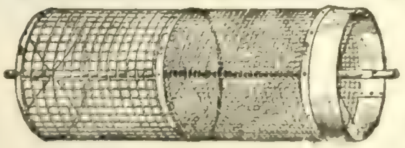
The Metropolitan Paving Brick Co. - Canton, Ohio

Established [illegible]
THE COMMERCIAL
The Weekly Financial, Commercial & General Trade Newspaper of the Great West.
Winnipeg, Manitoba

JAMES BRODIE & CO.
Quarriers and Manufacturers of
Canadian Quinsy, Ebony and Stanstead Granite
Monumental Building, Curbing, Paving, etc. Rough Stock a Specialty
IBERVILLE, QUE.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.
Locomotives and Cars
JOHN J. GARTSHORE
58 Front Street W., TORONTO

We manufacture
Revolving Screens

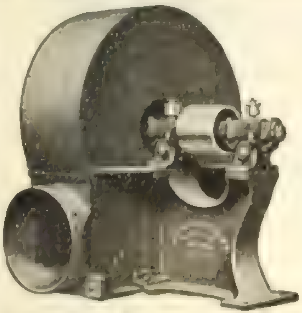


and anything in the screen line.
Also railings, wire guards, grills etc.
Electro-plating and all metal finishes.
Estimates Given - Send for Catalogue
Crescent Wire & Iron Works
Partridge & Sons KINGSTON

Geo. M. Miller & Co.
Architects
Toronto General Trust Building TORONTO

Power & Son,
Architects and Building Surveyors
Merchants Bank Chambers,
Kingston, Canada

Taylor, Hogle & Davis
(Taylor & Gordon.)
Architects
North British & Mercantile Chambers
80 St. Francois Xavier St., Montreal
Telephone Main 281



Sturtevant
Stock Fans

Embrace such a diversity of types and sizes that nearly any ordinary conditions of fan engineering may be met by a fan shipped from stock.

Spare parts always ready for immediate shipment.

STURTEVANT Engineers suggest and recommend apparatus to meet requirements.

ASK THEM. 863

B. F. STURTEVANT, Hyde Park, Mass.
Polson Iron Works Ltd., Toronto Eadie-Douglas Ltd., Montreal

TENDERS
For Roofing and Sheet Metal Work
in all parts of Canada
Communicate with
A. Schwoerer & Sons, Inc.
530-34 E. 80th St. New York, N.Y.
Now working in Winnipeg, Regina, Vancouver, Montreal and Ottawa

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge
and
Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS SUPPLIES

WATER WASHED SAND

OUR SPECIALTY

Dealers in
Sand and Gravel
Crushed Granite
Crushed Stone

SAND
&
SUPPLIES, LTD.
TORONTO

The
Phœnix Bridge & Iron Works Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

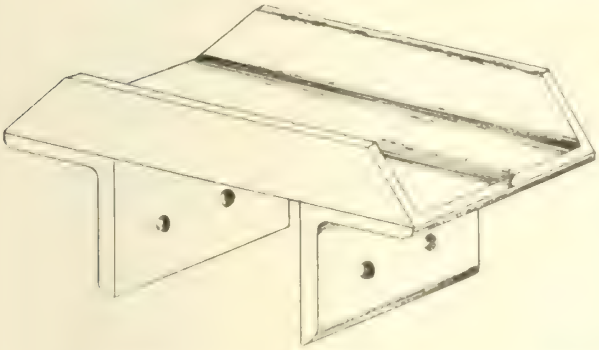
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

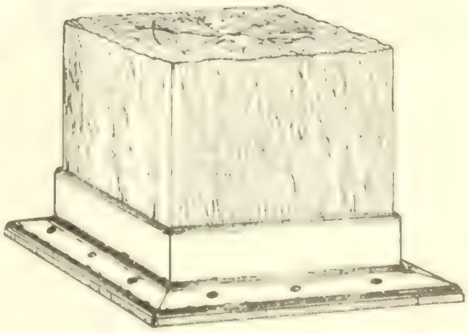
Wm. McNally & Co. - Montreal

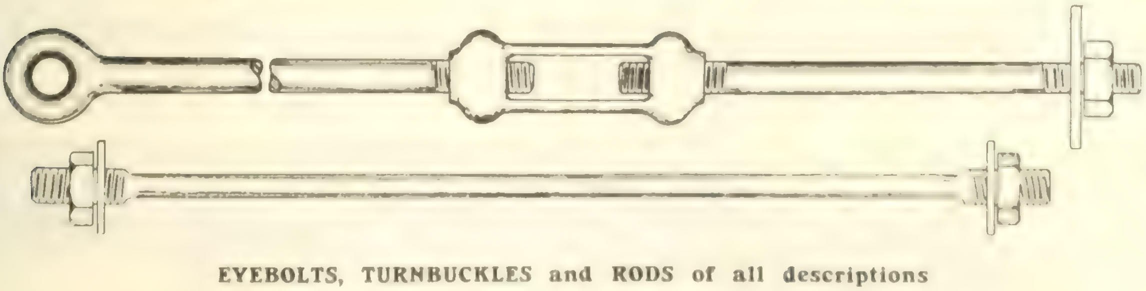
The Hamilton Bridge Works Company Limited

Hamilton, Canada



STEEL POST CAPS and BASES for Wooden Posts, any size. Also made in Cast Iron





EYEBOLTS, TURNBUCKLES and RODS of all descriptions

Beams, Angles, Channels, Plates, any size from 1½ inch to 24 inches, and any length up to 70 feet

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O. BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners

Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

JAMES THOMSON, President. J. G. ALLAN Vice-President. JAMES A. THOMSON, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.

LIMITED

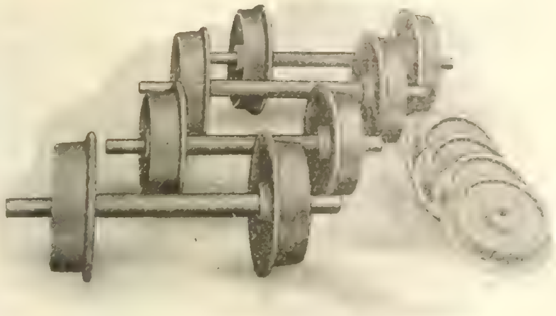
Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.



The making of Car Wheels for Construction Cars and putting the material at a point where it is most needed, is part of our business.

Write our nearest plant for further information as to prices, deliveries, etc.

The Canada Iron Corporation
Limited

Montreal, Que. Three Rivers, Que. St. Thomas, Ont.
Hamilton, Ont. Midland, Ont. Fort William, Ont.
Londonderry, N. S.

PROMPT DELIVERIES

Fellowes and Fellowes
59 Yonge Street., TORONTO
Engineers' and Contractors' Machinery

Steel Dump Cars, Hoisting Engines, Derricks Pumps, new and second hand Rails and Cars, Turntables, Clam Shell and Orange Peel Buckets, etc. Contractors' Elevating and Conveying Machinery.

Phone Main 6805—6806
The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE
The Ready Mixed
Hard Wall Plaster
Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"
Conduits
for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited
LARGEST MANUFACTURERS IN CANADA OF

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments Works and Offices: Ashbridge's Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street East, MONTREAL

John. T. Farmer

MECHANICAL AND HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.

A.M. Can. Soc. C.E. A.M. Am. Soc. C.E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C.E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 413, Pacific Block, Vancouver, B. C.

CONCRETE BARGES

SPECIFICATIONS AND PLANS OF

Reinforced Concrete Barges, Pontoons and Scows

PREPARED BY **James Taylor,**

CONSULTING AND INSPECTING ENGINEER, MONTREAL

P.O. Box 95, Station B Enquiries Invited

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Toronto and Winnipeg

John Galt John Haddin

Allan Keefer

Architect

Ottawa, Ontario

Arthur L. Weeks

Architect

Canada Life Building, Ottawa

Reinforced concrete and steel structures. factories and commercial buildings

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. Montreal

Bell Tel. M. 4354

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	...	15.00
91 to 95 "	...	17.50
Brass Goods, Valves, etc.		
96 to 100 "	...	20.50
101 to 105 "	...	24.00
106 to 110 "	...	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single Mont'l.	Single W'p'g.	Double Mont'l.	Double W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	...	...	14.00	10.50
90 u. i.	...	...	16.50	11.50
95 u. i.	...	...	18.00	13.50
100 u. i.	...	...	20.00	16.00

50-foot boxes at Montreal. 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic. any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent; roundway, 60 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; [illegible] traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Churshed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 40 cents per foot.

Rubble stone in car lots, $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered f.o.b. Toronto.

Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.

Lime, per cwt., delivered, 38 cents.

Plaster of Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

Boiled Linseed Oil, in barrels, $1.23 per gallon lon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, $1.20 per gallon.

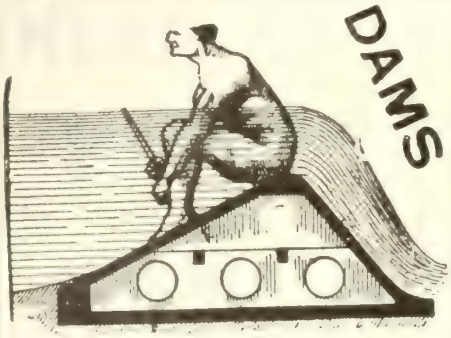
Pure Linseed Oil Putty, 25-lb. tins, $4.00 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.50 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs

Bonds of Suretyship for Officers and Employees in positions of trust.
Bonds Bid and Supply in lieu of Certified Cheques [illegible] Tendering or Contracting for the Furnishing of Supplies.
The
Guarantee Company of North America
[illegible]
Head Office - Montreal
Capital and Resources over - $1 965,000
Claims Paid over - - - $2 265,000
[illegible]
[illegible]

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS, General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

STEEL AND RADIATION, LIMITED

"Comfort in Winter"

and freedom from every kind of worry falls to the lot of a man who installs a

"KING"

Boilers and Radiators

Investigate our Claims

SOME SPECIAL FEATURES

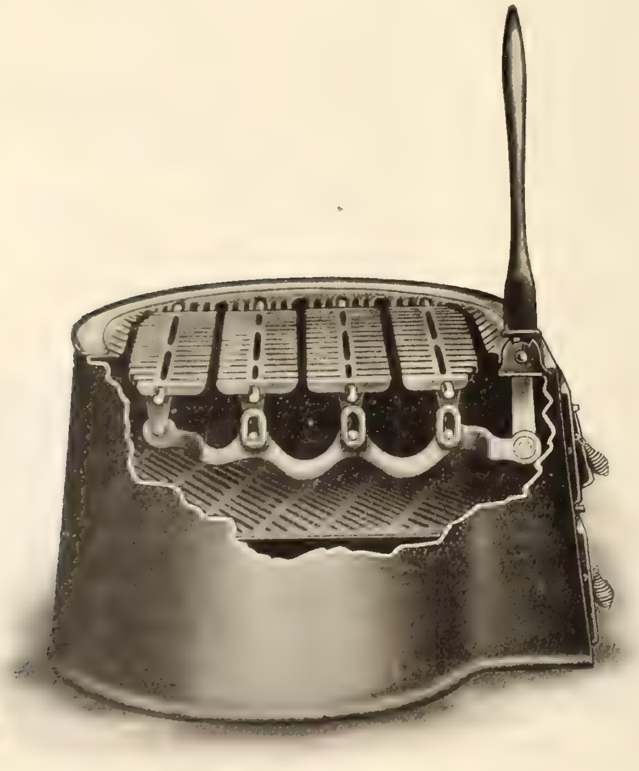
1. A CORRUGATED Fire Pot, that increases its Heating Surface ONE THIRD.

2. Specially arranged combustion chambers and staggered Flues which compel all gases to be burned INSIDE the boiler instead of escaping to the chimney.

3. NO BOLTS, PINS OR NUTS

   A Grate that burns ALL the coal to a clean ash, and a SHAKING APPARATUS, the mechanism of which is so simple that a child can operate it equally as well as an adult (SEE ILLUSTRATION.

No. 3½ KING Boiler



KING Ashpit Showing Grate Bar Mechanism

"KING" Boilers

are made in HALF SIZES, making it possible to specify closely to actual requirements.

"KING" Radiators

"KING" Radiators are well and favorably known, and installed in conjunction with "KING" Boilers insure a comfortably heated home.

Insist on having "KING" Boilers and Radiators Specified

Write for our Descriptive Booklet, Comfortable Homes

STEEL & RADIATION
LIMITED
FRASER AVENUE
TORONTO - CANADA

AGENTS IN ALL LEADING CITIES

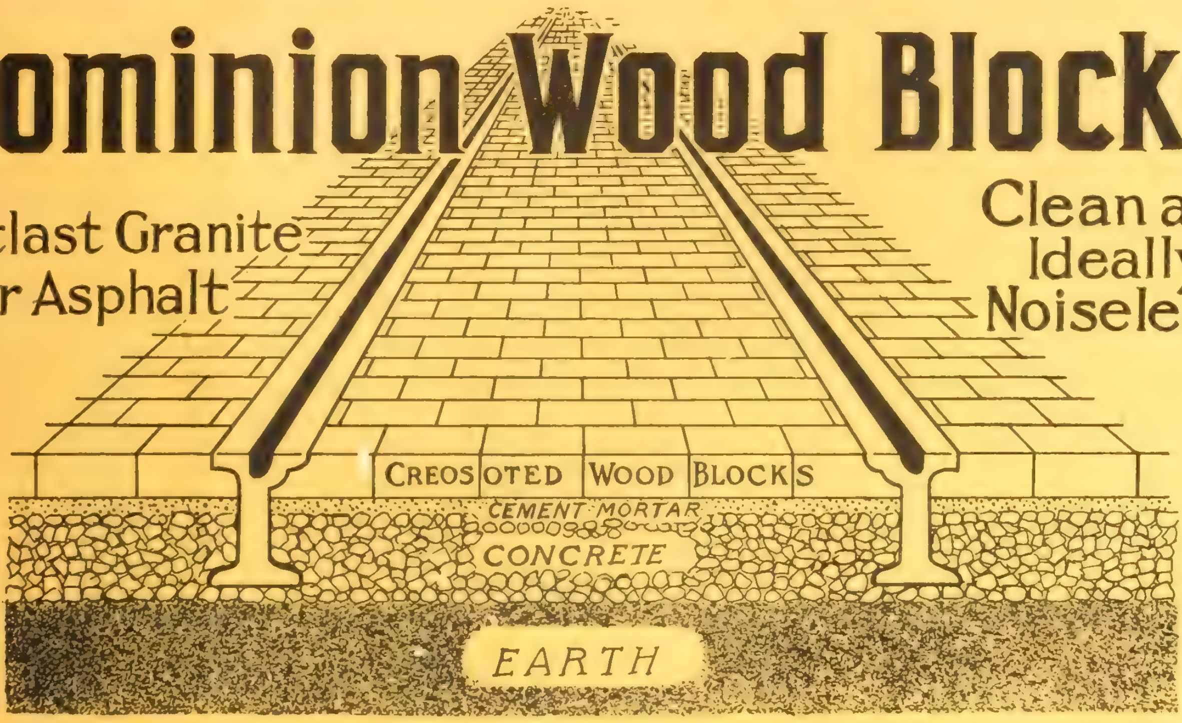
Toronto Showrooms:
80 Adelaide St. East
92 King St. West

Montreal Showrooms
and Sales Office:
138 Craig St. West

Dominion Wood Blocks

Outlast Granite or Asphalt

Clean and Ideally Noiseless



Dominion Wood Blocks

make the most durable pavement for all classes of service, from the lighest wear of boulevard vehicles to the grinding of the heaviest trucking traffic. It is the one pavement that won't need the annual attention of the repair gang and will pass out of reserve in perfect condition.

Don't put your money in a pavement that will need patching before the final payment is made on the assessment.

Dominion Carbolineum Works LIMITED
Vancouver, B.C.

"Some Equipment With Merit"

FOR THE CONTRACTOR

"Kilbourne & Jacobs" Pressed Bowl Wheelscrapers

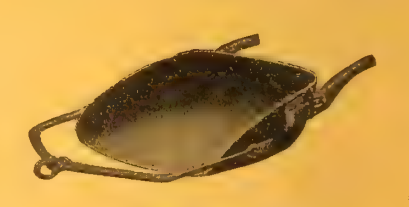
are the very best that can be purchased anywhere. They are the only perfect wheelscraper. The best, strongest and easiest working Scraper ever put on the market.

We carry a full stock of all sizes for immediate shipment

"Columbus" Scraper

"K & J" DRAG SCRAPERS

In all sizes



"Boss" Scraper

Our scrapers are the leading drag scrapers everywhere. All our scrapers are absolutely seamless throughout and are superior to any others upon the market.

We want your inquiry when in the market—Prompt shipment from stock

F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.

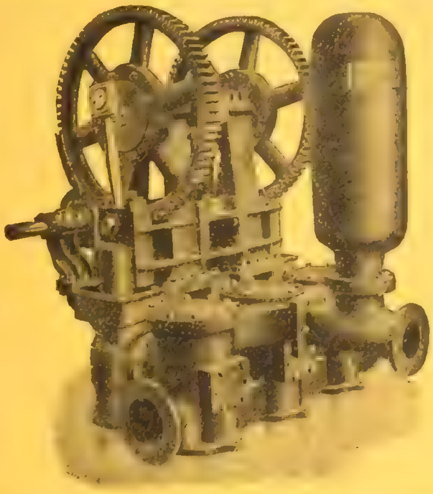
Vol. 25 Toronto, May 31, 1911 No. 22

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

We manufacture Steam and Power Pumps
Condensers, Travelling Cranes, etc.



The Smart-Turner Machine Company
HAMILTON, ONTARIO Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

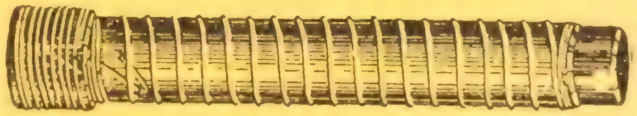
Belt Driven
Portable

CONTRACTORS

Air
Compressors

Page 28.

Canadian RAND Co., Ltd.
Commercial Union Bldg., Montreal, Can.



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS
for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

---

NOTE THE TONE OF THIS LETTER

"For the two 'AMERICAN' Engines which we have used for six years, we have paid very little for repairs. We have Engines of other makes on which the repair bills have been FOUR TIMES what we spent on the 'AMERICANS.'

We use these two engines for Pile Driving (the hardest work an engine is called upon to do), because we consider them better adapted to this kind of work than any other engine on the market.

The several 'AMERICAN' Derricks we have are the BEST WE HAVE EVER USED, and do not see how any one could make a mistake in buying 'AMERICAN' Derricks or Engines."

LANGHORNE & ALLEN, Oneonta, Ky.

THERE IS UNMISTAKABLE ENTHUSIASM AND SINCERITY IN THIS LETTER FROM CONTRACTORS WHO RANK HIGH IN THEIR PROFESSION

May we send you prices and information on "American" Machinery?

AMERICAN HOIST AND DERRICK CO.

ST. PAUL, U.S.A.

AUTHORIZED AGENTS—
Gorman, Clancey & Grindley, Edmonton and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot, Ltd., Vancouver, B.C.
J. L. Neilson & Co., 602, Main Street, Winnipeg, Man.
Dunn Brothers, Winnipeg, Man.
J. A. McTaggart, Winnipeg, Man.

It is perhaps not generally known

that we have an Information Department consisting of trained and practical men, whose time is employed solely in answering enquiries from people interested in cement.

Now it will be readily understood

that out of the mass of enquiries that come to us, there are a number that include questions as to what might be termed Allied Industries. These we now answer to the best of our ability, but we could answer them still more satisfactorily, if manufacturers of materials used in conjunction with cement would co-operate to the extent of sending copies of their catalogues and other literature to be placed on file in our office for reference.

We should like to obtain

the names and addresses, together with catalogues, and any other obtainable information of manufacturers of and dealers in:

1. Concrete Machinery	**4. Tile Molds**
2. Building Blocks	**5. Fence Posts**
3. Cement Bricks	**6. Re-inforcing Material**
7. Water-proofing Compounds	

It is not alone for our own convenience that we make this suggestion ; firms who manufacture or deal in such articles will find it to their own advantage to have this information in the hands of our Information Department, thereby enabling us to hand on to them from time to time enquiries for such materials as they severally make.

In sending catalogues, literature or information, please address same to "Sales Department."

The——

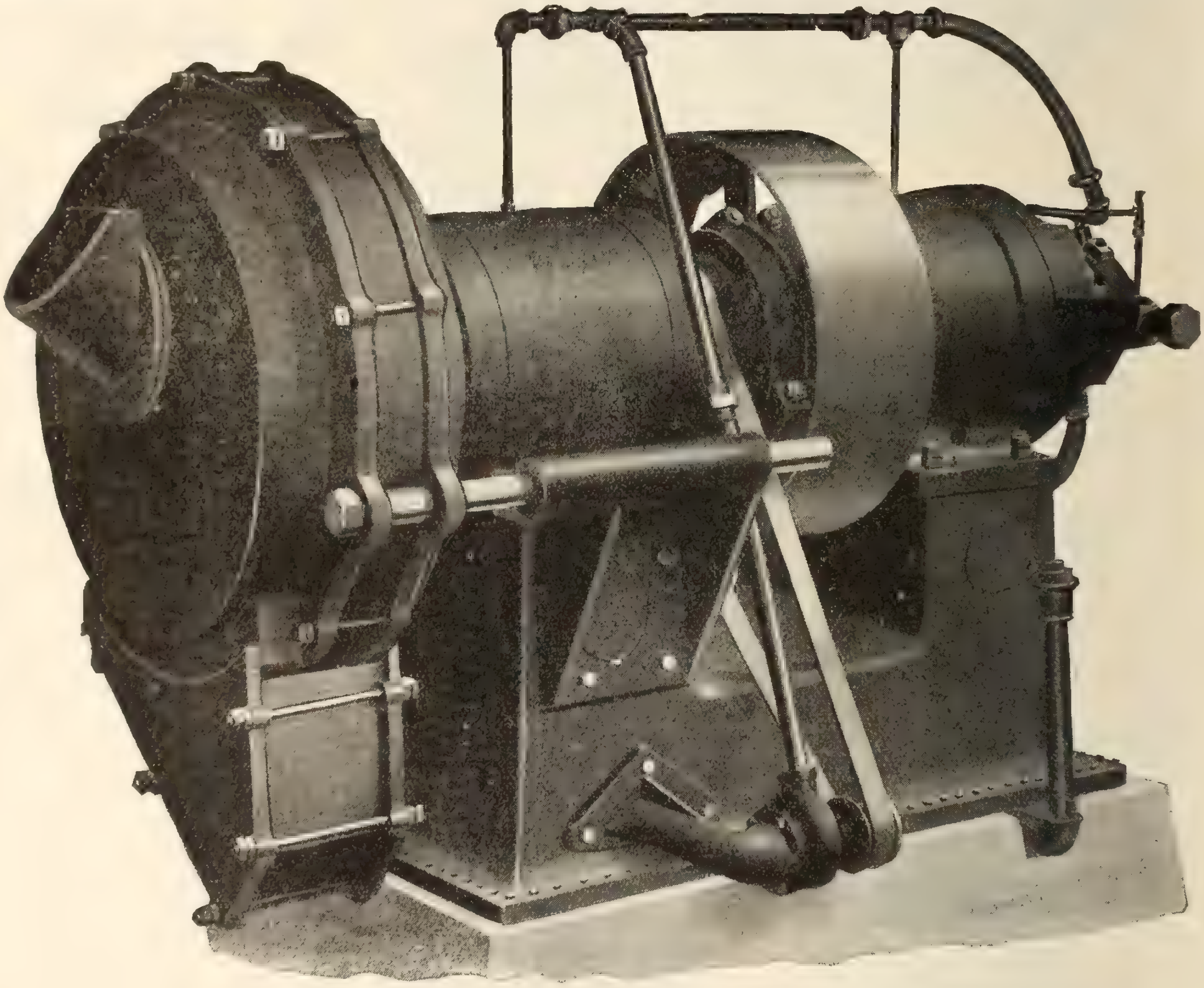
Canada Cement Company

Limited,

Banque National Building - - - MONTREAL

Symons
Disc Crushers

AN ENTIRELY NEW PRINCIPLE WHICH HAS MADE A SUCCESS.



SEND FOR LITERATURE AND PRICES

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

The Symons
isc Crusher

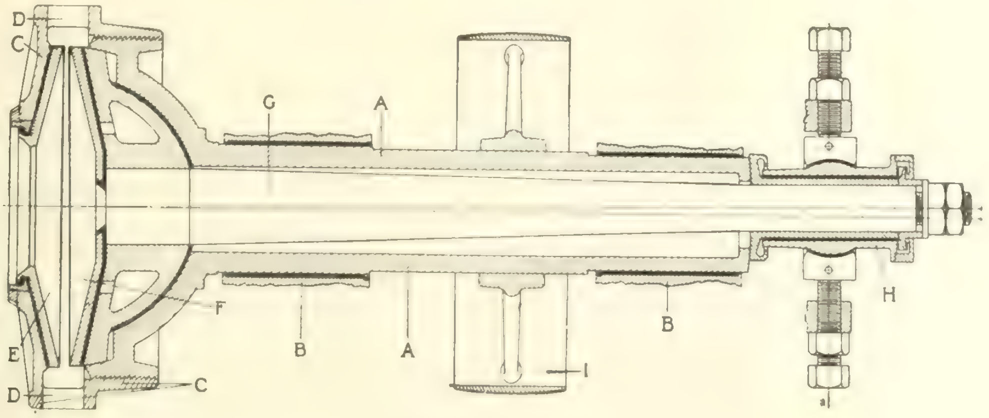
is the only crusher which will take rejections, screened or unscreened, from standard gyratory crushers and reduce same rapidly at one operation to ¾-inch size and less.

is the only crusher which successfuly reduces wet or dry gravel boulders mixed with sand, to smaller product.

is the only crusher which can be quickly adjusted to make any standard size of product desired between 3 inches and 5-16 inch.

is the only crusher which spreads the stone while crushing it from a central feed opening, thereby avoiding conjestion and choking.

rushing Discs



Sectional View

Size of Crusher	48-in.	36-in.	24-in.	18-in.	13-in.
Approx, Shipping wt.	30,000	19,000	8,500	5,600	3,000
Opening in Elliptical Feed Spout	11¼ x 17	9¼x14¼	7x10⅝	4¾ x 7	4 x 4¼
Opening between discs at feed Spout	8-in.	5-in.	3¼-in.	2¼-in.	1¼-in.
Min. exit opening for best results	1-in.	¾-in.	½-in.	⅜-in.	¼-in.
	Size of Ring = Tons per Hour	Size of Ring = Tons per Hour	Size of Ring = Tons per Hour	Size of Ring = Tons per Hour	Size of Ring = Tons per Hour
Cap. in tons per hour	1 = 45- 60	¾ = 25-30	½ = 12-15	¼ = 5- 8	¼ = 4-5
	1½ = 60- 75	1 = 30-40	¾ = 18-20	½ = 8-10	⅜ = 5-7
	2 = 75- 80	1½ = 40-50	1 = 20-25	¾ = 10-12	½ = 6-8
	2½ - 85- 100	2 = 50-60	1½ = 25-30	1 = 12-15	⅝ = 8-10
R.P.M. Main Pulley	100	133	150	200	300
R.P.M. Eccentric Pulley	200	266	400	450	600
Size of Pulleys	54 x 16	44x14	34x10	28 x 8	20 x 6
H.P. required	50 - 65	30 - 40	18 - 25	12 - 18	10 - 15

Note the
Enormous
Capacity
per day

o Tons of ¼-inch
TO
oo Tons of 2½-inch

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects

	Page
Keeler, Allan	88
Weeks, Arthur I	88

Architectural Iron Work

Canada Wire Goods Mfg. Co	70
Dennis Wire & Iron Works	77
Meadows Co., Geo. B.	33

Air Compressors

Escher Wyss & Co	67

Air Valves, Automatic

Marsh, J. P.	80

Asphalt Plant

East Iron Machine Co	73

Buckets

American Hoist & Derrick Co.	2
Sackett Screen & Shute Co	

Belting

Federal Engineering & Supplies, Ltd	72

Blowers

Sturtevant Co., B. F.	

Boilers

Case Threshing Machine Co.	79
Inglis, John	65
Jenckes Machine Co.	2
Leonard & Sons, E	73
Marsh & Henthorn	70
McDougall Caledonian Iron Works	67
Mussens Limited	4
Waterous Engine Works Co.	77

Brick Machinery and Supplies

Berg Mfg. Co.	
Peerless Brick Machine Co	27
Wett C. S.	
Whitehead, John	25

Brick

American Enamelled Brick Co.	
Don Valley Brick Works	7
Hamilton Pressed Brick Co	25
Milton Pressed Brick Co	
Port Credit Pressed Brick Co.	86
Toronto Pressed Brick Co.	

Brickmaker's Supplies

Sackett Screen & Shute Co	

Bridges (Steel)

Attica Bridge Co.	26
Canadian Bridge Co	84
Cleveland Bridge Co.	84
Dickson Bridge Works	
Dominion Bridge Co	84
Hunter Bridge and Boiler Works	30
Phoenix Bridge and Iron Works	85
Pennsylvania Steel Co.	84

Cement

Alsen Portland Cement Co	74
Britnell & Co	80
Bremner, Alex	87
Canada Cement Co	3
McNally & Co., W.	85
Morrison & Co., T. A.	88
Rogers, Alfred Limited	9

Concrete Pipe

Dominion Concrete Co.	22
Lock Joint Pipe Co.	

Cement Waterproofing

Ceresit Waterproofing Co.	33
Hercules Waterproofing Cement Co	29
Mansbendel, F. P.	31

Cranes, Travelling & Locomotive

	Page
American Hoist & Derrick Co.	2
Armstrong, H. J.	
Smith Marble & Construction Co.	
Brown Hoisting Machinery Co.	77
Males Co	62
Willis Shaw Machinery Co	62

Conduits

Conduits Co., Limited.	87

Crushed Stone and Granite

Sand and Supplies	85

Concrete Mixers and Machinery

Canada Foundry Co.	20
Cropp Concrete Machinery Co.	82
Famous Block Machine Co.	
Gould Shapley & Muir	16
Hopkins & Co., F. H	92
Jenckes Machine Co	2
London Concrete Machinery Co.	33
Milwaukee Mixer Co.	16
Mussens Limited	4
Morrison & Co., T. A	88
Vining Bros.	
Wettlaufer Bros.	10

Contractors' Plant

American Hoist & Derrick Co.	2
Acme Eqpt. & Engineering Co.	75
Beatty & Sons, M.	6
Hepburn, John T.	12
H. & E. Lifting Jack Co	76
Hopkins & Co., F. H	92
International Marine Signal Co.	8
Willis Shaw Machinery Co.	62
Meaford Wheelbarrow Co.	62
Marsh & Henthorn	70
Montreal Locomotive Works	32
Mussens Limited	4
Oshkosh Logging Tool Co.	26
Ritchie Contractors Supply Co.	72
Tiffin Wagon Co.	

Crushers (Stone and Rock)

Berg Machinery Co	
Case Threshing Machine Co.	79
Hopkins & Co., F. H.	92
Jenckes Machine Co	2
Males Co	62
Mussens Limited	4
Morrison & Co., T. A	88
Willis Shaw Machinery Co.	62

Corrugated Iron

Galt Art Metal Co	72
Metallic Roofing Co	71
Metal Shingle and Siding Co.	
Ormsby, A. B., Limited	11
Roofers Supply Co	87

Contractors

Bennett, Robt.	
Foundation Co	89
Holmes, Fred.	
McIlwraith, Jas. A	88
Nadel & Adler	88
Wells & Gray	91

Coal Handling Apparatus

American Hoist & Derrick Co.	2
Down Draft Furnace Co.	75

Derricks and Derrick Fittings

American Hoist & Derrick Co.	2

Drills

Beatty & Sons M	6
Canadian Rand Co	28

Drilling Contractors

Harvey, J.	8

Dredges

	Page
Beatty & Sons, M	6
Males Co.	62
Willis Shaw Machinery Co	62

Dry Kilns

Sturtevant Co., B. F.	

Electrical Apparatus, Motors

Canada Ford Co.	

Engines

Case Threshing Machine Co.	79
Canadian Boving Co.	
Inglis, John	65
Jenckes Machine Co.	2
Leonard & Sons, E	73
Mussens Limited	4
Sturtevant Co., B. F.	
Waterous Engine Works Co.	77

Engineers (Civil) and Mechanical

Barber & Young	88
Chipman & Power	88
Bowman & Connor	88
Farmer, John T.	88
Fuce, Edw. O.	88
Galt Engineering Co., John	88
Glaubitz, H. J.	88
Hancock, H. Syd.	88
Inglis, John	65
Kennedy, Jas. C.	88
Lea & Ferguson	88
Mace, T. Harry	88
Mitchell, C. H.	88
McRae, John B.	88
Moore & Scollan	88
Taylor, James	88

Exhaust Heads

Sturtevant Co., B. F.	

Filters

American Water Softener Co.	

Floor Scrapers

Hurley Machine Co.	30

Friction Clutches

Berg Machinery Co.	

Field Instruments

Gurley, W. & L. E.	70

Fire Brick

Gibb, Alexander	81

Fire Apparatus

Morrison & Co T. A.	88
Seagrave, W E.	80

Fireproof Doors and Windows

Douglas Bros	18
Mussens Limited	4
Ormsby, A. B.	11

Gauges, Steam, etc.

Marsh, Jas. P.	80

Granite and Marble

Laurentian Granite Co.	83
Missisquoi Marble Co.	81
Smith Marble & Construction Co.	

Glass

	Page
Chance Brothers & Co.	18
Consolidated Plate Glass Co.	
Luxfer Prism Co.	
Thompson & Co., B. & S. H.	18
Toronto Plate Glass Importing Co.	

Heating Apparatus

Jenckes Machine Co.	2
Leonard & Sons, E.	73

Hoisting Machinery

American Hoist & Derrick Co.	2
Beatty & Sons, M.	6
Canada Ford Co.	
Inglis, John	65
Jenckes Machine Co.	2
Hopkins & Co., F. H.	92
London Gas Power Co.	73
Marsh & Henthorn	70
Mussens Limited	4
Sturtevant Co., B F.	

High Pressure Pipe Lines

Escher Wyss & Co.	67

Hydrants

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co.	86
Kerr Engine Co.	

Interior Finish and Doors

Anglin, S.	74
Batts Limited	
Canada Office & School Furniture Co	
DeLaplante, Ltd.	81
Bryan Mfg. Co.	71
Eaton & Sons, J. R.	81
Georgian Bay Shook Mills	91
Rhodes Curry & Co.	
Tillson Co.	19
Wilson Bros.	

Lime

Christie, Henderson & Co.	80
Jamieson Lime Co.	27
Standard White Lime Co	75

Metal Lath

Galt Art Metal	
Metallic Roofing Co.	71
Noble C. W.	74

Meters

Hopkins & Co., F. H.	92
McDougall Caledonian Iron Works	67
Neptune Meter Co.	71

Paving and Paving Materials

Dominion Carbolineum Works	
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	74
Shawmut Paving Brick Co.	
Silica Barytic Stone Co. of Ontario	89

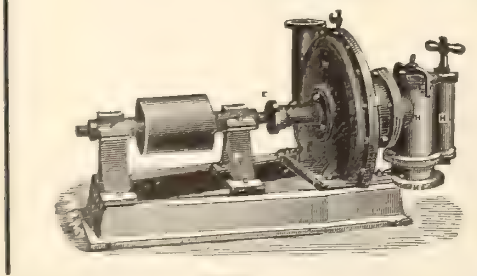
(Continued on page 10)

M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

SIMPLE PERFECT

CLEAN WATER

For MANUFACTURERS or MUNICIPALITIES

Can be obtained by using the

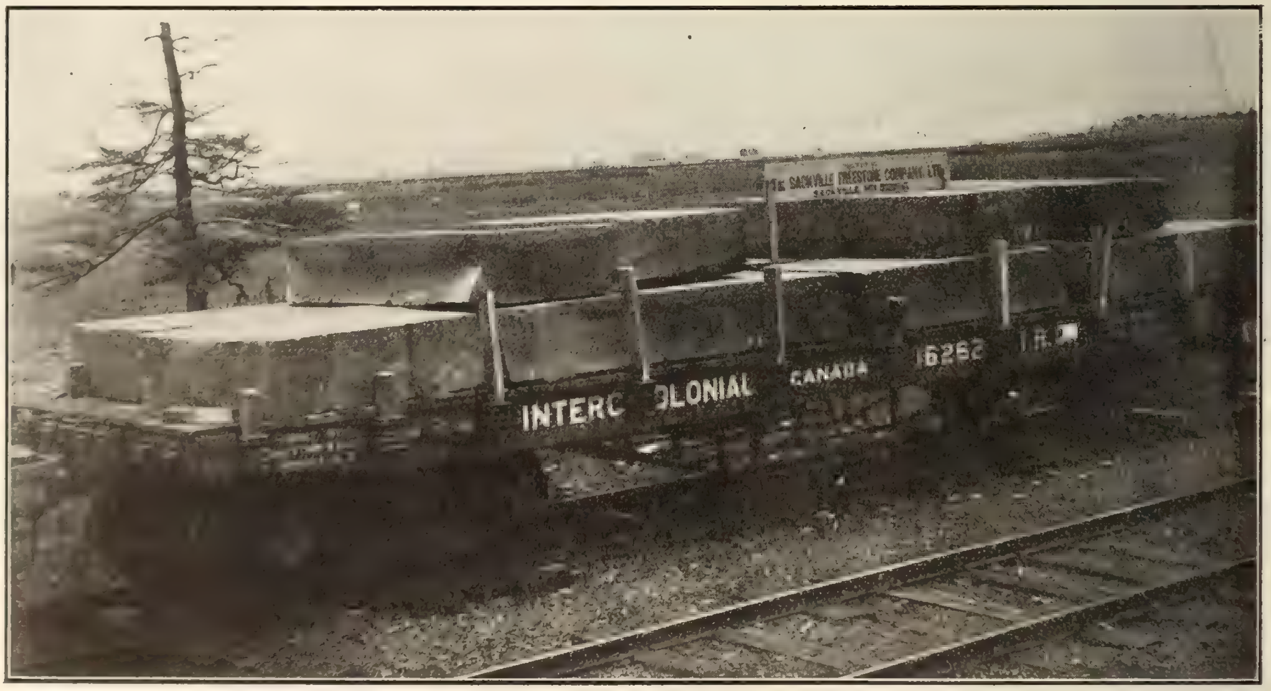
"TORRENT" or "PULSOMETER"

FILTER

Complete information furnished on request

International Marine Signal Company Limited
OTTAWA, CANADA

GRAVITY PRESSURE



Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster Page
Albert Mfg. Co. 30
[illegible] & Co 80
[illegible], H. W 80

Pipe
American Spiral Pipe Works 75
Canadian Pipe Co 80
Dominion Wood Pipe Co. 13
Dominion Concrete Co 22
Gartshore Thomson Pipe Co. 80
Lock Joint Pipe Co.
[illegible] & Co 11
National Iron Works 87
Pacific Coast Pipe Co. 1
Pedlar People

Plumbers' Supplies
Standard Ideal Co. 31

Power Engines
Inglis Co., John 65

Paints and Varnishes
Paterson Mfg. Co. 90

Pile Driving Machinery
American Hoist & Derrick Co. 2
Lincoln Construction Co. 82

Pumps and Pumping Machinery
American Well Works
Beatty & Sons, M 6
Escher Wyss & Co. 67
Hopkins & Co., F. H. 92
Inglis Co, John 65
Leonard & Sons, E 73
McDougall Caledonian Iron Works 67
Mussens Limited 4
Ontario Wind Engine & Pump Co. 82
Smart-Turner Machine Co. 1
Waterous Engine Works Co 77

Roofing Contractors
Schwoerer & Sons, A.

Roofing Materials Page
Asbestos Mfg Co. 24
Galt Art Metal Co.
Metallic Roofing Co. 71
Metal Shingle & Siding Co.
Noble, Clarence W 74
Paterson Mfg. Co. 90
Philip Carey Co
Roofers Supply Co. 87
Standard Paint Co.

Railway Supplies
Gartshore, John J. 83
Hopkins & Co., F. H. 92
Mussens Limited 4

Reinforcements, Concrete and Steel
Anderson Hydraulic Construct'n Co. 83
Canada Wire Goods Mfg. Co. 70
Concrete Form Engine Co. 71
Steel Co. of Canada 19
Steel & Radiation 90
Trussed Concrete Steel Co. 68
Turner, C. A. P.

Road Machinery
Case Threshing Machine Co. 79
Hamilton Machinery Co. 15
Morrison & Co., T. A 88
Mussens Limited 4
Western Wheeled Scraper Co. 11

Shovels (Steam)
Beatty & Sons, M. 6
Canada Foundry Co. 20
Hopkins & Co., F. H. 92
Mussens Limited 4
Males Co 62
Willis Shaw Machinery Co. 62

Stone
Anderson, Geo 18
Britnell & Co. 80
Brodie, Jas.
Christie, Henderson & Co. 80
Consolidated Stone Co.
Contractors' Supply Co. 80
Corinthian Stone Co. 23
Crushed Stone, Limited 73
Doolittle & Wilcox 70
Hagersville Contracting Co. 11
Laurentian Granite Co. 83
McMillan & Son, R.
Morrison & Co., T. A. 88

Stone Page
Myers, Oakley 73
Roman Stone Co 13
Sackville Freestone Co. 8
Sand & Supplies 85
Thames Quarry Co. 82

Sand and Gravel
Rogers Supply Co. 31
Sand & Supplies 85

Steam Apparatus
Sturtevant Co., B. F.

Submarine Diver
Rouleau, Joseph N. 83

Structural Iron and Steel
Buffalo Steel Co. 76
Dominion Bridge Co. 84
Steel Co. of Canada 19
Pennsylvania Steel Co. 84
Phoenix Bridge & Iron Works 85
Reid & Brown 83
Salter, W. H. 85
Steel & Radiation 78

Sewer Pipe
Britnell & Co 80
Canada Iron Corporation 86
Dominion Sewer Pipe Co. 21
GartshoreThomson Pipe Co. 86
Hamilton & Toronto Sewer Pipe Co. 20
Lock Joint Pipe Co.
National Iron Works 87
Ontario Sewer Pipe Co. 21
Standard Drain Pipe Co. 21

Stationary and Power Engines
Case Threshing Machine Co 79

Slate
Roofers Supply Co. 87

Steel Shingles and Ceilings
Galt Art Metal Co.

Smoke Stacks
Leonard & Son, E. 73

Tents
Woods Limited 79

Safes and Vaults
Taylor, J & J

Page
Testing and Inspection Bureau
Hunt & Co., Robt. W 73

Tiles
Smith Marble & Construction Co.,

Tanks and Stand Pipes
Berg Machinery Co
Inglis, John 65
Jenckes Machine Co 2
Leonard & Sons, E. 73
Marsh & Henthorn 70
McDougall Caledonian Iron Works 67
Ontario Wind Engine & Pump Co. 82

Trade Journals
Castellanos A. W. 82

Valves
Canada Iron Corporation 87
Gartshore-Thomson Pipe Co 86
Kerr Engine Co.
Marsh & Co. Jas 80
Standard Fitting & Valve Co 80

Ventilating and Heating Apparatus
Gardiner & Gaskill 77
Sturtevant Co., B. F.

Water Softeners and Filters
Berg Machinery Co.
American Water Softener

Wire Rope
Greening Wire Co., B.
Smith, Thos. & Wm 14
Steel Co. of Canada 23

Wire Guards and Screens
Canada Wire Goods Mfg. Co. 70
Crescent Wire Iron Works.
Sackett Screen & Shute Co

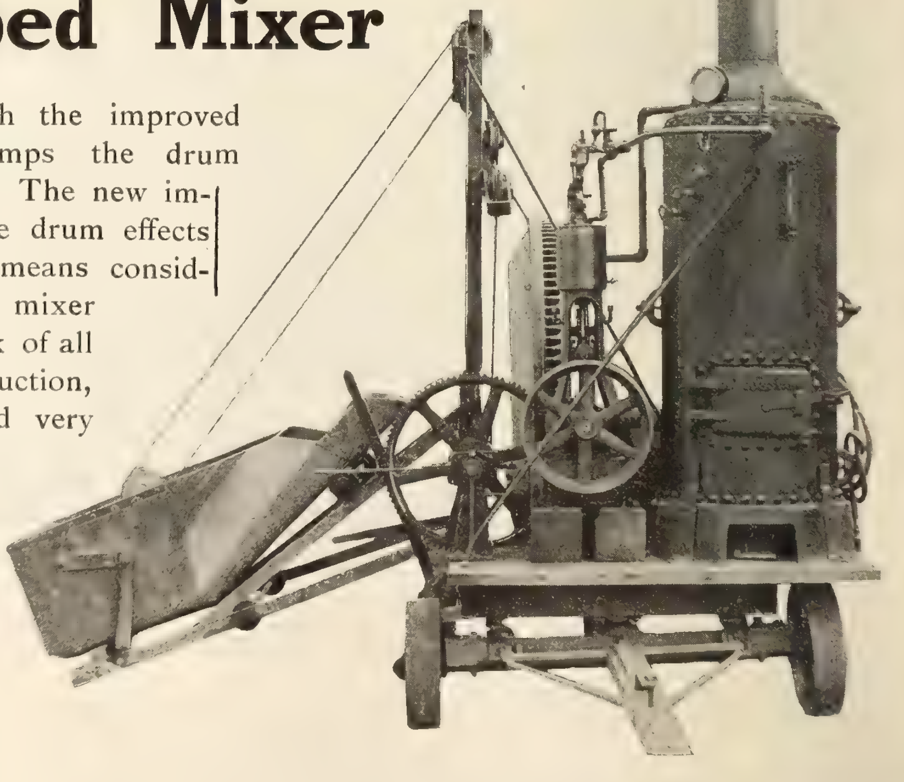
Water Wheels
McDougall Caledonian Iron Works 67
Canadian Boving Co.

Water Turbines
Escher Wyss & Co. 67

Wheelbarrows
Sackett Screen & Shute Co.

Improved Half-Yard Heart-Shaped Mixer

This Mixer is equipped with the improved dumping device which dumps the drum automatically or as required. The new improvement for discharging the drum effects a saving of one man, which means considerable on a contract. This mixer is especially built for roadwork of all kinds, sidewalk and construction, being substantially built and very compact.



Send for our Catalogue

Wettlaufer Bros.
178 Spadina Ave., TORONTO
A. R. Williams Machinery Company,
15 Dock St., St. John, N. B.
W. E. Ransome, Moose Jaw, Sask.

MODERN.

→ ESTABLISHED 1861. ←

MUNDERLOH & CO. LD.

Sole Agents in CANADA
for
MANNESMANN
SEAMLESS
STEEL
PIPES

FOR
GAS &
WATER MAINS

AN IMPROVEMENT
ON CAST IRON MAINS.

51 VICTORIA SQUARE,
MONTREAL.

MADE
UP TO
40 FEET
IN LENGTH.

STRONGER.

CHEAPER.

RELIABLE

THE
Proved Quality Dump Car

The unequaled **practical** experience back of Western Dump Cars combined with their **sturdy** construction and the fact that they have always led in improvement is the reason for their matchless reputation for **quality** and **efficiency**—they are as good as greatest skill can make them.

The Western Four Yard Car

is ideal size for 3-ft. gauge. It is unbeatable in design and construction—ample capacity for heavy loads, yet of low, compact form, with bed and truck separable, steep dumping angle and automatic pivoted side boards. It is dependable in **any** service.

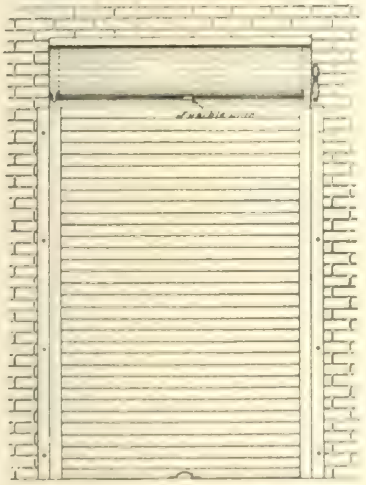
Sizes and styles of Dump Cars for every purpose are described in our general catalog of earth and stone-handling machinery.

Western Wheeled Scraper Co.

Earth and Stone Handling Machinery Aurora, Ill.

The Most Economical Door Made as Regards Space

Our Rolling Steel Doors take up but one foot above the opening and 2½ inches on either side. They have **proved themselves in actual fires** in Canadian Cities. Can be left in any position and will close of themselves when struck by fire. They stand any amount of wear and tear and are very easily operated. Specify our Patented Rolling Steel Door for any opening where a Fireproof Door is needed and space is limited.



Experts in Fireproof Windows and Doors

A. B. Ormsby, Limited

Factories { Corner Queen & George Streets - TORONTO
677-81 Notre Dame Avenue W., WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

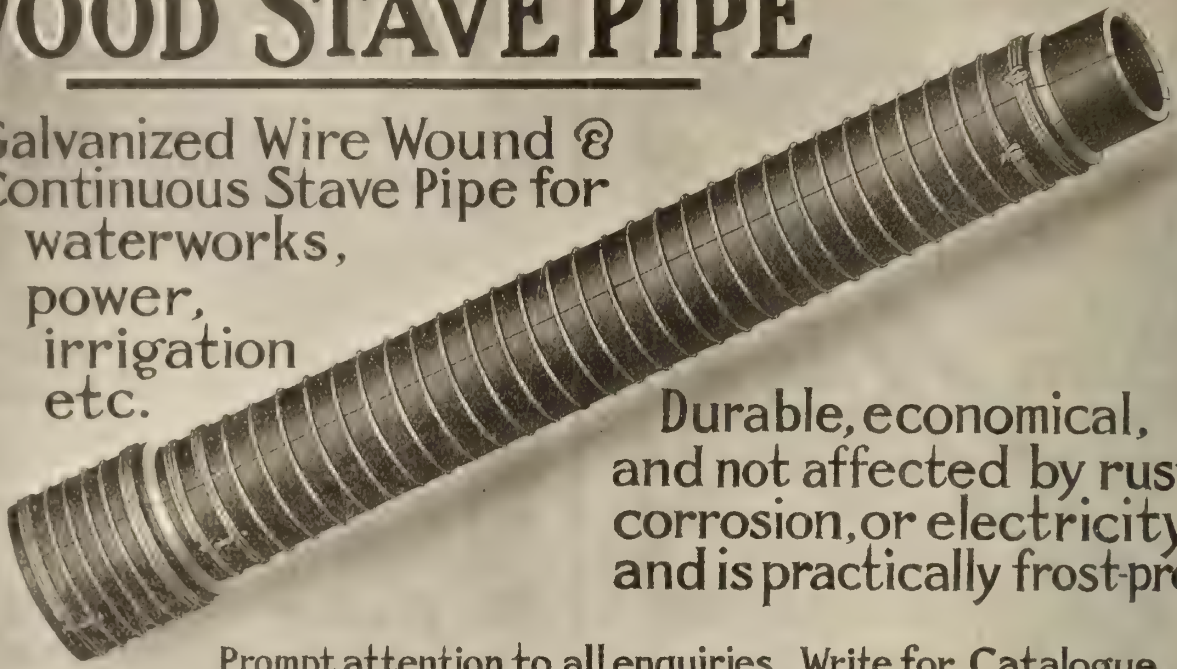
The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R.
and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.



WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Have you any use for a Derrick?

There are large plans under way. Large contracts are being placed. In all directions there is bustle and activity. Everything points to an unusually busy season for construction work of all kinds. But what about equipment?

John T. Hepburn

Scotch Derricks

are in use by all leading contractors in all parts of the country. They are designed and built for hard work, combining safety and high efficiency, with low operating cost. Being made in standard sizes, any part can be replaced at short notice. They may be operated by hand or power—are fitted with single and double purchase gears—powerful band brake—and safety locking device that prevents boom from falling.

We are busy now. We shall be busier in two or three weeks
Better place your order to-day to secure early delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company
Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

THOS. & WM. SMITH, LD.,

WIRE ROPE MANUFACTURERS,

NEWCASTLE-ON-TYNE, ENGLAND.

ELECTRIC CABLEWAY OVER THE ZAMBESI RIVER AT THE VICTORIA FALLS.
Span, 870 feet. Working Load, 10 tons. Main Cable 8½″ circ. Breaking Stress of Main Cable, 275 tons.
Main Cable supplied by THOS. & WM. SMITH LTD., Newcastle-on-Tyne.

HIGH-CLASS WIRE ROPES

For CONTRACTORS' WORK, such as BLONDINS, CRANES, INCLINES, BALLAST ROPES, &c., &c., and all classes of work requiring Wire Ropes.

AGENTS IN CANADA:

EVANS, COLEMAN & EVANS, Ltd., Vancouver.
ANGEL ENGINEERING & SUPPLY CO. Ltd., St. John's, N.F.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg.
BAINES & PECKOVER, Toronto.

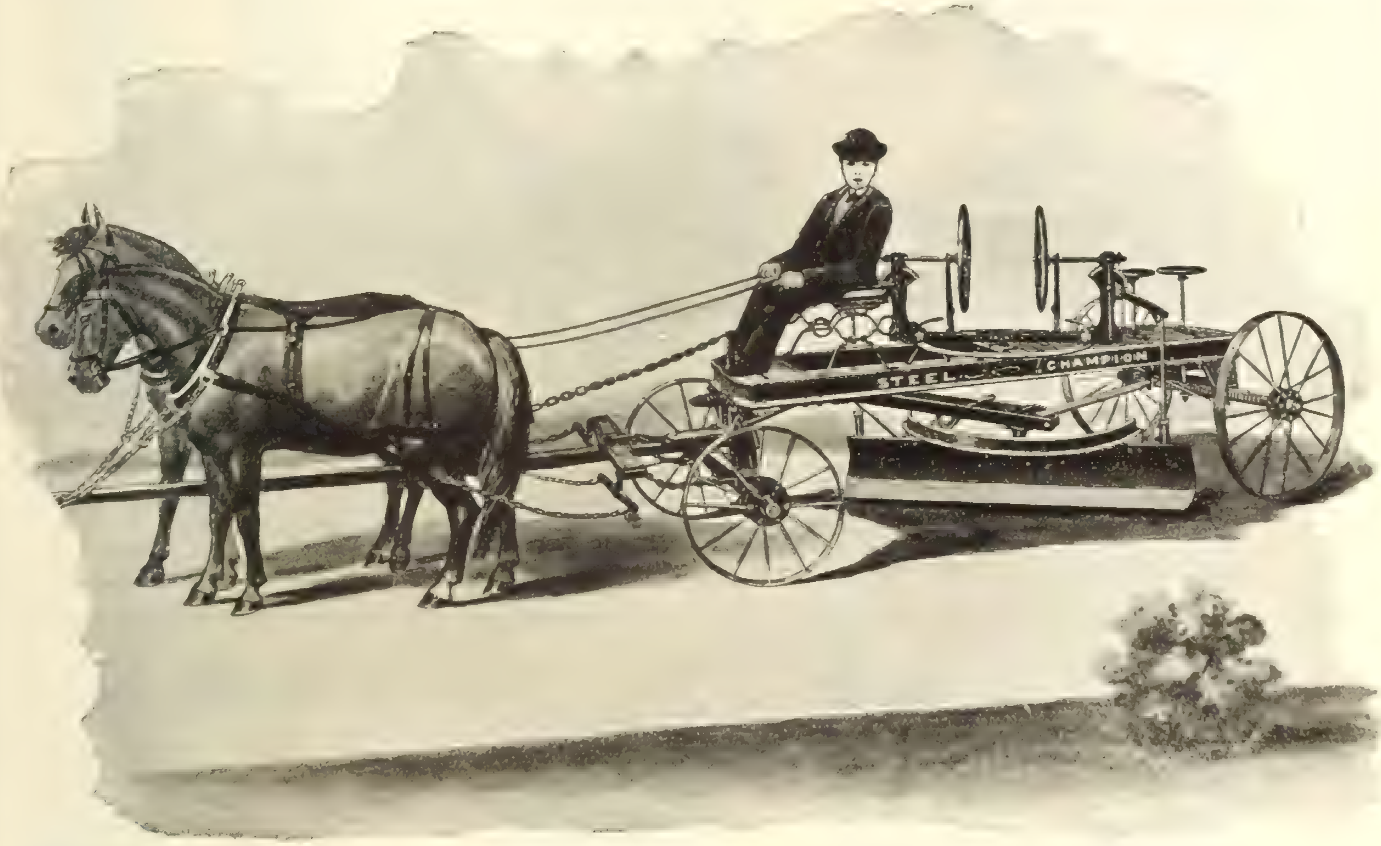
REPRESENTATIVE FOR CANADA:

D. W. CLARK, P.O. Box 521 TORONTO, ONTARIO.

USE ONLY SMITH'S "RED THREAD" WIRE ROPES.

"CHAMPION"

Steel Road Graders



NO GRADER that has appeared on the market for years has commanded such success as the "Champion." Its light draft, easy operation, extreme simplicity and thorough efficiency have brought it to the front everywhere. The "Champion" has construction exclusively its own—its superiority needs no argument to those who examine it.

Two Other "Champion" Successes:

"CHAMPION" SPRINKLERS **"CHAMPION" ROAD PLOWS**

EACH IN ITS FIELD has become an unquestioned leader. Do not place your order until you have seen them. Our catalog gives complete discription of their advantages and a copy will be sent for the asking. Write us to-day for literature and prices.

"Standard in Canada for 20 Years"

The American Road Machine Company of Canada, Limited, Goderich, Ont.

ADDRESS CORRESPONDENCE TO

The Hamilton Machinery Company, Ltd.

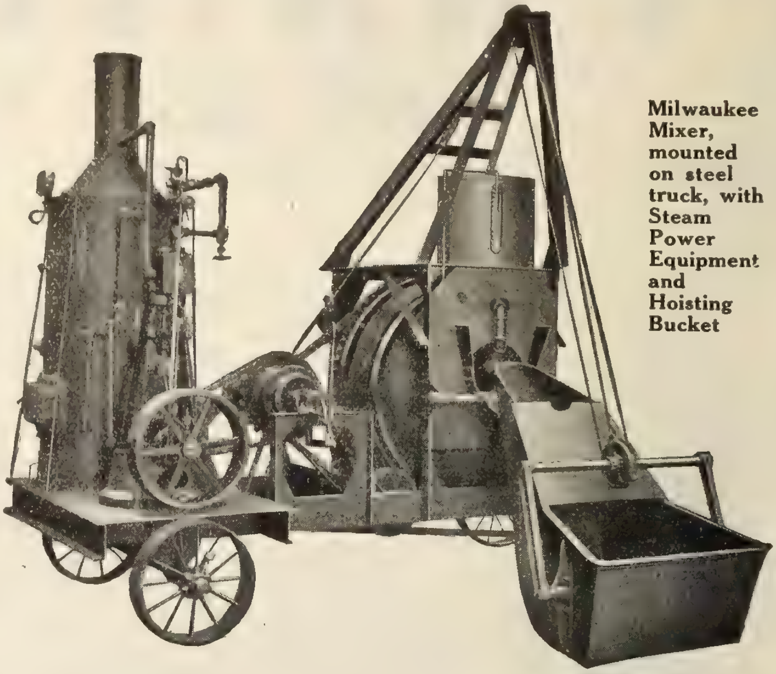
Hamilton, Ont.

Sole Agents for the above Company.

Also Agents for the famous Inter-State Automobile

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

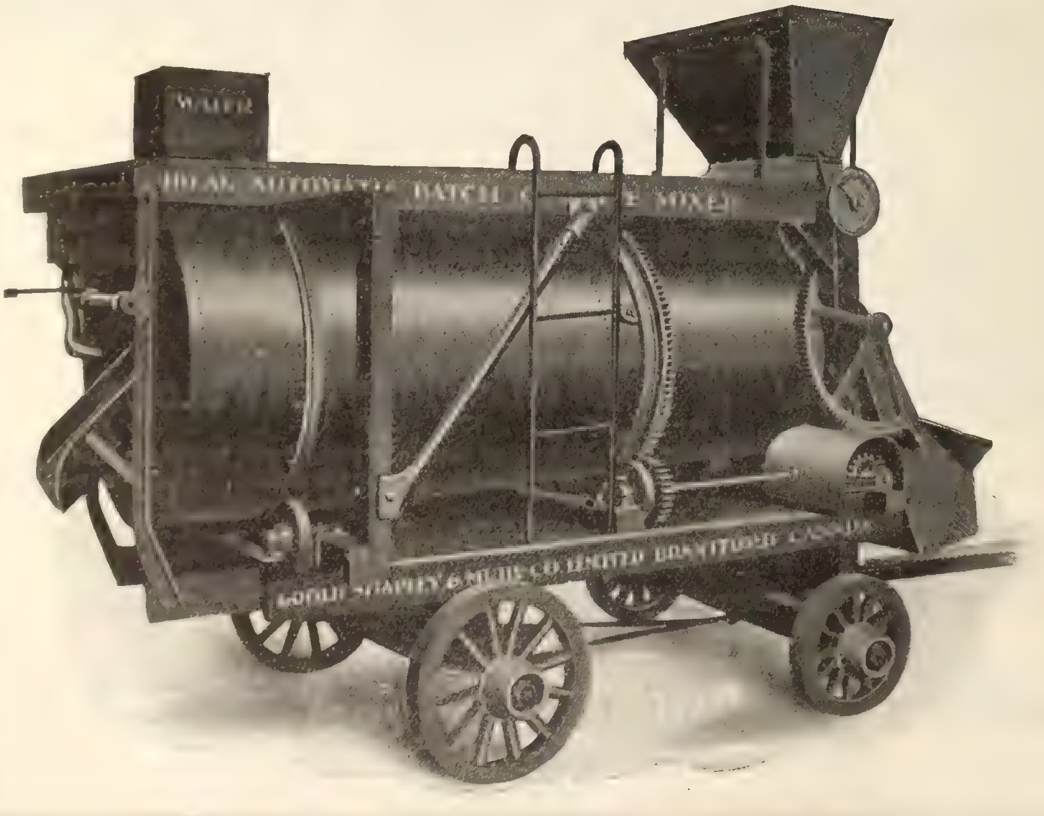
MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES:

The Stewart Machinery Co., Winnipeg, Man. **C. W. Stancliffe & Co., Vancouver, B. C.**
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS


WATER
IDEAL AUTOMATIC BATCH CONCRETE MIXER
GOOLD SHAPLEY & MUIR CO LIMITED BRANTFORD CANADA

Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

Tanks and Towers

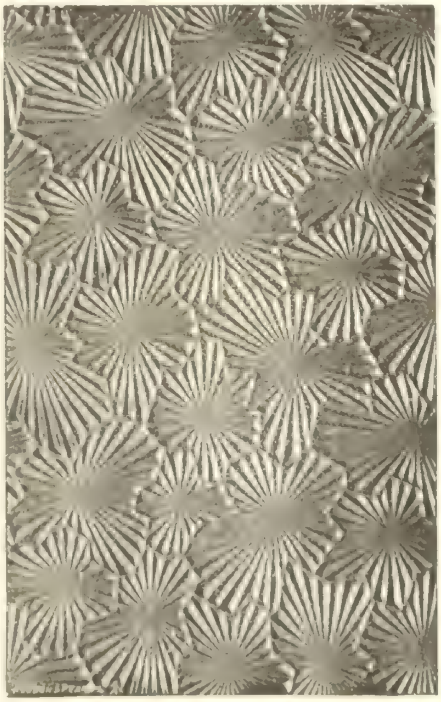
for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY
& MUIR CO. LTD.
Brantford, Canada

Chance's
Double Rolled Cathedral Glass

is brighter and more translucent than the ordinary Rolled Cathedral Glass. It cuts true and easily, and works up handsomely into leaded windows. Made in a very large variety of tints.



Chance's Figured Rolled
Muranese (small) Pattern

Chance's Figured Rolled Glass is famous for its deep, brilliant patterns, easy cutting qualities and attractive tints. The popular "Muranese" pattern illustrated here is made in three sizes, of which this shows the smallest.

"Flemish" Glass, made only in the glass works of Chance Bros. & Co., near Birmingham England, is a new and most attractive Ornamental Window Glass, unsurpassed for character and brilliancy.

Write for samples of Chance's Figured Rolled, Muffled, Double Rolled Cathedral and Flemish Glass.

Agents for Canada

B. & S. H. Thompson Co., Limited

381 St. Paul St. - - Montreal

Circular Diamond Saws

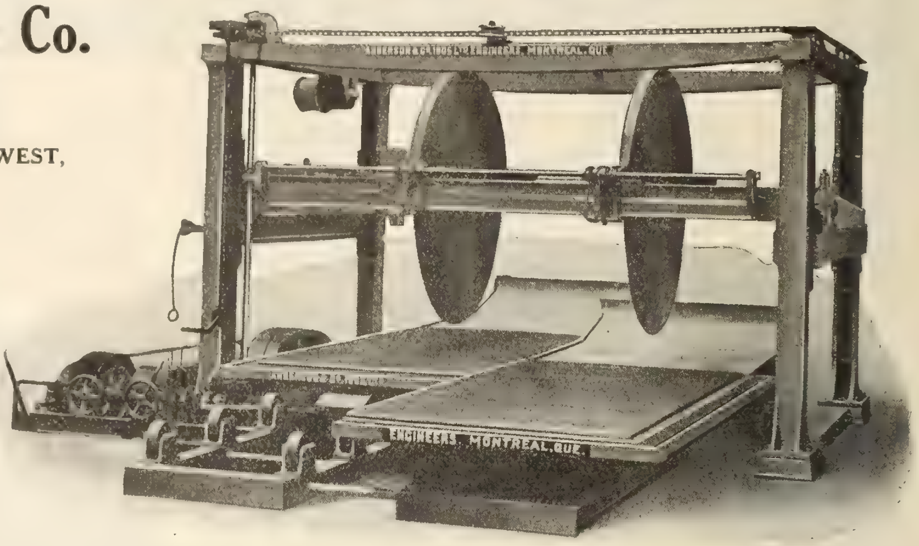
For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICES & WORKS
London, England, 82 Victoria St., S.W.
Newark, N.J., U.S.A. 420-422 Ogden St.
Montreal Works, 157 Craig St. West
Head Works, Carnoustie, Scotland

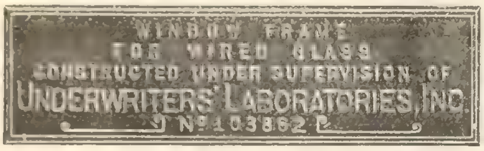
MAKERS OF

Gangs, Planers, Marble Dressers, Derricks, and Electric Traveling Cranes up to 50 tons, Quarry Machinery, Gas Engines and Producer Plants.
10 H. P. to 150 H. P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 SINGLE AND DOUBLE TABLES

About 50 of the above Machines at work in Canada


WINDOW FRAME
FOR WIRED GLASS
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES, INC.
No 103862

Underwriters' Label.

The Underwriter's Test

There is absolutely no question as to the comparative value of our Metal Fireproof Windows over the old-fashioned metal or metal-covered wood shutters. Repeated tests have proved conclusively the superiority of metal fireproof windows.

The ideal fireproof windows should be constructed to meet the following requirements:

It must be absolutely fireproof.

It must have hollow sheet metal frames and sash, fitted with wire glass.

It must be riveted and locked together so that it will not fall apart when exposed to intense heat, solder only being used to finish the seams and mitres.

The Douglas Window has stood the National Board of Fire Underwriters' test to which it has been subjected at their Laboratory at Chicago, and is endorsed by them.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

The
Tillson Company
Limited
WHOLESALE MANUFACTURERS OF

Sash, Doors, Mouldings, Frames for Doors and Windows, Columns, Interior Finish of Every Description, Porch Work, Gable Ornaments, Brackets, Head Blocks, Corner Blocks, Base Blocks, Door and Window Screens, Etc.

Millwork of all kinds

Tillsonburg,
Ontario

The Steel Company of Canada Limited
Hamilton - Toronto - Montreal

PLAIN ROUNDS, & SQUARES, COLD TWISTED SQUARES

MAXWELL DEFORMED BAR

STEEL BARS
for Reinforcing Concrete

J. H. NEW, President

RYLAND H. NEW, Vice-President

KNOWN FROM COAST TO COAST

Established Half a Century

The constant, steady growth in sales of

Hamilton Vitrified Salt Glazed Sewer Pipe

to the corporations all over Canada conveys to us the knowledge that our product has met every requirement of the most exacting users of this class of material.

In addition to the quality of our goods we have a word to add in regards to our attention to orders. We claim to take care of your orders more promptly than anyone else in the business. We can prove this claim if you will only give us the opportunity.

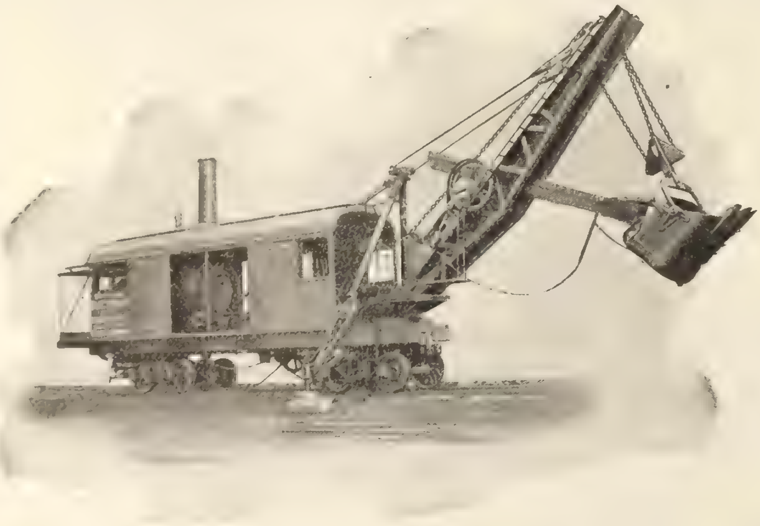
The Hamilton & Toronto Sewer Pipe Co.

Limited

HAMILTON and TORONTO

Long Distance Phones:—Toronto, Main 990, College 1558. Hamilton, 3990, 3991, 3432.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert **Pipes**

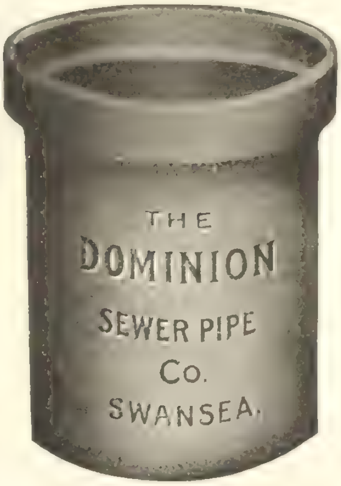
We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) **Limited**
SWANSEA (near Toronto)

Large Contracts are our Specialty

The Pipe that makes
THE SEWER SURE

WE carry a stock in all sizes, 4 inch to 24 inch, large enough to keep any job going regardless of the press of business in one-car orders.

That means money to you

No waiting on pipe when you place your orders for **"MIMICO"** goods, and it is also good right when it arrives.

It Saves You Worry
Worry Shortens Life

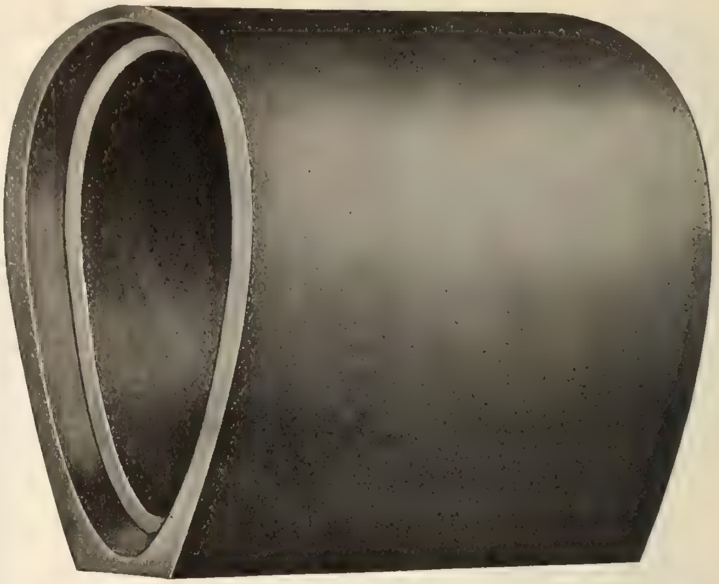
ROUND Pipe and SQUARE Dealings

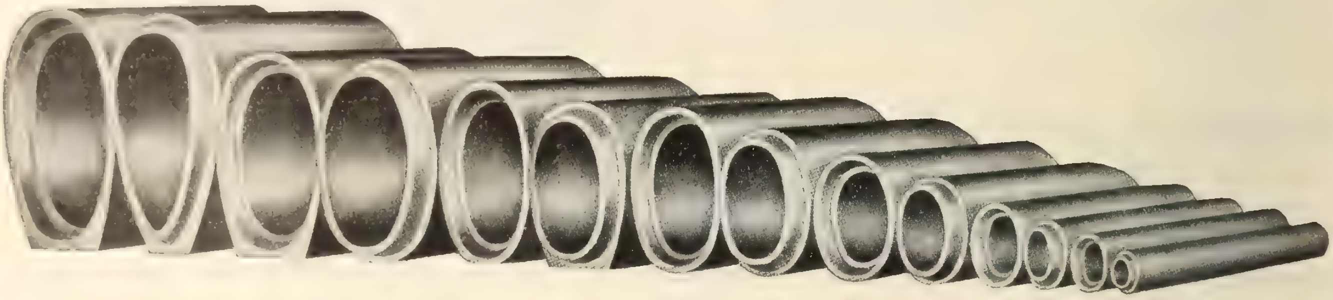
The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422, Evenings Park 3888 and 3889

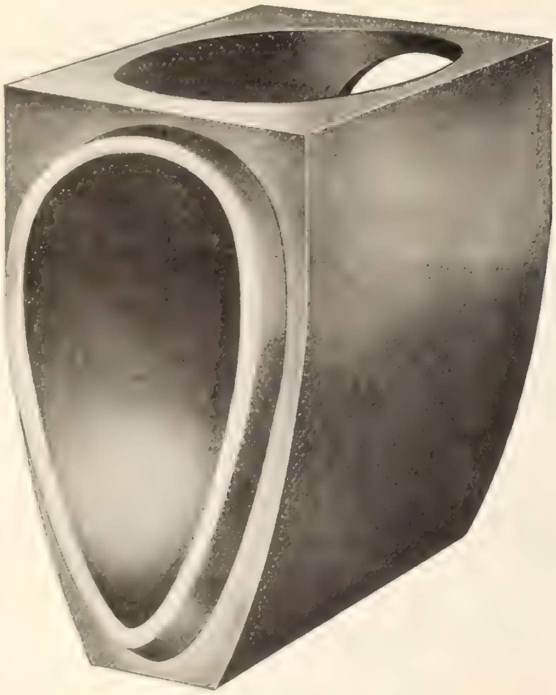
Municipal Engineers and Contractors

For **sewers** the only everlasting pipe is **concrete.** Builders do not use brick in foundations. Why? Because of the moisture. They do use concrete. Why? Because it is a proof against the destructive tendency of moisture. Why continue to use brick for sewers when a better material is now available at as low a cost?

In **Duluth** brick sewers failed after seven years so as to require replacement. **Concrete** sewers put in at the same time are **intact.** In **Millwaukee** after 25 years concrete pipe was found better than when new. Of 300 miles of sewers in **Millwaukee** over 200 miles are of **concrete**.


Section of 2' x 3' pipe




Man-hole Section of 2' x 3' pipe

Concrete sewers abound in **England** and **Germany**. The modern **sewers** of **Paris** are all of **concrete**. American cities have adopted it. **Brooklyn** has hundreds of miles of it with not a single failure, whereas even Scotch vitrified pipe has been found to have deplorably failed there. **Toronto,** after much hesitation, is now in line with concrete. Why be the last to join the ranks you eventually will and must join ?

Our circular and egg-shapped sewer pipe are unsurpassed in quality, are more easily laid than flanged pipe, and give no trouble or ridiculous expense over man-holes or connections.

We have replaced vitrified pipe with concrete pipe and have found over 50 per cent of the vitrified unfit for re-laying. We carry a large and mature stock, we guarantee the quality, we take care of breakage in transit, and we solicit your patronage.

WRITE FOR CATALOGUE PRICE

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO

Corinthian Stone

is being largely used for Public Library Buildings, a larger ornamentation being possible at a small price. Corinthian Stone is acknowledged to be the best artificial stone, has tested over 4,000 lbs. crushing strength to square inch. Any size, shape or quantity can be supplied. :: :: :: ::

Carnegie Public Library, Ingersoll—Architect, Thomas Nagle, Esq., Ingersoll.

WRITE FOR PRICES

All the stone for this building was supplied by

The Corinthian Stone Co.

OFFICE AND WORK:
G. T. R. JUNCTION, GUELPH, ONTARIO

The Only Everlasting Roof

Asbestos Cement Slate

"This is practically indestructible by atmospheric influences, so that maintenance expenses for roofs covered with this material are excluded.

For a period of three months the asbestos cement slate absorbs, and assimilates moisture in exactly the same ratio as the best natural slate. After that time the absorption ceases altogether, and the material becomes impervious, indestructable, and as hard as iron.

The stringy asbestos fibres, which, by characteristic peculiarity of a patented process, are embedded cross-wise in the cement paste. This has exactly the same effect as concrete-steel constructions. They impart to the asbestos slate extremely high physical strength, indifference to blow or shock, and great elasticity. These properties are of the same importance to conveyance, and the laying of the asbestos slates, as they are to their durability and length of service.

The insulating capability of asbestos when brought to bear either upon heat or cold, imparts an increased importance to asbestos cement slate, not only in its suitability for the tropics—where it is commonly used as a substitute for corrugated iron; but also for the continental climate, where it is economically used in workshops, in dwelling rooms, and particularly over garrets, which, with other roof coverings, would have to remain unoccupied.

The fireproof quality of asbestos renders asbestos cement slate a thoroughly fireproof material, which, owing to its strictly scientific manufacture, cannot become either cracked, rent, or scaled in case of fire."

The above is an extract, word for word, from a government report of the Canada Department of Mines.

We are the only manufacturers of asbestos shingles or slates in the Dominion of Canada."

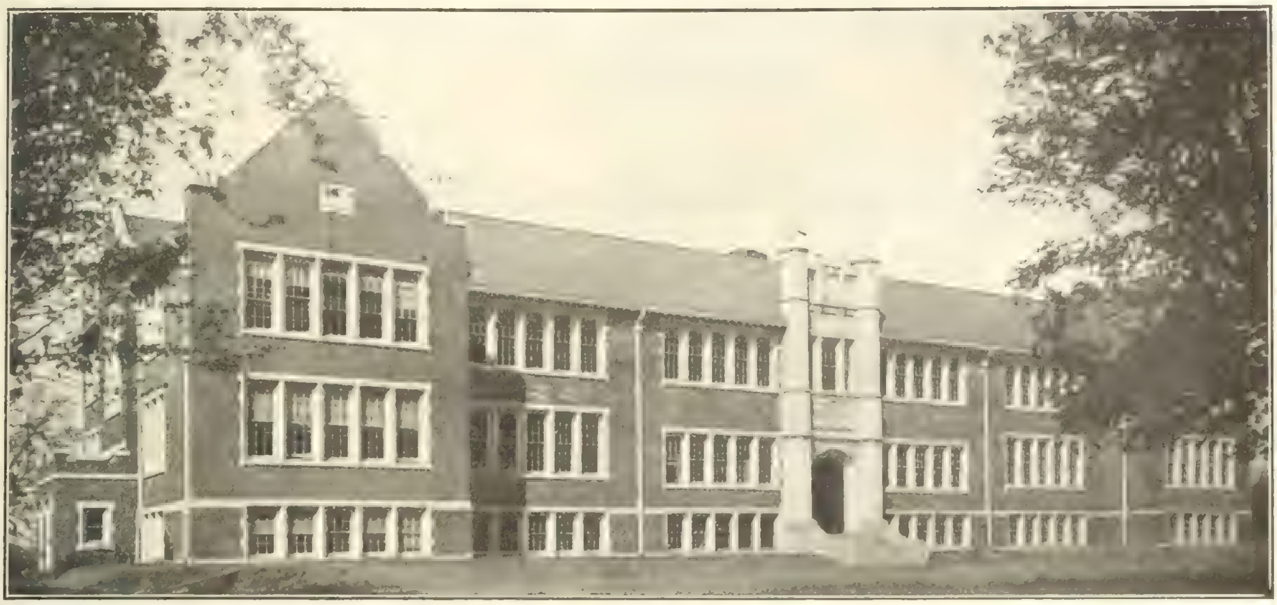
Specify

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P. Q.
Factory at Lachine, P. Q.

Hamilton Pressed Brick



New Collegiate Institute, Brantford, Ont. Chapman & McGiffen, Architects, Toronto

For Clean Brick-Work

This brick is free from so-called soda. After twenty years it will look as clean and fresh as the day it is delivered. Hamilton Pressed Bricks are uniform in size and color. The illustration shows a neat, clean cut job obtained with our brick. Specify **more** than "Brick" make it **"Hamilton Pressed Brick."**

Besides furnishing a high class product we can fill your orders promptly. Connections with T. H. & B, C. P. R., G. T. R. M. C. R.

Hamilton Pressed Brick Company

Limited

Phones
Factory 1992
Office 2931
Residence 345

Spectator Building, Hamilton, Ont.

Toronto Representative, WALTER HUNTER 105 MacDONALD AVE.
Montreal, STINSON-REEB CO., Eastern Townships Bank Building.

Ritchie Contracting & Supply Co.,

Limited

7th Floor Bower Building, 543 Granville Street,
VANCOUVER, B.C.

Manufacturers and Dealers in Building Materials and Contractors' Supplies

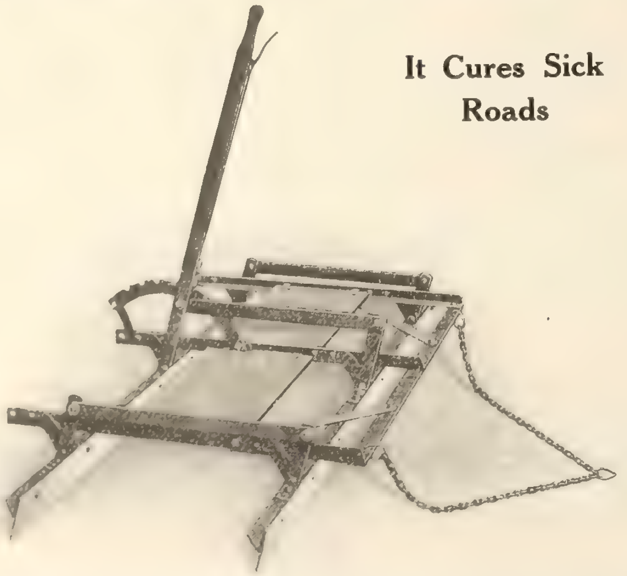
We carry in stock **Ransome Concrete Mixers** and parts.

AGENTS FOR :—**Hart-Ottis Convertable Cars**
Davenport Locomotives
McCully Rock Crushers
Marion Steam Shovels
The Dominion Wire Rope

Write, phone, or call for prices and catalogues.

Our aim, prompt delivery.

Abrico Road Drag No. 1



It Cures Sick Roads

Patented April 28, 1908

Length 8 feet. Width between blades 30 inches. Blades 6 inches. Weight 300 pounds.

Do you want nice smooth roads?

This Drag will take out all of the **bumps** and fill up all the **ruts.**

It is of steel construction and is adjustable, both forward and backward, and can be operated by one man and team.

Do not let distance keep you from having one.

Your order by mail will be given careful attention.

Manufactured by

Attica Bridge Company

Attica, Indiana, U. S. A.

Canadian Representatives desired. Write for special terms.

12,000 Cement Brick A Day—One Man

Material Furnished on the

Peerless Brick Machine

1911 Model

The PEERLESS is a moderate priced machine on which you can make more perfect brick per day than on any other. Brick are made face down and delivered face up on pallet board. Cement brick find ready sale. We tell you how to start a profitable business.

Get Our Catalogue

Peerless Brick Machine Company

No. 8 N. 6th St., Minneapolis, Minn.

Canadian Office: 92 Adelaide St. West, Toronto, Ont.

Machines for Canadian Trade are manufactured in Toronto, Ont.

Awarded Diploma by Canadian National Exhibition,
Toronto, Ont., [illegible]

Renfrew Lime

Will Make More Mortar per 100 lbs. of Lime Than Any Other Kind

and will save you 75 cents per day on each bricklayer. At the end of a year your savings would pay for the Lime.

The quality of **"RENFREW"** Lime is very superior and it will pay you to use it.

"Renfrew" the Lime of Quality

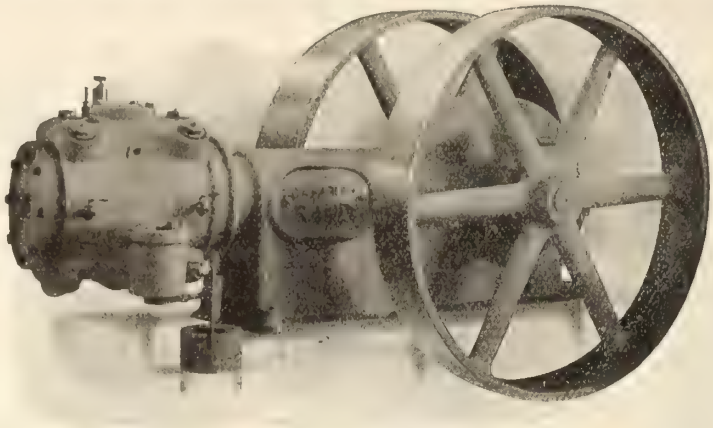
Jamieson Lime Co.

RENFREW, ONTARIO

White Lime - Stone - Grey Lime
Brick - Drain Tile

SELF CONTAINED

COMPRESSORS



Class "NE—1" Straight Line Belt Driven Air Compressor with Enclosed Dust Proof Frames; High Speed Direct Lift Inlet and Discharge Valves; Automatic, Simple and Reliable Lubricating System.

In the construction of the class NE—1 Straight Line Belt Driven Compressor we have given special attention to the selection of high grade materials, that strength may be had without undue size and weight.

The best of workmanship has been employed, that accurate adjustments made at the outset may be maintained over a long period of operation.

Each part has been designed with care and skill, with a full understanding of the requirements of a successful small compressor, and so well designed that we have no hesitation in offering to the trade the class NE—1 as the best machine, of the portable belt driven type, on the market.

As the small compressor, usually a part of the contractor's equipment, is subject to the minimum of attention and not infrequently to abuse and rough usage, it is essential that such a machine be as nearly automatic as possible yet it must be highly efficient. In the design of the class NE—1 we have combined these two essentials and have produced a machine which stands without a peer for this class of work. The unloading device is very simple and highly practical, operating within a very slight variation of pressure, and the oiling device is thoroughly automatic, efficient and reliable insuring perfect lubrication of all parts without attention. All rotating and reciprocating parts are so well balanced and the entire machine is so rigid that vibrations are practically eliminated and the minimum of foundation may be used.

The class NE—1 is built in Standard capacities of 50 to 300 feet free air per minute.

May we not send you our pamphlet K—92 in which we have reproduced a sectional view of this machine showing all working parts?

CANADIAN RAND CO., LIMITED

Commercial Union Building, MONTREAL, CAN.

Toronto, Cobalt, Winnipeg, Lethbridge, Rossland, Vancouver, Halifax
South Porcupine Spokane Sydney

A Chat on Sales

ONE of the important things that you are interested in is information that will enable you to sell more at a lower cost in a better market.

MACLEAN DAILY REPORTS are organized and operated on a plan entirely new in Canada—a plan that will supply you with fresh, dependable, accurate news—telling you DAILY where there are possible buyers, what they want and when they want it.

This information is obtained by our own staff of reporters and correspondents, by personal interview with people in authority.

Our Service tells you about the proposed operation long before the other man knows. It enables you to select from the whole field those opportunities that promise the most profit and which you can handle to the best advantage. It enables you to follow up all sales possibilities persistently and aggressively.

Ask us to tell you what it will cost to keep you informed every day on all the live sales possibilities relating to your business. Ask us to send you specimen reports.

MacLean Daily Reports Limited

220 King St. West
TORONTO **ONTARIO**

Hercules Waterproofing Compound

Manufactured in
Powder and Liquid Forms
by
The Hercules Waterproof Cement Company
BUFFALO, N. Y., U. S. A.
Distributors in:
Niagara Falls, St. Catharines, Welland, Hamilton, Toronto, Ottawa and Montreal

ABSOLUTELY the only Waterproofing Product on the market giving Impermeability with Increased Tensile and Compression Strength to Concrete.

The report of Mr. Peter Gillespie, Lecturer of Applied Mechanics, University of Toronto, shows by the use of 2% Hercules Compound thoroughly mixed with dry Portland Cement before the addition of sand or water, an average Increase in Tensile Strength of over 10% together with Absolute Impermeability, as compared with the same mix of the Portland Cement without the incorporation of Hercules Compound.

While this increase as shown in Mr. Gillespie's laboratory test is very considerable and makes Hercules a factor in all concrete work, the result secured by Engineers on cubes containing a 1-3-5 mix, and made after the manner of the construction work for which they were tested, has shown an increase of from 18 to 25%, together with Absolute Impermeability. CAN YOU BEAT THIS?

Hercules Waterproofing Compound is not an experiment. We can furnish photographs showing work and furnish letters from Engineers, that positively places Hercules Waterproofing and Strengthening Compound in a class by itself.

Circulars, Catalogues and General Information cheerfully furnished upon request.

"Hammer Brand"
Hard Wall Plaster

HARD-WALL PLASTER
HAMMER
BRAND
HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Works Destroyed by Fire — Now Rebuilding

Rock Channelers
For Sale

We offer for immediate delivery F. O. B. cars Niagara Falls, Ontario:

Two Sullivan "Z" Channeling machines, latest type, to be run with air, Machines equipped with air reheaters, 30 feet sectional track, and all tools. Full outfit of "Z" or gang bits to cut 12 feet, and stock of repair parts.

These are swivel head machines and have been used only a few months; are in perfect order and can be seen in operation on our work, Queen Victoria Park, Niagara Falls, Canada.

For Photos and Full Information Address:—

Purchasing Agent,

The Ontario Power Company
of Niagara Falls
NIAGARA FALLS, ONTARIO.

COFFERDAMS
AND CONCRETE WORK

Cofferdam at Southampton; 40 feet x 12 feet, 14 feet deep.

We are experts at this work and before you close a contract, get our figures. We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

The Contractor's "Money Saver"

Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment --- Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto—write us **to-day.**

MACHINE
PAYS FOR
ITSELF
IN A FEW
DAYS.

" Little Giant Floor Scraper "

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

Tel.
Main 4155

We are now
in the
Sand Business

Our Wagons hold 2½ Yards
High Grade Sand and Prompt Delivery

Rogers Supply Co.
28 King St. West,
Toronto

WHY IS KITON
Superior to Ordinary Tar?

BECAUSE:

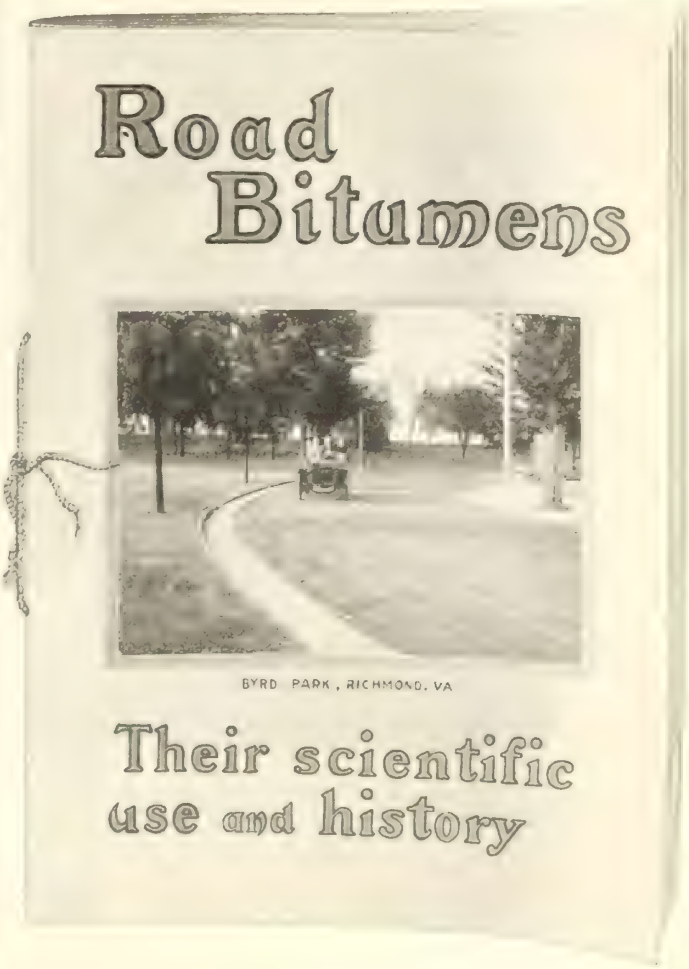
KITON is free from inflamable organic solvents, and therefor far less combustible than tar.
KITON is soluble in water, and in this diluted form can be applied to any surface, whether rough or smooth, hot or cold, wet or dry, as easily as paint. As soon as once dry, **KITON**, like Tar, is absolutely insoluble in water and permanent. Hence its use for

Weather and Waterproofing

KITON will cover a larger area than the same weight of tar.
KITON will do the work better and quicker.
KITON is so easily handled.
KITON needs neither fire nor tarkettle.
KITON will never run, if exposed to the heat of the sun.
KITON will stick positively to any surface.
KITON will take any whitewash, or a finish coat of plaster or cement.
KITON can be coloured.
KITON has none of the drawbacks of tar, but has all of its advantages, and then some.
KITON is cheaper in the long run.

ASK FOR PRICES AND SAMPLE!

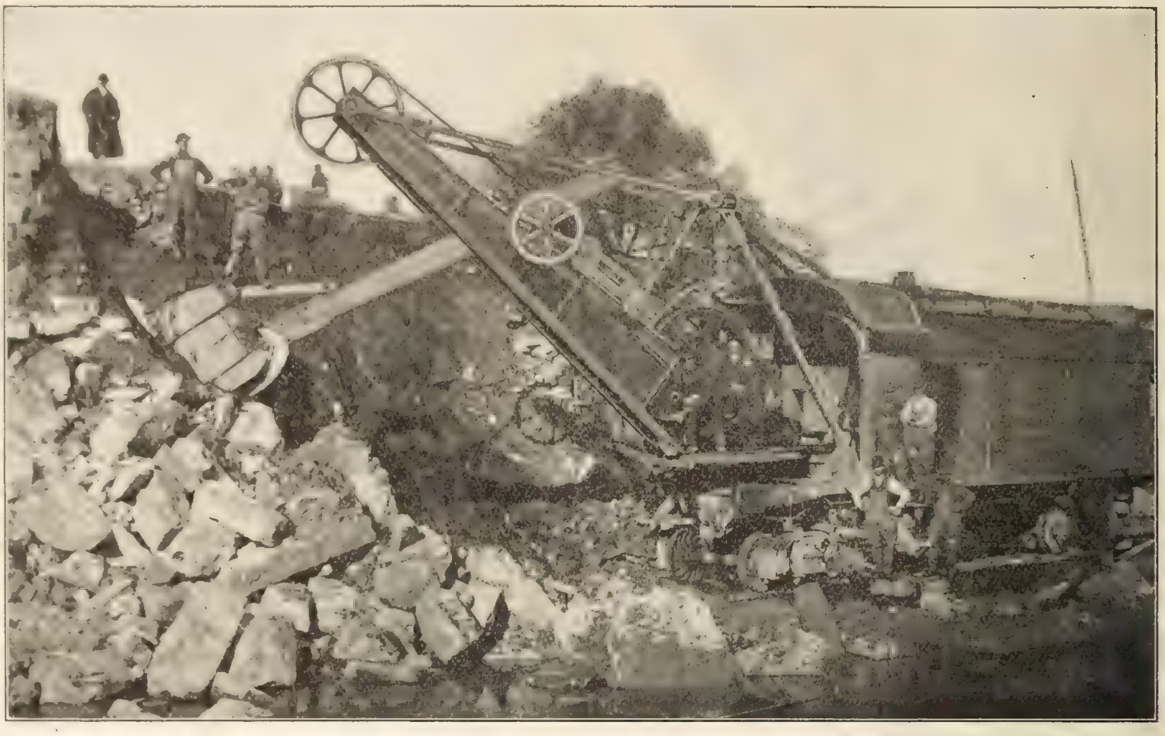
F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.


Road Bitumens
BYRD PARK, RICHMOND, VA
Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a phamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement
Company
First National Bank Building
CINCINNATI



Class 45—16—2½ Atlantic Shovel built for Edgar S. & L. W. Reade, Contractors
At work on the construttion of the Canadian Light and Power Company's Canal, at Valleyfield, Quebec, Canada

BUILT BY
MONTREAL LOCOMOTIVE WORKS, LIMITED

Atlantic Steam Shovels are different from other steam shovels. They are built along lines established by experience. They have direct wire rope hoist and a locomotive type of boiler. They are designed and constructed along well tried out principles, and do the most work for the least cost.

WIRE ROPE HOIST

exerts a direct pull on the dipper and substitutes friction of a rope with one sheave for that of a chain with from four to six additional sheaves, greatly increasing the efficiency of the shovel and decreasing cost of maintenance.

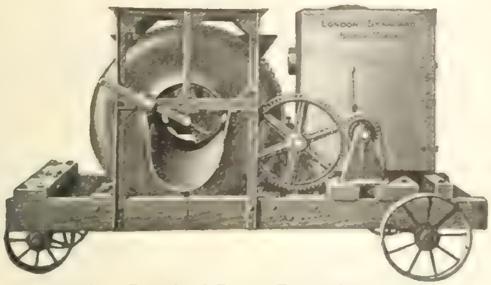
Wire rope is safer than chain because it does not break without giving warning. It shows signs of wear by breaking strands and can be replaced at a regular shut down. Chain breaks suddenly, causing suspension of work until it can be repaired.

Behind each Atlantic shovel is the knowledge of requirements in the Contracting field, and the application of this knowledge in using the right materials in the right places.

Every part is made in jigs or to gauges, and every repair part is sure to fit. We are prepared to furnish repair parts at short notice from our works at Longue Pointe, Montreal, Canada.

MONTREAL LOCOMOTIVE WORKS, LIMITED

OTTAWA BANK BUILDINGS, MONTREAL, CANADA



London Standard Batch Mixers

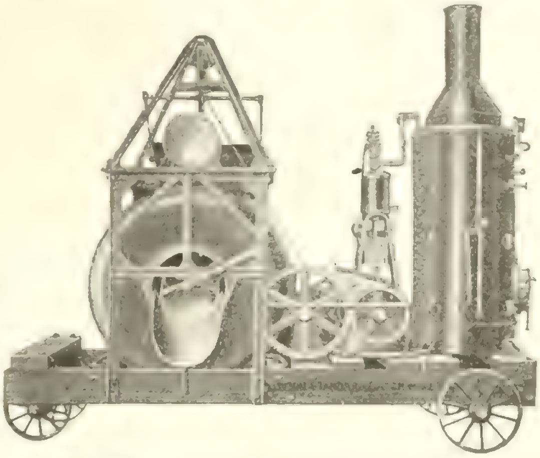
THE LONDON STANDARD DRUM BATCH MIXERS are made in four sizes, namely, one-third yard, one-half yard and one yard batches and are furnished with any equipment.

THE MANY NEW AND IMPROVED FEATURES of the London Standard Drum Batch Mixers appeal to every contractor desiring a mixer of this type. WE CAN GIVE YOU THE BEST VALUE FOR YOUR MONEY of any Firm doing business, BECAUSE we manufacture only Concrete Machinery, and on this account we can sell you a machine at very much less cost than Firms who do not manufacture their own machines but handle a concrete mixer along with other lines of goods.

London Standard Drum Batch Mixer No. 1
Equiped with Gasoline Engine

We also Manufacture—
FACE-DOWN BLOCK MACHINES
CEMENT BRICK MACHINES
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES
SEWER PIPE MOLDS
ORNAMENTAL MOLDS SILO CURBS
ADJUSTABLE SILL, STEP AND WINDOW
CAP MOLDS FRICTION HOISTS
And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.

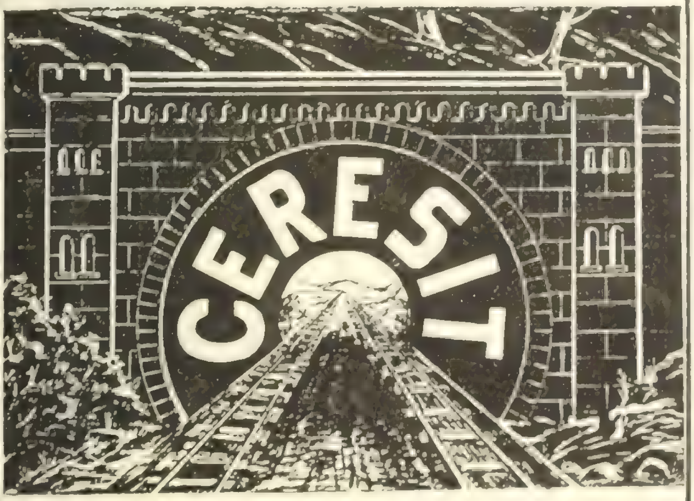


London Standard Drum Batch Mixer No. 2 equipped with Steam Engine and Loading Skip

London Concrete Machinery Co.
Limited
19 Marmora St., LONDON, CANADA

We are the Largest Manufacturers of Concrete Machinery in Canada

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.



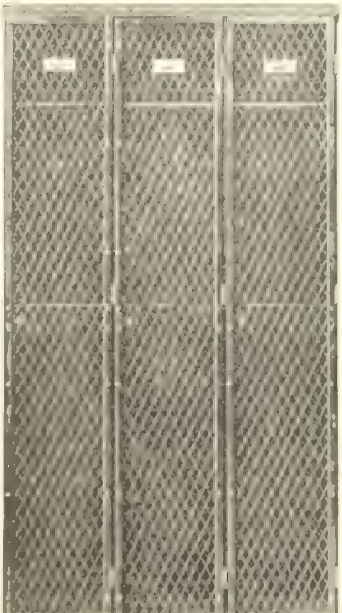
No Wet Cellars No Damp Basements

Ceresit is a cream white paste readily dissolvable in water. This water is used instead of plain water for mixing Cement, Mortar or Concrete.

Ceresit Waterproofing Co.
115 Adams Street, Chicago

Canadian Agents
Eadie Douglas, Limited
Montreal, Toronto, Ottawa
Grose & Walker, Limited, Winnipeg
Dean Thompson, Vancouver

'Meadows' Metal Lockers



Make friends because of their substantial construction and unique features. We make several styles and sizes of these lockers. We'll know what you want if you just hint at your requirements.

Send for our interesting booklet entitled
"Locker Lore"

GEO. B. MEADOWS
Toronto Wire, Iron and Brass Works Co. Limited
TORONTO, CANADA

EADIE-DOUGLAS LIMITED

HEAD OFFICE: 12-14 University Street, MONTREAL

Building and Mechanical Supplies and Specialties

BRANCH OFFICES:
TORONTO, - - 65 Victoria Street
WINNIPEG, - - 445 Main Street
OTTAWA, - - 198 Queen Street

REPRESENTING

Leeds Fireclay Company

Burmantofts Architectural Terra Cotta and Enameled Brick. Used by leading Architects and in representative buildings throughout Canada.

"Keystone" Fireproofing Company

Keystone Gypsum Partition Blocks and Furring. Fireproof, Soundproof, better and cheaper than Terra Cotta.

"Esco" Steel Coating and Preservo

A Waterproofing preservative paint for steel, wood and concrete. The solution of all paint difficulties. **PRESERVO—A preservative and waterproofing** for canvas.

"Terrano" Flooring Co'y of Canada, Limited

Terrano Jointless, sanitary flooring. Laid throughout the world, in hospitals, schools, hotels, private houses, power plants, factories, warehouses, etc.

Alphons Custodis Chimney Construction Co.

Custodis Radial Brick and Concrete Chimneys. Are in service in the largest plants in Canada and are lasting monuments to good judgement and business enterprise.

Edward Darby and Sons Company

"Pen Dar" Metal Lockers are the standard throughout Canada. The strongest and best constructed metal lockers, in all different styles and prices.

Mellows & Company Limited

Eclipse Lead Covered Glazing Bars for skylight Construction. Last a lifetime without any painting or repairing. MELLOWS STEEL SASHES AND CASEMENTS.

"Insulyte" Company Limited

A complete organization for the selling and installing all classes of insulating material.

B. F. Sturtevant Company

(Eastern Canada Only)

Sturtevant Electric Vacuum Cleaners, simple, effiicient and lasting. Ventilating and Heating apparatus, engines, motors, etc.

Send for catalogues and descriptive matter on any of the above lines that you are interested in.

THE Ideal STANDARD COMPANY LIMITED

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

STANDARD

"That which is set up as a unit of reference."
"A form, type, example, model, used as a basis of comparison"

Ideal

A standard of desire. An ultimate object of aim.
A mental conception of what is most durable.

Such are our wares

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 May 31, 1911 No. 22

Crop Prospects Excellent — Trade Buoyant

The excellent crop prospects in Western Canada are having a stimulating effect upon the building trade in all sections. The volume of general trade is showing a steady increase and there is a feeling of greater confidence in all departments. The favorable outlook naturally causes great activity in business. Money is in greater demand than ever and a shortage for the fall season is prophesied. Real estate activity is on the increase and big deals are announced from all parts of the country. From the present indications it would seem reasonable to assume that 1911 will make new records in construction, municipal work, general development and immigration. Few labor troubles are noted and stocks of supplies are plentiful in the principal centres.

In the east a good volume of business is maintained and there is noteworthy activity in residential and commercial building. The extensive schedules of municipal work in the larger cities tends to stimulate other branches of trade and the building industry is the first to feel the benefit. The demand for the principal commodities used by builders is well sustained. Brick has been in demand at Toronto, Ottawa and other points, and there has been a strong call for sewer pipe and cement from municipal contractors. Prices remain normal, however, with fair supplies in prospect. At Montreal, cement is in good demand and is quoted in car lots, f.o.b., Montreal, at $1.35 to $1.40 per barrel of 350 pounds, bags extra. At Toronto, the quotation for car lots is $1.70 a barrel, a cut of 15 cents being made, however, in the case of larger purchases. City dealers are asking $1.90 for smaller parcels. At Toronto, red and buff pressed brick are selling for $18 delivered, and $17 at the works. Wire cut bricks for foundation work remain unchanged at an average of $11. At both Toronto and Montreal there is an active demand for lumber with little variation in price, however. At Toronto there is a good movement in hemlock, which is held firmly at $17.50 to $18. Spruce flooring in car lots is worth $22 to $24; British Columbia shingles, $3,30; pine, $32 to $40 a thousand; southern pine dimension timber, $30 to $45; common stock boards, $28 to $33; cull stocks, $20. Steel goods are notably buoyant in all sections of Ontario. An upward trend is looked for in paints and oils.

Industrial expansion at Toronto continues apace. The latest instance is the projected extension of the Massey-Harris Company's works by the erection of a large storage warehouse and other improvements that will run into many thousands of dollars and give employment to an additional 500 to 700 employees.

The City of Vancouver in the Limelight

The city of Vancouver seems to have a prize assortment of ignoramuses in its aldermanic department. In this respect it is something like Victoria, Regina, Winnipeg, Toronto,— in fact all other Canadian cities. We have just noted an account of a meeting of the board of works of Vancouver, in which one of the worthy aldermen of that progressive city took it upon himself to enlighten the city engineer with a sample of his rhetoric, which, according to the local press, was such as to be described only by dashes. The dissension, if such it can be called, occurred because the newly appointed city engineer, Mr. Fellowes, desired more time to investigate certain work which had been recommended for one of the wards. The alderman expressed the opinion that the sooner the engineer learned that he was the servant of the public the better it would be for him. We would suggest that the sooner the public discovers its error in placing ignorant, uninformed men in representative positions, the more satisfactory returns it will obtain from its expenditures and the more enthusiastic its "servants" will be in its behalf.

Municipal engineering continues to attract a few good men, but we wonder how long it will continue to do so. The thought occurs to us that when such cities as Vancouver, Victoria, etc., advertise for a city engineer, they should include in the list of qualifications desired:—**the hide of a rhinoceros.**

Toronto Makes Another Blunder

The city council of Toronto has again distinguished itself. After showing some intelligence in engaging Capt. Leslie to raise the broken section of the intake and bring it to shore, and when this arduous work, beset with many peculiar difficulties, had been practically completed after eleven weeks' persistent toil, the council decided that Capt. Leslie was not equal to the job and ignominiously fired him. A few days later Capt. Leslie brought the intake to shore and received the congratulations of everybody—except the council.

Capt. Leslie has an excellent record extending over 30 or 40 years. During this time he has been entrusted with a great deal of salvage work for Lloyds, of London, England, and other well known corporations. He it was, it will be remembered, who raised the Allan liner, Bavarian, which sunk in the St. Lawrence river a few years ago and which had practically been abandoned by everybody else, and it was Capt. Leslie who, in 1898, raised the wrecked Cornwall bridge for the New York & Ottawa Railway Company. But it would take too long to give his record. The point is that he has been eminently successful in his undertakings and that after coming to Toronto and succeeding on a particularly thankless piece of work, he is stigmatized by the city council as inexperienced and incompetent.

The Toronto city council is quick to detect any blunder, or fancied blunder, on the part of its engineering department. Certain of its members seem to labor under the impression that they have some special call to distinguish themselves in this way. The question is whether they would not be better employed in cultivating a little horse sense; in learning the danger of trying to apply a smattering of knowledge and less experience to really difficult problems, and in appreciating a good man when they get one.

Honor to Whom Honor

Mr. A. S. Johnson, editor of the "Cement World," of Chicago, writes us in reference to an article entitled, "Who Invented Portland Cement?," published on page 53 of our issue of May 10. According to Mr. Johnson, the I. C. Johnson mentioned in our article has very recently retracted all claims to having been either the original inventor or the manufacturer of Portland Cement and our correspondent assumes rightly that the technical press in the United States and Canada will be only too pleased to ascribe the honor where it properly belongs, namely to Joseph Aspdin, of England. No one, he says, would dispute the fact that Portland cement, as it is now manufactured, has been an evolution, but this fact affords no reason why a man who has been dead for more than half a century should be stripped of his laurels. Mr. Johnson concludes by referring us to an article in the February, 1911, issue of the "Cement World," which is based on data secured recently in England by careful, personal research.

Clay Products and Printer's Ink

It is pretty thoroughly demonstrated now that the right way to promote brick and other clay products is through the exploitation of knowledge, says the Clay-Worker. The clay manufacturing trade itself has known to the qualities of its material and the comparative ease with which it can be used in place of flimsy material, but until this knowledge is widely exploited it is not doing the good it should. It is making other people, the general public, know these things that does good for the industry. That is why proper promotion consists in exploiting knowledge.

This is true with almost everything in the way of merchandise offered the public, and of practically all forms of advertising. The best and most lasting advertising is that which consists in exploiting knowledge. One may by catchy phrases and misrepresentation build up a temporary trade and gain a passing advantage, but real good of the permanent kind only comes from a basis of knowledge. Knowledge of a thing and presented in such a way as to appeal. In other words, the use of facts, attractive facts, if you have them, but facts none the less.

There are two sides to this thing of exploiting knowledge. One is that knowledge is the only rational basis, knowledge of facts for the permanent upbuilding of the trade, and the other is that a knowledge of any kind or of anything is not of material value until this knowledge is exploited and made public.

To make a great study in scientific research is of itself important to the world only when the knowledge is exploited. That is the way it is with the knowledge and new facts developed in connection with the brick and clay products business. The way to promote the industry and to insure its growth is to exploit all this knowledge and get it before the public. Through the use of printer's ink, through talking and through every means calculated to properly exploit knowledge that is of value and use to the public and will contribute to the progress of these products.

The Brick Manufacturer and the Contractor

One excellent result of the movement in the different building centres for the promotion of brick and other clay products has been to bring in closer touch the brick manufacturers and the contractors and builders. They get together for a common purpose and work together shoulder to shoulder to promote the use of brick and other building materials in this class and in so doing they cultivate a closer acquaintance and better harmony generally. This is of itself so beneficial that if nothing else had been accomplished it would be worth the time and effort expended in the promotion of brick products. In other words, this is an indirect result that like the side issue in connection with many an undertaking gives promise of amounting to more in the end than any other one thing in connection with the movement.

It is perfectly logical that the brick manufacturet and the contractor and builder can work together for each other's mutual benefit and progress, but it has been a fact too often in the past that instead of working together in harmony they have been in the attitude of antagonizing each other. The antagonism is unreasonable and uncalled for and will never result in good for either. It promises to be all wiped out now and a general effort made at promoting brick products. It may and probably should result eventually in more mutual gatherings of brick producers and brick users for the sake of keeping in touch and keepin gacquainted. Even with or without the brick promotion business this is an idea that should be fostered and encouraged, this getting together of the men that make the brick and the men that put them into the walls. It is a thing that will not only help the progress of the brick business, but will make life pleasanter, easier and more worth while to the brick manufacturer and to the building contractor.

The Science of Management

Frank B. Gilbreth, the well known New York contractor, began life as a bricklayer. This trade had stood still for 4,000 years. Pharaoh's workman at Thebes and Gilbreth's workman at New York used the same kind of bricks, the same composition of mortar, the same motions on the part of the workman. Gilbreth began to use his mind on the processes of trade. "What is the first motion I make?" he asked himself. "I take a step to the right. Is that necessary?" To eliminate that step, he needed only to bring the pile nearer to his hand. "What is the second motion?" he enquired. "I stoop and pick up a brick. That means lowering and raising 200 pounds two feet. Need I do that?" Bring the pile up to one's hand by some mechanical means, and the workman need not stoop. "What is the next process?" he enquired again. "I look the brick over, so that I may get no chipped surface on the outside. How can I eliminate that?" The answer to this third problem was the answer to all. Gilbreth, counseled by his wife, devised first an adjustable scaffold and then a carrier for bricks. Cheaply paid helpers arranged bricks and mortar in the carrier. The materials, all inspected and sorted, came up to the workman at his waist level. He could take up brick and mortar with one simultaneous motion of both hands. In brief, Gilbreth reduced the number of motions in laying a brick from eighteen to five or six.

While testing his improvement, Gilbreth made the first step toward adjusting the inevitable differences between scientific management and union labor. He was putting up a building in Boston. The Bricklayers' union there, as elsewhere, has a "maximum scale." No member of the union may set more than a certain number of bricks each day. Gilbreth saw the leaders. "If I can't have the bricks laidmy way, I'll make my building of reinforced concrete" he said. "At this rate, bricklaying promises to become a lost art. If you will waive your maximum, I will give your men $6.50 a day instead of $4.50, and I won't overlook them, either." The union agreed. This was a twelve-inch wall with two kinds of bricks and "drawn joints." The best record for that class of work had been 120 bricks an hour to the man. In the last half of the job Gilbreth's gang, working under teachers on the new method, laid 350 an hour to the man.

Specializing in Architecture

The general idea of specializing has apparently taken firm hold of the public mind. In accordance with present-day belief we find employers of men, whether lay or professional, thoroughly imbued with the notion that in order to receive services of greatest efficiency specialists must be consulted. No doubt there is reason for a large measure of this feeling. A surgeon who is repeatedly performing a certain type of operation must necessarily acquire a high degree of skill in its performance. In like manner, a lawyer devoting all of his professionel efforts to the conduct of cases involving certain questions of law would naturally be looked upon as possessing knowledge and experience that would render his services of greater value to interests that required advice regarding similar questions than would be those of a general practitioner.

It is questionable, however, if this same theory is capable of broad and general application. For example, can an architect who has designed a great number of buildings of a given class or type be confidently looked to for the most successful solution possible of any given problem belonging to that class, if we consider the matter broadly? It is obvious that the specialist, barring some unusual circumstances, would furnish a plan well-nigh perfect in its practical workings. In all probability the mechanical excellence of the building would be greater than could be expected with any degree of certainty from one less experienced; but how might architectural growth be affected if we admit an age of specialists? Is not the architecture of the specialist's building in danger of partaking in character rather too much of its numerous predecessors belonging to the same class? Would there not be a tendency toward utilizing what had been found to fairly meet the requirements in numerous previous instances rather than to study and develop something new, which, while involving some element of experiment, might prove the key to real progress? It would seem possible that the tendency toward specilization so much encouraged by the general public might be, in the case of architecture, in a sense opposed to development. Moreover, it is by no means certain that architects in general relish the thought of becoming known as specialists. It has not been conclusively shown that they are ready as a profession to acknowledge that, because some members may perhaps have a considerable knowledge of theatre building requirements, they are less competent to plan a bank building; or that their knowledge of domestic architecture is any hindrance to a successful solution of the office building problem. Judging from such expressions as we have been able to secure, it seems pobable that accidental circumstances and the public demand have had more to do with the making of architectural specilists than any peculiar fitness, inclination or purpose on the part of the architect.

It will, perhaps, be argued in some quarters that one man cannot make himself familiar with the requirements of all the various types of buildings. As a matter of fact, the underlying principles of design and construction are not different for the various classes. The differing requirements are principally those of plan and equipment, none of which are of such great complexity as to be impossible of mastery by an architect of wide general experience, giving his mind to the subject even for the first time. The mechanical features also are not so totally unlike in the various types of buildings. Sanitary equipments, heating and ventilating plants, lighting, elevators, all of these subjects are perfectly familiar to the architect of any building and his knowledge of them would probably be sufficient to readily enable him to adapt them to the peculiar or special requirements of the building under construction.—American Architect.

Some pessimists are inclined to think that labor-saving devices are invented by persons endowed with a large and active hookworm. In one case at least laziness was at the back of an important invention. It was a lazy switchman who hit on the idea that made the distance signal possible. It 1846 a switchman who had to attend to two station signals some distance apart, decided to save himself the trouble of walking to and fro between them by fastening the two levers together by a long piece of wire. A broken iron chair served as a counterweight. The wire ran on into his hut, and there he sat nightly and worked the two signals without setting foot outside. This went on until he was found out, and reprimanded, and promoted.

The province of British Columbia will make a special effort to secure the construction of the war ships that are to be stationed on the Pacific coast. These vessels will comprise four cruisers and six torpedo boats. The designs were prepared by the British Admiralty. It will probably be some time before the contracts are let.

Vice-president Whyte, of the C. P. R., looks for a record breaking crop this year. His estimate for the three prairie provinces is 200,000,000 bushels.

Stone crushing plant in operation at Valleyfield

Seventy-ton Bucyrus shovel digging rock in winter

The Deepening of the Beauharnois Canal

Particulars of Interesting Work at Valleyfield, Que.—Large Amount of Pumping Required During Excavation—A Specially Designed Foot Valve

The passing of this month marks the completion of the deepening of the Beauharnois Canal at Valleyfield, Que., for the Canadian Light and Power Company's project. The work has been in progres for the past year. In this time approximately two hundred thousand yards of earth and seventy-five thousands yards of rock have been dug out of the bed of the canal by Messrs. Fraser Brace & Company, of Valleyfield and New York city, the contractors for this section of the work.

A new intake structure to control the admission of the water from Lake St. Francis into the canal has been built at the entrance. Beside the four Tainter Gate openings, there is a boat-gate opening of 50 ft. wide and 34 feet deep for the admission of boats into the canal while the power plant is in operation. At the intake, provision has been made for future enlargement of the plant by the construction of extra piers and cribs.

There were no unusual features in connection with the works, except the large amount of pumping required to unwater the excavation. The upper part of the old Beauharnois canal had never been unwatered, and the local people were almost unanimous in declaring that the unwatering was an impossibility. By the construction of a heavy cofferdam, 600 ft. in length, the waters of Lake St. Francis were successfully cut off. The water remaining in the canal was drained away through the town sewers by means of centrifugal pumps. The unwatering of the excavation required the constant working of five 12 in. and three 10 in. belt driven centrifugal pumps. The motive power is electricity purchased from the Montreal Cotton Company of Valleyfield, special transmission line having been run across the canal to furnish the 500 h.p. required.

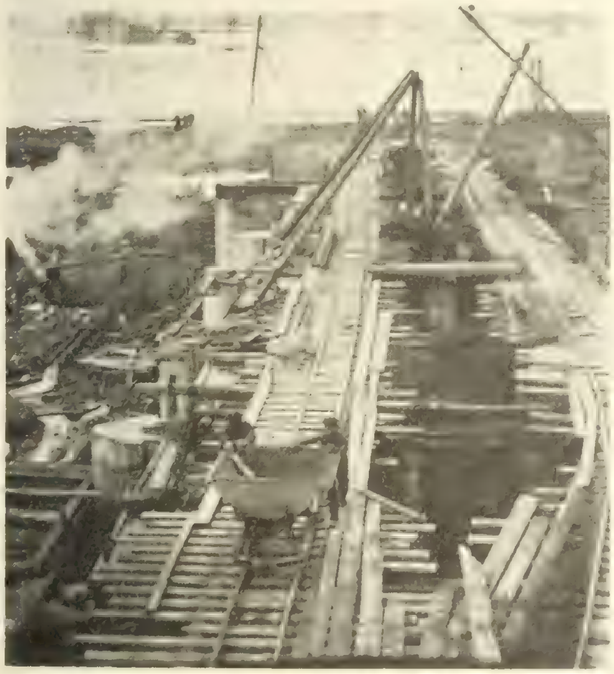
Operations were continued all winter. The only difficulty experienced with the pumping was with regard to the freezing up of the priming lines and the idle pumps. Small auxiliary steam plants at each pumping station were used to keep a small supply of hot steam blowing through the pumps when not running. Pipes exposed to the weather were wrapped in heavy felt for protection. This was found to be quite sufficient for the severest weather as long as the water in the pipes was in motion. Early in the work, direct-connected centrifugal pumps were used, but the experience of the contractors disclosed that these were not suitable for the constant work, because the conditions of the work made it impossible

Concreting and crib construction at new intake

Rear view of gate piers

to install anything but temporary foundations for the pumps.

A serious difficulty encountered was in the foot-valves of the large pumps. Eventually, the contractors designed a special foot valve, which they had made up in Valleyfield, and which they are now using on all pumps. These differ essentially from any foot valves on the market. They are so light and inexpensive that spares are kept constantly in all of the pumping stations. Some of the pumps lifting to a height of 39 feet are being driven at a speed of 520 revolutions a minute. The speed was raised in order to increase the output of the pumps without adding to their number. It, of course, required the installation of much larger motors than are usually required for the same pumps.



Constructional view of operations from top of mixer

Five belt-driven pumps in the Valleyfield canal

The engineers for the Canadian Light & Power Company are Messrs. J. G. White & Company, of New York City. Their local representative is Mr. Jos. D. Evans, resident engineer, who covers the entire work between Valleyfield and Cote St. Paul. His section includes six miles of canal work and the power house, and attending structures at St. Timothee, and the steel tower transmission line between St. Timothee and Cote St. Paul, as well as the substation at Cote St. Paul. The power house work is being done by Mr. Geo. W. Nicholson of Montreal. A large amount of very difficult culvert work on the canal has been carried out during the past winter under the direct supervision of Mr. Evans.

The accompanying illustrations are from the progress pictures of Messrs. Fraser & Brace & Company's work at Valleyfield.

Completion of Big Dam in Alberta

There has just been completed at Namaka, Alta., the great dam which has been constructed by the Southern Alberta Land Company, and which stands at the head of the huge irrigation canal which will bring into cultivation no less than 416,000 acres of land. The building of the dam, which, acording to all accounts, is entitled to rank among the great engineering feats of the West, was under the direction of Mr. A. M. Grace, chief engineer of the Southern Alberta Land Company, and the contract for the work was carried out by the Carter-Halls-Aldinger Company, of Winnipeg, with Mr. D. Stillwell as superintendent of construction. The intake consists of two concrete spill dams which raise the Bow river to a hight of 11 feet. These dams are capable of taking care of a flood of 120,000 cubic feet per second. The flood record of the river at Calgary is 54,000 cubic feet per second. These two spill dams are separated by an island two miles in length and 1,800 feet wide. They are connected with a high embankment equal in length to the whole island, thus keeping the water from making a new channel for itself through the island. The structure itself is of solid concrete and contains five steel gates, each of which weighs nearly two and a half tons.

Concrete walls in wet ground were made water-tight by the use of steel plates in the recent construction of the sewage-pumping station at East St. Louis, Ill. As the pump floor is several feet below the level of the normal ground saturation, great precautions were taken against inflow of water. The foundation slab, 7½ ft. thick, was waterproofed near the middle with asphaltum and waterproofing compounds mixed with the cement. In the side walls, from a level below this waterproofing layer, steel plates were placed at a distance of 1 ft. from the back face. They were riveted into a complete shell as placed, and the joints painted with asphaltum.

The city of Montreal will expend one million dollars in paving work this season. Mr. Geo. Janin, chief engineer for the municipality, is asking for an appropriation of nearly four million dollars, of which one million is for pavements, half a million for sidewalks and the balance for sewers, drains, water mains and similar work.

Among recent incorporations at Winnipeg we note that of the Canada Building Supplies Company, Limited, organized primarily to handle various building lines manufactured by the firm of Francis Ritchie & Sons, Limited, Belfast, Ireland.

Notes on Concrete Sidewalk Construction

A Branch of Municipal Work in which Progress has been Slow—Practical Suggestions looking to Improvemement in Contracting Methods

By J. B. Landfield

The field that I have to deal with—street concrete work—is not a large one, but it is none the less of sufficient importance to justify attention and study. The laying of sidewalks and crossings and the building of concrete curb and gutter have not kept pace with other branches of concrete work in point of development, and there has been a general tendency to regard them as rather inferior branches that required little technical ability or experience. The reason for this is not far to seek. With the great progress of structural concrete work the larger contractors found their hands full of work that gave them better returns with less effort, and therefore sub-let sidewalk work that came to them, or declined it altogether. At the same time the foolish struggle for cheapness on the part of shortsighted municipalities as well as individuals, brought into the field hundreds of untrained and ignorant contractors who counted their own time the same as that of their laborers and who undertook sidewalk work at prices far below what an intelligent and honest contractor, who cared for his reputation, would think of doing it for.

One result of this was the general impression that anybody could do street concrete work and that this branch of work did not deserve the technical study that was being given to other lines. The other result was that the country from one end to the other abounds in rotten sidewalk and curb and gutter work, large quantities of which will have to be relaid. I can count out to you several cities in which such work has caused concrete to fall into disfavor and to-day natural stone is used almost exclusively. It is up to us to change this condition of affairs and we can best do so by improving the methods in use and by educating the public to pay a fair price for good and honest work.

Suggested Methods

The suggestions I have to make as to the methods of sidewalk work are two in number. One has to do with the consistency of the top coat, and the other with the manner of finishing the surface. On the question of consistency of the top coat the book authorities are divided or non-committal. One book says put in the top coat fairly dry while another advises making it about as thin as mortar. A third gives the wise advice not to mix it too wet or dry. What is the best practice and why? I have given this subject a good deal of study and wide observation, and as a result I am going to offer for your consideration a method that will astonish many of you. I shall preface this by stating my opinion that 90 per cent. of all sidewalk men put in their concrete, and especially the top coat, entirely too wet. It is frequently argued that by so doing the top coat bonds better with the foundation course, but as a matter of fact this reason is fallacious. On the other hand a mortar-like top is apt to show a different degree of construction in setting from the foundation course, and when it is troweled in finishing, neat cement is flushed on the top and forms a thin brittle surface that is likely to scale off in time. Besides this if your work has not been timed just right your finishers have to wait until the surface is dry enough for finishing or surreptitiously sprinkle dry cement on it to take up the superfluous moisture. The manipulation of concrete surfaces for finishing should take place at once before any portion of the particles have commenced to crystalize. To disturb them by troweling a half hour later is to invite hair-cracks and crazing.

The method I have to suggest consists in putting in a top coat with only a little water in it and then tamping it to bring sufficient moisture to the surface for immediate finishing. This not only makes a fine bond with the foundation course and gives you a dense closely-grained top, but it insures you against checking and crazing. I have heard it objected that this method would add to the cost, but when the contractor tried it he found that it was cheaper to pay for a little more tamping than to have finishers waiting around for the surface to dry out, especially when they were drawing extra pay after quitting time.

The tamping of the stiff top coat is closely connected with the other subject of which I wish to speak, the method of finishing the surface. This consists of two operations, striking off and floating. When the top coat has been tamped and the surface is just right for finishing, we take a piece of angle iron with a handle at either end to use as a strike-off stool. One man on each side of the walk grasps this by the handle and they proceed to strike off the surface with a sort of sawing motion, each in turn bringing his end forward so as to prevent the surplus material being brushed off at the side. With a little practise they become very proficent in this and they consume but little time. In fact this method of striking off facilitates floating to such an extent as to make a considerable saving. Of course the surface may be struck off when wooden forms are used, but the side rails are frequently rough and uneven and the stakes are a hindrance. With steel forms the method works to perfection, for the strike-off stool moves easily along and the resulting surface is absolutely even.

The floating of the surface is a point on which there are many opinions. I presume that a majority of sidewalk men to-day finish their work with a trowel, but I am inclined to consider this bad practice. A few years ago in many cities a smooth glassy finish on a walk was greatly admired, and to produce this it was necessary to use a steel trowel and to use it vigorously. In fact the general tendency when a trowel is employed is to use it too much, and over-troweling flushes neat cement to the surface and forms a thin hard coating that seems all right at first, but which afterwards scales off. Furthermore the glassy finish on a sidewalk is neither good looking nor practical. There is constand danger of slipping on it. To avoid this they used to stipple the surface where there was any considerable grade, but can you picture to yourself anything uglier than a stippled walk?

Improved Practice—and Otherwise

The improved practice is to strike off the surface as described, and then finish it with a wooden float. A large number of concrete men use this method now, but the practice ought to become universal. As soon as the walk is floated the surface should be lightly brushed with a dampened brush. The result is a handsome even surface on which there is no danger of slipping and which in appearance excels the best natural stone. In making the top coat it is very desirable to use a certain amount of crushed granite or some other similar material with your sand in order to make a more durable surface and at the same time avoid the dirty yellowish color that common sand frequently gives. Of course it is of the highest importance to see that the sand is clean and free from any trace of loam as this is certain to make "soft spots" which soon show wear.

I cannot leave the subject of finishing without calling attention to two practices that disfigure the walks in many cities. One of these is the custom of marking off the walk into small blocks, say 18 ins. to 2 sq. yd. Sometimes a line is run about 6 ins. from the edge on each side, making a sort of border. The men that have their walks laid in this manner of course have no realization of how ugly they look. The best looking walk is that laid in regular squares that correspond with the width or nearly so. A 5 ft. walk laid in blocks 5 ft. sq. without any fancy work or curlecues is handsomer than any possible variation. Of course a 4 ft. or 6 ft. walk may be equally well laid in blocks 5 ft. long, instead of 4 ft. or 6 ft. but the point I wish to make is that in walk building simplicity spells beauty. A few cities still retain the custom of making sidewalk blocks in 2 ft. and 2½ ft. sizes in the shop and then laying them, but this never makes a job that maintains its good appearance for any great length of time. For this the walk must be laid on the spot.

The other practice is one for which engineers are frequently responsible, and that is the custom of crowning the surface of the walk. Happily this practice is not very prevalent. The two main reasons why it is bad to lay sidewalks with a crown are first that one-half the drainage is on the wrong side, that is, away from the gutter, and secondly that they are particularly ugly at points of intersection on account of the hollow left. A crown on a cross walk, if not too high, is very desirable and preferably it should be slight in the centre of the walk and rather steep at each side, where the road material banks up against it. Another clever steel form has been made for the construction of crosswalks, which operates on the same principal as that already described. The division plates are convex on one side and the strike off is made not on the side rails, but following the division plates as guides.

Some English Data on Resurfacing Macadam

The following data for the resurfacing of main roads through an urban district in the Lake District of England were given in a recent issue of The Surveyor by M. C. Watson, surveyor, to the Ambleside Urban District Council. The roads are located about five miles from a railway station and have to bear a very heavy through carting traffic all the year round, and in the summer months have to withstand probably a heavier coach and motor traffic than those of any other part of the country, besides a service of heavy motor buses to and from the station. The stone used is from the council's quarries, and is known as a blue limestone. It is of a very varying nature and difficult to break, the price paid for quarring being 36 cts. per cu. yd. The following refers to work done in January. The weather was wet with spells of frost. The length of road rolled was 930 lin. yds.; the superficial area, 4,500 yds. The cost was as follows:

	Per Sq. Yd., Cts.
Stone, 300 cu. yds. at 96 cts.	6.40
Binding	.26
Scarifying, 39 hours at 7d.	.12
Roller drivers' wages, 21 days at $1.20, including getting up steam but not scarifying. The actual time rolling being about 7 hours per day	.56
Manual labor	.68
Team labor, including hauling rough stone from quarry to depots to be broken, greatest distance 2 miles, also watering	2.40
Fuel, 60 cwts. smokeless coal, including carting, at 45 cts. per cwt.	.60
Total	11.02

This gives a cost of 53 cts. per lin. yd., or $943 per mile for a road approximately 5 yds. wide; the average width of roadway being 7 yds., one cubic yard of stone covering about 15 sq. yds. Number of yards rolled per day was 44 lin. and 214 super. The following relates to work done in February. The weather was wet and there were spells of frost. The length of roadway rolled was 648 lin. yds.; the superficial area was 4,500 sq. yds.

	Per Sq. Yd., Cts.
Stone, 366 yds. at 96 cts.	7.80
Binding	.28
Scarifying, 36 hours at 14 cts.	.12
Roller driver's wages, 16 days at $1.20, actual time rolling about 8 hours per day	.42
Manual labor	.82
Team labor, also watering (work nearer to depots)	1.30
Fuel	.60
Total	11.34

This gives a cost of 78 cts. per lin. yd., or $1,390 per mile for a road average 7 yds. wide. The actual width of the roadway in this case was 13 yds. One cubic yard of stone covered about 12 super. yds.; number of yards rolled per day, 40 lin. and 280 super.; the slight increase in cost over the first figures due to extra metal put on some parts of the road. Nothing has been allowed in the above figures for depreciation of roller, or for the driver's wages when not able to roll on account of frost—which amounted to 28 days out of 65—wear and tear of tools and carts, or for horse keep, and so forth. A cause of considerable trouble in winter time is the way in which horses are shod in this district. On the first signs of frost the horses are fitted with block shoes, capable of holding four sharps in each shoe, and this class of shoe is used throughout the winter—frost or no frost. The result is that great damage is done to the roads through the loosening of the metal.

Victoria Harbour Terminals of the C.P.R.

Extent and Importance of the Operations now in Progress—Noteworthy Features of the Work—Methods of Construction Employed

Contractors: John S. Metcalf Company, Limited.

While most people are aware that the Canadian Pacific Railway is doing development work for a new lake terminal at Victoria Harbour, Ont., the extent of the construction operations at that point is not realized to many.

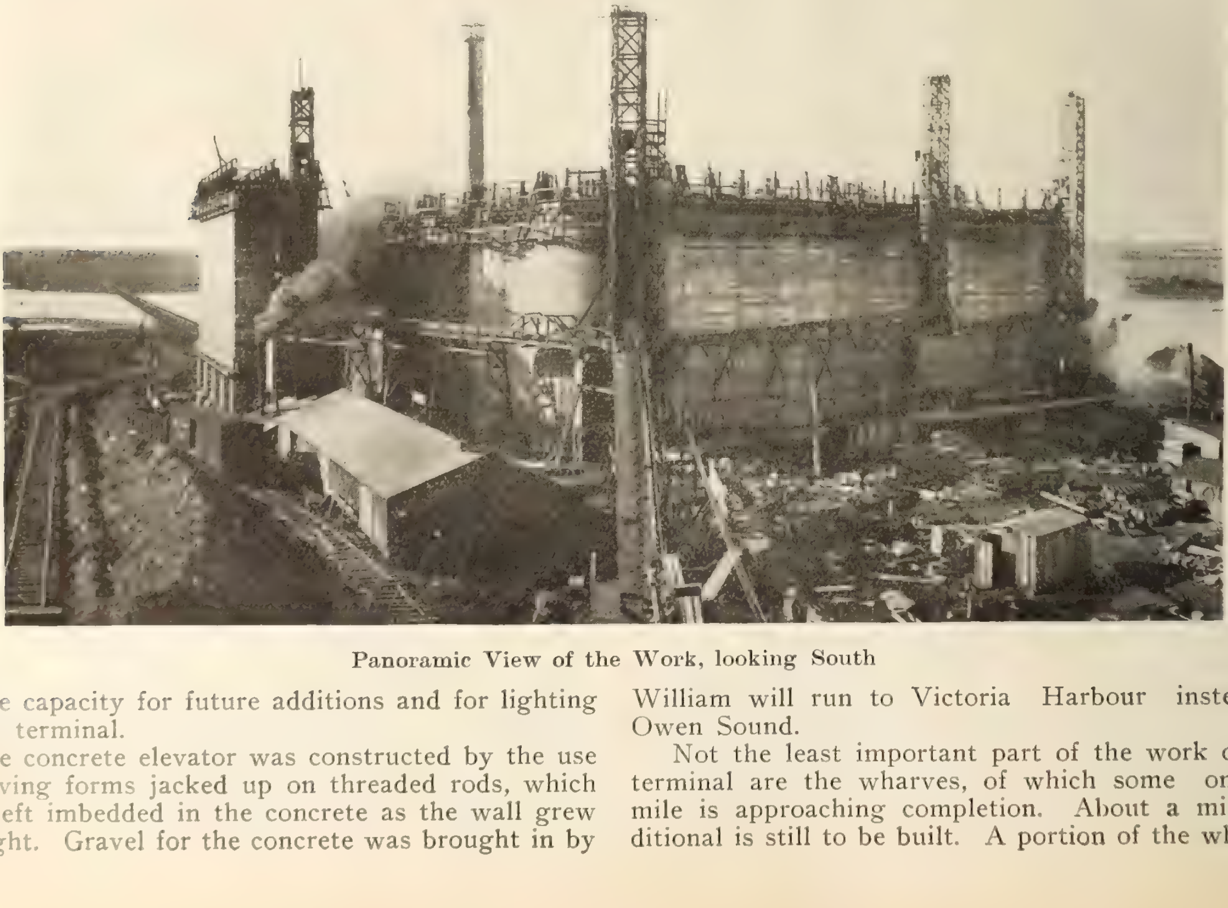
A slip-way, 600 feet wide and 3,000 feet long, is being dredged, with a channel from deep water in Georgian Bay. The channel and the slip-way are excellently protected by the numerous neighboring islands and the points of the main land.

The terminal may be said to be divided into two portions. One side of the slip-way has been reserved for the grain terminal and what was formerly Maple Island has been transformed into a peninsula by very extensive filling between the main land and the island. On the island, a 2,000,000 bushel reinforced concrete grain elevator has been constructed and provisions have been made for an ultimate grain storage capacity capacity of 10,000,000 bushels at the terminal. The elevator consists of two steel marine towers travelling on wheels along the wharf, for unloading vessels, a 2,000,000 bushel reinforced concrete storage elevator, and a shipping elevator with a car loading capacity of 200 cars in ten hours. A power plant of 1,000 kw. capacity, using Babcock & Wilcox water tube boilers, and Westinghouse—Parsons turbines, furnishes power for the present elevator, with reserve capacity for future additions and for lighting of the terminal.

The concrete elevator was constructed by the use of moving forms jacked up on threaded rods, which were left imbedded in the concrete as the wall grew in height. Gravel for the concrete was brought in by train, screened and washed in a plant built for that purpose on the island, and conveyed from the screning plant to storage bins over four mixers. The illustration shows the concrete walls in course of construction, and the general lay-out of the gravel conveying and concrete mixing plants.

On the side of the slip-way, opposite to the grain terminal, the package freight and passenger terminal is being constructed. The principal buildings of the freight terminal are a flour shed, 800 feet long, and a freight shed 700 feet long, with provisions for future extensions. The frame-work of these buildings is of steel, with concrete end and fire walls, and wooden roof and floor. Each building is somewhat less than 100 feet wide, and one storey in height. A view is given of the flour shed in course of construction, showing the steel work.

Practically the entire extent of land on this side of the slip-way was made by train fill. The foundations of the flour and freight sheds are on piles driven into the fill. At the centre end of the slip-way the passenger station will be located. Other buildings at the terminal will include round-house, machine shop, coal pockets, ice-house, ships' laundry, Y. M. C. A. building, etc. It is anticipated that, beginning with the present summer, the passenger vessels of the C. P. R. now running between Owen Sound and Fort William will run to Victoria Harbour instead of Owen Sound.



Panoramic View of the Work, looking South

Not the least important part of the work on the terminal are the wharves, of which some one-half mile is approaching completion. About a mile additional is still to be built. A portion of the wharves

Flour Shed; Building South and Wall. Doors Piled Inside of Shed.

consists of concrete cribs, but the greater part will be wooden cribs. All wharf tops will be of reinforced concrete.

A new town is springing up adjacent to the Victoria Harbour terminal and the post office of the new town has been officially named Port McNicoll in honor of the First vice-president of the railroad.

The flour and freight sheds were designed by the engineering department of the Canadian Pacific Railway, who also arranged the general terminal lay-out. The designing engineers for the grain terminal and the wharf construction were the John S. Metcalf Company, Limited, of Montreal and Chicago.

The John S. Metcalf Company, Limited, have completed the construction of the first unit of the grain terminal, of 2,000,000 bushels capacity, and they are now at work building wharves, flour shed and freight shed. The flour shed was practically completed on May 1st., and the freight shed will be available for this summer's business.

Elevator Completed

Mr. G. G. Ommaney is resident engineer in charge for the Canadian Pasific Railway.

The concrete-mixing plant used in connection with the roadbed work of the Detroit United Railway is so arranged that there is no manual labor at any stage in its operation except in emptying cement bags and trimming, following the deposit of the material by the mixer. Dump cars, loaded with gravel by a locomotive crane at a dock in the suburbs of Detroit, are drawn to place by an electric motor car, and their contents dumped between the rails of the track under construction. A car loaded with cement bags is then run over the gravel pile and the cement deposited. A concrete-mixer plant, mounted on wheels, and provided with a scoop, is run forward and a shovelful of the cement and gravel mixture scooped up, raised, and discharged into a five-cubic yard hopper above the mixer, from which a charge of two cu. yds. is delivered to the mixing-drum. While the material is being mixed the machine is run back to the point of delivery and a batch of concrete is dropped between the rails and leveled off to the correct height by lowering a leveling-board at the rear of the machine and running forward slowly. Trimming and final leveling is done by a gang of three or four men who follow behind the mixer. The capacity of the mixer is about 180 cu. yds. in 10 hours, or, counting in the time of transfer from line to line, repairs, etc., about 300 cu. yds. in 24 hours. The entire cost of the plant for concreting, including the mixer, crane, 27 dump cars, two motor cars, gravel dock, and miscellaneous tools, is approximately, $57,000.

Noteworthy Developments in Construction

The Wolle Method of Making Reinforced Concrete Poles Described—Concrete Standpipes - - Old Wire Rope used in Reinforcing Timbers

Poles of reinforced concrete for both high and low-tension electrical current are finding an increasing demand in Germany, and Mr. Karl Roessle, in a recent number of "Beton and Eisen," describes these used for the "Hohenzollern-Sportpalast," a large skating rink in Berlin. Because of the decay of wooden poles, the high price of iron poles and the constant attention required for their maintenance, the management decided to employ reinforced concrete. The simplicity of the system used, the Wolle, made it possible to cast all poles in wooden forms at the site of the work. Both the fabrication and the erection were accomplished without the use of machinery, and the cost was comparatively small, being about one-half that of iron poles. The poles were lightened by adopting a tapered section, reducing the size from about 1.2 x 1.8 ft. at the bottom to 0.46 x 1 ft. at the top, and, at equal distances for the greater part of the length, holes were cut through which not only reduced the weight, but also presented less surface for wind pressure in the direction of the smallest resisting moment.

The height of the poles, which curved over at the top, was about 44.3 ft., of which 8.2 ft. was in the ground, which brings the arc light about 32.8 ft. from the ground surface. Heavy signs, suspended between posts, increased the bending moment at the ground level. Therefore, a flat iron plate of rectangular cross section, about 3 x 3½ ft., was placed on either side between the ground and the pole extending from the surface of the earth downward. The greatest difficulty experienced was in placing the conduits in which to run the electric wires. The poles were erected by means of wooden shear-legs 29.5 ft. in lenght, and, although the total weight of each pole was approximately 9.259 lb., they were raised without injury when but 14 days old.

[†] Concrete Standpipes

It is interesting to know that the first stand pipe erected in this country was that at Little Falls, N. J., in 1889. To date there have been 53 built in this country and abroad. Of these, thirteen have been erected in New England, which would indicate that engineers and water companies here have more faith in this type of construction than in any other part of the world.

The Aberthaw Construction Co. have built two large standpipes and a tank, the smaller, 40 ft. in diameter and 70 ft. high, at Westerly R. I., and the larger at Attleboro, Mass., 50 ft. in diameter and 100 ft. high to water level.

The Attleboro standpipe was designed on the basis that the hoops take the entire load with the unit stress in the steel of 13,500 lbs. per sq. in. In order not to have the bars too close together, 1½ in. diameter bars were used in two rows, from the bottom of the standpipe to a height of 61 ft. From 61 ft. to 81 ft. a single row of 1½ in. diameter bars were used. From 81 ft. to 100 ft. the bars were 1⅛ in diameter. In the upper 15 ft. of the height, the section of steel was kept constant, although the hoop stresses from the water were constantly diminishing to the top.

The walls of the standpipe started with a thickness of 18 ins. at the bottom and tapered to a thickness of 8 ins. at the top.

In order to space the reinforcing bars an exact distance apart, 4 in. channels with ⅜ in. punched holes through both flanges were used. The channels were set upright at intervals of about 15 ft., c. to c., a ¼ in. rod was passed through the holes, and the hoops were rested directly on the ends of these ¼ in. rods, which are then bent up to secure the hoop firmly. From the height of 61 ft. to the top, 3 in. channels were used for spacers. The floor of the standpipe was 12 ins. thick and met the wall with a curve whose radius was 5 ft. The top surface of the floor was reinforced with ¼ in. square twisted bars 6 in. on centres each way. The foundation consisted of a slab about 18 ins. thick but under the walls of the standpipe the depth of this slab was increased to 4 ft. for the width of 5 ft. A concrete curb 3 ft. high and 12 ins. thick was built around the outside of the bottom.

A gate-house enclosing various valves was erected at one side and access to the interior of the standpipe could be obtained through a passage in the same. The roof was Guastavino tile dome, suitably ventilated.

Method of Splicing Bars

The method using in splicing the ends of the bars together may be of interest. These bars were obtained long enough so that three would reach entirely around the circumference with a lap of 40 diameters at each joint. Two wire loop clips were then used at each splice to insure the bars being held firmly together. By actual test at the Watertown Arsenal these clips alone were found sufficient to secure the full working stress of the bare bars.

From our experience with this standpipe and the one we erected at Westerly later, I believe the addition of considerable vertical reinforcement in the lower 8 or 10 ft. of the standpipe wall would assist very materially and perhaps entirely obviate the formation of a horizontal crack in the lower few feet of a standpipe. The walls under water pressure must increase in circumference. At the bottom of the standpipe, however, this increase in diameter cannot take place owing to the rigid connection of the wall with the floor. It is apparent then, that unless precautions are taken, either by the use of very low stresses in the hoops or by the addition of vertical steel bars, there may be a distinct movement back and forth on some joint in the standpipe. That this movement is present is further indicated by the fact that when a standpipe has been kept full of water for some time the leakage through these joints almost entirely disappears, but on emptying and refilling the standpipe the little dams formed have apparently been broken down as the leakage again occurs as vigorously as at first.

[†] Abstract of paper read before the Boston Society of Civil Engineers by Leonard C. Wason, President of the Aberthaw Construction Company, of Boston, Mass.

In the Westerly standpipe we endeavored to take care of this by increasing the amount of steel. At the lowest foot the stress is 6,000 lbs. per cq. in. This stress was increased 1,000 lbs. for each foot in height, until we reached a maximum stress of about 12,500 lbs. per sq. inch. No vertical steel, however, was used and on filling the standpipe we found that with a maximum head of water that a small line of dampness occurred in a horizontal joint about 3½ ft. above the floor of the tank. This damp place was nearly 30 ft. long.

Quite different methods were used in erecting the Attleboro and Westerly standpipes. In the case of the former, a large tower of pine timbers, properly braced, was erected. On the top of this were placed two bul-wheel derricks. Concrete was handled in a bottom dump bucket swunp to the position desired by the dericks, dumped into boxes and shovelled into the wall. Wooden forms were used.

At the Westerly standpipe, the plant consisted of a simple concrete mixer fed by wheelbarrows. The mixed concrete was delivered to an ordinary elevator hoisted to a hopper erected on the elevator tower where it was dumped, and from which it was fed into wheelbarrows and shovelled into place. Steel forms were used.

Steel and Concrete Pipes in Sewerage Work

Combination steel and reinforced concrete pipes were used by MM. Coignet and Bonna in constructing the sewerage works of Paris at Acheres sixteen to eighteen years ago. In the extension of these works the same type of pipe is still being used. As described in the "Transactions" of the Concrete Institute, of Great Britain, they are made in sizes from 12 in. to about 3½ ft. in diameter, and consist of a thin steel tube lined inside and out with concrete reinforced with circumferential and longitudinal bars. One of the larger pipes laid about seventeen years ago was cut out and removed four years ago in order to put in a junction. It was found that the steel was practically clean and that the concrete was lying close against it. There were slight traces of rust on part of the inner reinforcement, but the rusting action, it is stated in the above publication, seemed to be dormant. Nothing has been spent on repairs to the reinforced concrete during the sixteen years or so it has been in service and investigations made about a year ago on pipes in place showed that the steel and concrete are free from deterioration. A modification of this pipe, which is known as the Bonna pipe, has been used on two rising mains of the Paris sewerage system, which are under a maximum head of about 56 ft. These mains are each about 6 ft. in diameter, with steel shell about 0.15 in. in thickness, which forms the inner lining. In these pipes concrete is placed inside the shell, the strength being contributed solely by the outer reinforced concrete casing, which is 4 in. thick and is reinforced in the conventional manner. All these pipes were molded in a pipe yard and laid after curing, the joints being made by a sleeve similar in construction to the pipes themselves. The large rising mains were made in sections each 8.2 ft. long.

Electrically operated rock drills are used on a rock-drilling scow employed in the harbor of Trieste. According to the "Genie Civil," power is supplied to each drill by an electric motor which is geared to a crankshaft. This effects the compression of a helical spring once in every revolution by means of a connecting rod. The energy thus stored when suddenly released causes the downward blow. The average number of blows per minute is 380 and the stroke 2 1-3 in. The holes can be driven at angles up to 15 deg. from the vertical and the drill rods can be fed down so as to give holes 6.5 feet deep and 3.2 in. in diameter. These are driven in moderately hard limestone at the rate of 3¼ feet per hour.

Anchor bolts in bridge abutments were pulled out of the concrete, and not broken off at its surface, in the overturning of steel trusses in the Meadow Valley washout on the San Pedro, Los Angeles & Salt Lake Railroad. The bolts used were the standard 1¼ x 36-in. round, with horizontal notches. The flood which displaced the bridges rose 8 feet above the rail. In every case failure of the anchorage was in this manner, according to Mr. J. G. Van Zandt, who gives some details of the action of this flood of the last year in the "Railway and Engineering Review." He observes that this seems to point to the need of a more secure anchorage of bolts than that is generally provided according to current practice.

Old wire rope is used in certain French mines for reinforcing old timbers, especially the cap pieces of sets. In the "Engineering and Mining Journal" Mr. Louis Bourdoire states that the old rope is stretched longitudinally around the timber, the ends being held fast between the roof and the top of the cap piece so they can not slip. When a timber starts to bend under the weight of the roof part of the tension is taken up by the wire cable, enabling a miner to put in additional supports before a fall occurs. The ends of the cap pieces are tapered and grooved deep enough to receive the rope and prevent any part of it projecting beyond the bearing ends of the timber pieces.

Embankment protection is secured in many cases on the Missouri Pacific Railroad by a foundation mudcell mattress consisting of two tight layers of brush with about 1 ft. space between, the dike being built on top. This form is used in place of the standard mattress, where the water does not contain so much sediment as to cause sinking before the dike is stateed. No rock or riprap is used.

Timber flume bottoms, rapidly worn away by the scour of gritty material, were protected during a part of the work on the Denny Hill regrade in Seattle, Wash., by white-iron lining plates. The rapidly moving waste water, carrying the hydraulically excavated material down 3 and 4 per cent. grades in the flumes, wore away unprotected planks in a couple of weeks, and also quickly wore out a floor of 6 x 6 12-in. blocks protected by studding with 20-penny nails, which was tried as a substitute. This led to the adoption of the iron plates, 24 x 34 in., and ½ in. thick, with a crown of ¼ in. in the middle to spread the material and prevent centre scour. This subjected the side boards to more severe service, and to meet it, triangular strips, readily renewed, were nailed in the angle between the bottom and the sides.

Efficient Maintenance of Rural Highways

Strengthening Weak Road Foundations—Care in Steam Rolling—The Economy of Tar Macadam as a Road Surfacing Material*

The question of the efficient and reasonably economical maintenance of rural highways is one of much complexity, presenting many difficulties, not the least of which is that of inducing the road authorities and finance committees to adopt the broad and far seeing policy on which the just combination of efficiency and true economy depends.

The lack of proper or adequate foundation structure, which is one of the pronounced features of most of the rural highways in the kingdom, presents an important initial difficulty, and one which (in view of the far greater strain that practically all roads are now subjected to, by reason of the rapid growth of mechanically propelled traffic) will become from year to year more important, and at the same time less easy of solution.

It has many times been said that one cannot expect to maintain a road unless such road has a good foundation. This is a very attractive and guileless proposition, yet practical road engineers have to get along as best they can in this connection, maintaining in good condition, year after year, roads the chief characteristic of which is the lack of the very foundation said to be indispensable for satisfactory maintenance.

The practical road engineer realizes that it is economically impossible to refound even a small proportion of the badly founded roads which already exist, and that he must take them for what they are and make the best of them. It is here that there has been and still is a large field for the exercise of ingenuity in supplying on the surface of an existing road an element of strength which, in some measure at all events, takes the place or serves the function of the foundation which ought to be there, but isn't.

Strengthening Foundations

One of the methods adopted by the author to increase the strength of a weak road foundation is to excavate along each side or shoulder of the road to a depth varying from 10 to 15 ins. and about 15 ins. in width, packing into these excavated side trenches good chalk flints or other suitable hard material of gage varying from 6 ins. downwards to 3 ins., to be afterwards well rolled down. This method not only serves in some measure to underdrain the road, but by strengthening the "shoulders" of the road prevents lateral "spread," and appears to prevent that collapse of the road centre or crown which is so characteristic of many weak roads.

The question of steam rolling is not without interest, and the author considers that, generally speaking, steam rollers for country work should not exceed 8 tons in weight, and even at this weight should be carefully used for the purpose for which they are intended; i. e., consolidating the road metal, not rolling it to destruction.

The manner and extent to which some rollers are misused or overused must be a source of joy to steam-roller makers and granite merchants. It will, however, be conceded that the former are, in these latter days, deserving of some measure of sympathy. They must have had a good time in some respects when some "genius" propounded the idea of fixing spikes on the driving wheels of the roller for scarifying purposes. It is now, however, becoming generally recognized that it is not essential or even desirable for the proper repair of an existing road to tear it to pieces by means of a scarifier. Of course, in some cases a moderate amount of shallow scarifying is desirable to improve the cross section of a road where the crust is of ample thickness.

The necessity for a thorough remodelling of the method of road repair and maintenance—which may be said to be the outcome of the revolution in use to which roads are being and will be subjected—has given birth to many ideas and has resuscitated others. Very numerous and diverse are the new binding materials which have been suggested—even sugar and treacle have not escaped attention. The consensus of practical opinion, however, appears to point to bituminous products of various kinds as affording a range of materials readily available applicable as a binder or flux for use with an aggregate ordinary road stone.

Value of Tar Macadam

There can be little doubt that properly prepared tar macadam forms one of the best, most practical, and ultimately economical preparations for road surfacing work. Considerable difficulty in its use has hitherto been found when the tarred material had to be carried long distances to the point of the user. The author therefore views with satisfaction the probability that this difficulty is being overcome. It is now possible to purchase or hire machines which have been specially designed to perform the operations of screening, drying, and tar coating the road stone at the depot or on the roadside, thus greatly facilitating the use of local materials or of such particular description of road stone as the surveyor prefers to use, and even of such suitable old material as may be scarified from an existing road surface.

Four years ago the author laid down experimental stretches of road in various parts of England on the following lines: Upon a cushion ¾ in. thick of tar mastic or binder, composed of ½-in. gage clean granite chippings mixed with Tarvia (12 gals. to 1 ton of chippings), was laid a two-stone thickness of 2-in. gage clean broken granite. This was lightly rolled down into the mastic, and when the aggregate was just "placed," not consolidated, by means of a 6 or 8 ton roller, the surface was dressed with hot liquid Tarvia, using 1 gal. to 3 or 4 sq. yds. Over this was sprinkled and brushed in a small quantity of the above described mastic or matrix, sufficient being used to fill the surface voids, and the whole was then rolled to a consolidation, a few dry chippings being used in order to prevent the matrix sticking to the roller wheels. The result is a compact, resilient, and waterproof surface, which is still in good condition and has only required a top dressing of Tarvia and chippings once since it was laid. The extra cost of this work over the ordinery water-bind work with the same description of aggregate was 6 cts. per sq. yd., which has been more than saved in maintenance alone in 1½ years. Ordinary water-bound work on the same road has required renewal every third year. The work above described shows no real signs of wear, and will only require an occasional top dressing to carry it on for many years.

---

* Paper by Arthur Gladwell, Engineer Eton Rural District Council, presented at the Second Irish Road Congress, Dublin, Ireland, April 19 21, 1911.

It is also easy to patch this class of work: indeed, so simple is the operation that the road man who has it to do is in danger of losing interest in his work.

From the point of view of the advocates of mud binding the only disadvantage of this class of work is that one cannot get any mud off it for use as binding elsewhere.

The author firmly believes in the value of surface dressing of roads with good dehydrated tar, but only as a temporary expedient and only on roads having a good surface. In his opinion it is more economical in the long run to incorporate in the structure of a road crust a certain definite quantity of bituminous binder than to use the same quantity (by recurrent applications) on the surface only.

Art in Brickwork

In the very great furore that has been aroused by the wide and judicious advertising of matt brick the great serviceability of dry press brick has at times been obscured, says the Clay Worker. Some would argue that a rough brick should be used under any and all conditions, for the sake of the artistic effect which their intelligent use unquestionably produces, but this stand often is not well taken. For instance, it seems that in the downtown district of a large and smoky city, where after two or three years all brick look much alike, it is a mistake to endeavor to obtain a wall tone resembling that of a Persian rug. The grime of the city soon reduces the warm color of the drawing-room to the full monotone of the factory. This is especially true of the rough face brick, which readily catch the dirt. Besides which, matt brick are the result of an attempt to approximate the rough brick which were popular for town and country use in which are reflected the thousand and one marvellous achievements of modern engineering science, is to perpetuate the anarchronism of applying fifteenth century methods to twentieth century conditions.

The strictly utilitarian office building of to-day requires clean-cut perfection in all its appointments, and is none more than in its facing material. The same thing can be truly said of apartment buildings in crowded sections of the city—in fact, of any building of considerable proportions in closely built districts.

Automatic vacuum street cleaners are the latest innovation under consideration in Toronto. These machines have met with some success in Austria, and a number of cities in the United States are experimenting with them. Street Commissioner Harris, of Toronto, who has been making the enquiries, admits that the vacuum principle of cleaning can only be applied successfully to pavements having an absolutely perfect surface. We would like to see Mr. Harris trying to operate a cleaner of this type on sections of College, Queen, King, Dundas and other well known thoroughfares in the Queen City. If this proposition is intended for a joke it is ill timed.

The Origin of Portland Cement

"What's this?" asked the City Editor, glaring at the reporter." Here you have in your storey 'The wall was built of Portland cement.' After this, cut out the word 'Portland.' We don't want to advertise any particular brand of cement."

"I thought it meant Portland, Me., where it's made."

"It is none of your business to think anything. You are wrong, besides. It means Portland, Ore., and the West must pay for all its advertising in this sheet, or I'll know the reason why."

Grout instead of bituminous filler for brick pavements is recommended by Mr. Samuel Whinery, consulting engineer, in his preliminary report to the commission on city expenditures, Chicago. It is pointed out that the advantage of the bituminous filler lies in the fact that the streets may be thrown open to travel as soon as the filler cools and hardens, which will be well within 24 hours. If the grout filling is used, the street must be closed until the cement sets hard enough to withstand the travel—from 4 to 7 days. Notwithstanding this, the grout filler, in Mr. Whinery's opinion, is so superior and so increases the useful life of the pavement that it should be used, except in the case of busy streets, where closing of traffic would work a hardship.

This is the name of a new book on foundations recently issued by the MacArthur Concrete Pile & Foundation Company, 11 Pine street, New York. After briefly touching upon the various aspects of the problem of attaining permanent and reliable piling foundations, the method of forming the pedestal pile is fully described and illustrated with drawings showing the various stops in the process of bulging out an enlarged base some 3 feet in diameter at the bottom of the stem or column. Actual photographs of piles of this type excavated for inspection are shown.

The succeeding chapters discuss briefly the general nature of pile foundations, how they support their load, considering both a single pile and group piles, at the same time comparing the carrying capacity of a pile of the pedestal type with piles of other shapes. In this respect a synopsis of the most recent data on bearing strength of soils as well as frictional resistance of soil, is given. A chapter is then devoted to the additional carrying capacity provided by the broad base of the pedestal pile, some five tables being given, in which it is shown that the broad base adds to the total carrying capacity of a hundred per cent. or more. The maximum carrying capacity of a pedestal pile, as determined by the safe compressive strength of the concrete forming the stem or column of the pile, is then considered. Succeeding chapters discuss reliability, permanence and stability of pedestal piles, and then there are given photographs and particulars of a number of tests.

A dispatch from London, Eng., records the death of John Passmore Edwards, a great English publicist and philanthropist. Early in life the late Mr. Edwards, who was the son of a Cornish carpenter, went to London with the proverbial shilling. Afterwards he amassed a fortune. Among his enterprises were the founding of the "English Mechanic" and the "Building News." Twice he declined the honor of knighthood.

Mr. Thos. Catterall, who has been president of the Victoria, B.C., Builders' Exchange since [illegible], has retired from that office and Mr. J. W. Bolden has been elected in his stead.

The Importance of Detail in Contracting

Many Contractors Losing Considerable Profit Owing to Leakages in Material, Labor and Equipment—Cases in Point from Actual Experience

By Daniel J. Hauer

Much thought and attention are always given by contractors to all the important features of the large job. They decide whether steam shovels shall be used and how many trains will be needed to serve a shovel, or whether some other style of excavator be used. For the concrete work an elaborate plant is designed, and so on for all the various kinds of work done. This is as it should be, and those who plant is designed, and so on for all the various kinds of work to be done. This is as it should be, and those who plan the best and equip their jobs with good plant should make a handsome profit, if their prices are right, but much money is lost, or if the contract shows a profit, much money that should be made is not made, owing to the lack of attention to details.

To a great extent the details of carrying on a job are left to the various foremen employed. They are supposed to know how to handle the various problems that arise and the routine work economically, but in most cases they do not. If they did, they would not be foremen very long, but would quickly become superintendents or even contractors. Employers seem to overlook this very important fact. The ordinary foreman must be given close supervision if the best results are to be obtained. If the foreman shows marked ability he is quickly promoted.

Some Interesting Cases from the Writer's Experience

This is illustrated by the story of one of the most prominent railroad officials of the United States. As a young man he was appointed as engineer in charge of maintenance on a section of the southern road that was ballasted mostly with sand and mud. Over the whole system the roadbed was rough, but as soon as the train reached the section kept up by this young man the difference was so great that everyone noted it and inquired the reason. The answer was "Blank is in charge here." This piece of roadbed was soon known over the entire system, and Blank's promotion to superintendent, general manager, vice-president and so on up the ladder of success was rapid, and it was only a few years before this old section of the roadbed under a new man was like all the rest of the sand ballasted track. Numerous examples of this kind could be named.

Much money is wasted for the lack of attention to many details of construction work. Recently the writer has been watching the erection of a skyscraper in one of our large cities, paying special attention to the hauling of the structural steel. This work is done by teams of from four to ten horses with heavy trucks. A four-horse team is worth about $1.50 an hour on this job. Day after day from two to six teams will be found waiting near the building to be unloaded. These waits vary from a few minutes to several hours. One day five teams were kept waiting two hours each. Thus this one item was a clear loss of $15, enough to be a handsome profit on these teams' work for a day. This one item of waste on this job which is not finished has been more than enough to pay a handsome salary to a man who may have prevented it.

In tearing down a large building to make room for the tallest office building in the world, the writer noticed that in tearing up the flooring from floor joists, that they were thrown into several piles by a gang of laborers, who afterwards picked up this flooring and carried it to one side of the building and passed it down to the ground to be again piled, and afterwards loaded onto wagons to be carried away. Thus the flooring was piled twice. Once should have been sufficient, and the chances are that the work could have been so arranged that little if any of this flooring needed to be piled, which would have meant the saving of much money on the job. The same thing may be said of bricks torn out of old buildings. They are generally handled oftener than they should be. Every turn of the brick costs money, and it is money that really benefits no one.

This is especially so in bricklaying, and a well known eastern contractor has spent much time devising a system of brick laying that saves many motions in that ancient art, and some of the work previously done by bricklayers is performed by men who are paid smaller salaries. Thus he has made it possible to have a bricklayer do twice the amount of work that he would previously do, without working any harder, thus making it possible to pay these artisans a larger daily wage.

No other class of construction work has attracted the attention of engineers and contractors during the past ten years, as much as concrete, yet in spite of all the thought and study of concrete experts, money is wasted every day both on large and small jobs. When mixing concrete by hand men are allowed to handle their shovels in the same manner as they do in shoveling dirt, yet if the proper kind of a board is used for mixing and the men are taught to handle their shovels the right way, one and two turns of the mass can be saved, allowing from 25 to 30 per cent. more work being done with the same amount of labor.

Only recently the writer had his attention called to the manner in which the materials were being handled on a large concrete job. The plant installation is a large one, and a very large quantity of concrete is mixed each day, yet the cement house house is right up against the battery of mixers, the sand is stored beyond the cement house and stone is all handled over the sand supply. A system of cableways is used to handle the sand and stone. Thus we find that the 4.5 cubic feet of cement which makes up a cubic yard of concrete is handled the shortest distance. The 12 cubic feet of sand needed is handled over the cement, while the 26 cubic feet of stone which make up a yard is handled over the sand and cement. It is evident from this that time, lobor and power is being wasted, and a larger output could have been obtained by having the stone storage closer to the mixers.

The same waste becomes patent in other details of concrete work. Crude and clumsy forms are used and held in place by twisted wire and props which interfere with economical work, when methods could be used that save both labor and materials.

Methods of Handling Earthwork

Almost every construction job has some excavation work connected with it. Nearly every man feels that he is competent to handle earthwork, yet nothing is more difficult. The writer's experience is that the more one has to do with earth excavation and the more study one gives to the subject, the harder it seems to solve problems of excavation. The last word will never be said or written on this subject. A common mistake frequently made in connection with earthwork is in the style of shovel used. In the United States the short handled shovel is used almost exclusively. These are either square or round pointed shovels. Many contractors seem to think it is a matter of indifference as to which is used. Each, however, is suited for a different class of work. The square pointed shovels should be used for earth, while the square pointed shovel should be used for earth and rock together. A man working in average earth will do more work with a square pointed shovel than with the round points, while the latter go under rocks and hold their load in rock material better than the square pointed shovel, owing to the decided curve given to the bowl of the shovel, while the square pointed shovel is much flatter. It is for this reason that the same size square pointed shovel will hold much more dirt than the mud covered shovel.

For handling loose sand a large, flat, square pointed shovel should be used or else a small sized scoop. Coal should never be shoveled with anything but a scoop shovel. If stiff clay is to be spaded in order to save picking, which can sometimes be done, then a real spade should be used as it will cut a large chunk much wider than the blade of the spade, while if spading is done in soft material the best tool is a wide square pointed shovel. Naturally, though, a shovel not being built as strong as a spade, will not last as long, as spading quickly weakens a shovel in the centre, just below the handle.

A short handled shovel should be used when men are worked in close quarters, or the distance to cast the material is short, or the height to which it is to be raised is small. Under other conditions a long handled shovel should be used. A man will do much more work with it than with a short handled shovel. For casting earth any distance it is done much easier and also in throwing dirt to any height. The writer has seen an able-bodied workman throw dirt out of a pit 18 feet deep. This shows what can be done with a long handled shovel, but it is not economical to throw dirt to such a height. This should have been done in two stages. The writer has also seen a man cast earth from a berm ditch into a low railroad bank at the rate of 27 cubic yards per day, which is exceptional work, but such a yardage could not have been handled with a short handled shovel, even by the same man.

Fallacy of the Long-handled Shovel

Many contractors believe that a long handled shovel is a "lazy man's tool," but it is not so. Any tool in a lazy man's hands is a poor tool, but it is the foreman's place to see that the workman handles his tools properly and that he works at a good pace. Often the men will object to using the long handled shovels. This is especially so of Italians. In Italy, very few short handled shovels are used, the long handles prevailing, and Italian laborers are really used to them, yet they must at times be forced to use long handled shovels, preferring the short ones, as they believe they will do less physical work, which is wrong, for with less body fatigue they will handle more material with the long handled shovel. All of these assertions can be readily proven by any contractor by experimenting with the two kinds of shovels for a few days.

In using steam shovels the mistake often made is that the crew in the pit is not large enough. The pit crew cannot be kept constantly at work, and as it looks bad so see men standing around idle, this crew is often made too small. However, when the shovel is to be moved forward every man should work at top speed so as to get the shovel digging again as soon as possible. Thus one or two extra men, although idle at times, might save 10 or 12 minutes' time in moving in a day. This, with a two-yard dipper, would mean from 60 to 70 cubic yards of extra material moved in a day, three or four times as much need to make these two men pay for their wages.

Steam shovels are often used in rock excavation, and do good work, yet there are times when it is more economical to go over the rock with the shovel, stripping it of all the earth and loose rock that can be readily handled by the shovel and then putting in a derrick car, equipped with heavy chains, derrick skips and grab buckets to handle the solid rock after it has been blasted.

Many steam shovels are to-day equipped with small air compressors and plug drills for breaking up boulders when they are encountered. Recently the writer has seen boulders that had to be broken moved in front of the shovel, near to the loading track so that they could be drilled for blasting. This is a mistake, as it prevents the shovel from working while the drilling is being done. The boulder should be placed on the other side of the shovel, so that loading can go on without interruption.

Breaking up Boulders

Much money is lost and wasted in breaking up boulders as done by the ordinary foreman. He seems to think the only thing to do is to get rid of the boulder quickly. This is important, when the boulder is either blocking the work of a steam shovel or a gang of men, but otherwise the cost of breaking up the boulder should be considered as well as the length of time in which to do the work. There are six methods of breaking up boulders: (1) by means of fire and water; (2) by means of dropping heavy weights on the boulders; (3) by means of sledge hammers; (4) by "block holing," that is, drilling a hole in the boulder and breaking it with a charge of explosives; (5) by "mud capping," that is, by plocing the charge of explosive on top of the boulder and covering it with mud; (6) by "undermining," that is, placing the charge of explosives under the boulder in a bed of mud, so as to confine the charge as much as possible. Of these various methods only two are used to any great extent, namely, "block holing" and "mud capping."

(1) The method of using fire and water is economical in some cases, but naturally its use is limited. When timbered land is being cleared up and water can be readily obtained much money can be saved by this method of breaking up surface boulders over any other. The boulder, however, must not be partly buried in the ground, as it will not heat enough to break, but will only crack. In digging cellars in towns and cities the few boulders encountered can be broken up by heating them with waste lumber and then dashing water on them. A little practice soon allows one to gauge how hotthe stones must be to break well. The writer has used this method and has kept costs of the work.

(2) The method of breaking boulders by means of dropping heavy weights upon them can only be used when a derrick locomotive crane or cableway is used. The weight is raised to a height of 20 to 30 feet over the stone and by means of a trip is dropped onto the boulder. Thus, this body of iron, weighing from 1,500 to 3,000 pounds, striking the rock a sudden blow, breaks it up so that it can be handled. Boulders of from one-half to three cubic yards can be broken in this manner by one or two blows of the weight. This method of breaking boulders can be used to advantage on city work where a derrick is used on the excavation, and is of especial use for quarry work. Besides these places it can be utilized in heavy rock cuts and trenches, where a cableway, derrick, locomotive crane or other hoisting device is used.

(3) Breaking boulders by means of sledges is as old as the world, as it has always been done. It is economical for boulders up to a cubic yard in size, but for larger boulders it takes too much time, and the use of explosives will be cheaper. Sledges should not be too heavy and those

weighing from 12 to 16 pounds will do better work than heavier ones. It is the quick, rapid stroke that causes the disruption rather than a slow blow. For small men 12 to 14 pound hammers should be used, but for a large man a 16-pound hammer is about the right size. A man should always hit the stone with the rift as it breaks much easier. When many stones are to be broken and the boulders are large enough, two men working together and striking at the same place will do better work than one man working alone.

(4) Block holing boulders is a well known method of breaking them up. A hole from a few inches in depth to a foot or eighteen inches should be drilled in the rock and the explosives placed in the hole. If the entire charge can be placed in the hole more efficient work is done by the explosives, but frequently it is cheaper not to drill the hole so deep and place some of the charge on top of the hole, covering it well with mud. Boulders of all sizes can be broken up in this manner, but for the smaller sizes, say a cubic yard or less, sledging and other methods should be used, as they are more economical.

(5) The "mud capping" of boulders is used more generally by foremen than any other method. It is easier and entails less labor than the other five ways, but it is the most expensive, as the amount of explosives needed is excessive. For these reasons it should seldom be used except when work is being tied up by the presence of several boulders. Then a few sticks of dynamite should be placed on top of the boulder, plenty of mud placed on the dynamite to cover it well and the fuse lighted.

Undermining Quick and Economical

(6) The last method of breaking boulders by "under mining" is but little used, although it is both quick and economical. In this case the charge is placed under the boulder and mud placed around the dynamite, after which it is fired. This method cannot be used when the ground on which the boulder is lying is soft or made up of loose material, as the force of the explosive will dig up the dirt and not break the boulder. A rock of a given size can be broken up with just half the charge by "undermining" that is needed for "mud capping," and the labor cost is but little more. The rock is not only broken up better but parts of it are often blown out of the excavation. The writer has broken up and moved boulders containing 50 cubic yards or more by this method. Every contractor should teach this method to their foremen.

The writer has used all of these methods of breaking up boulders and has kept detailed cost of the various methods, having from time to time published records of some of his costs.—The Contractor, Chicago.

Trade Brisk at Calgary

Calgary, May 25th, 1911.

Building operations are in full swing here and every trade is taxed to its utmost capacity. The civic authorities are daily setting out work that runs into six figures. During the year it is expected to carry out over 40 miles of water and sewer construction and at present nearly a thousand men are engaged upon this work under Superintendent J. Wilson. Mr. Gardiner, the superintendent of public works, who is a regular western hustler, has some 350 men working on grading and excavation for two subways. Superintendent McCauley, who is another busy man, expects to see 40 miles of track down this year. Three hundred men are at work on this construction at the present time. A network of electric light lines is being placed overhead in all parts of the city, this work being in charge of Mr. O'Brien. Conduits are going down where permanent paving is being constructed. Calgary has aptly been termed a city of mushroom growth. It seems but yesterday that it was a cowboy town and to-day it is a modern city posessing a street car service with twenty miles of track, and having concrete sidewalks, twelve miles of sewers, five miles of electric conduits and twenty miles of boulevards. A large staff of men will be put to work this season on improvements in the parks and on some twenty miles of boulevards, Superintendent Iverson having charge.

Montreal Notes

The work of building the new concrete pier at St. Helen's Island, opposite Montreal harbor, has been commenced.

The Canadian Development Company is making good progress with the dredging of the widened section of the Lachine canal in the vicinity of the Atwater bridge.

The Railway Signal Company of Canada has been awarded a contract for the signalling apparatus to be used in the new union station at Winnipeg, now being built for the G. T. P. and the Canadian Northern railways.

The Railway Commission held a session lasting over three days in Montreal, recently, but little definite result was reached through their deliberations. Most of the important matters were deferred for further hearing in the near future.

The Canadian Metal Seal Company, with an authorized capital of $300,000 and having its headquarters in Montreal, has been incorporated in the name of the following persons: J. W. Blair, F. J. Laverty, G. Dutaud, advocates; G. Dunlop and A. Brennan.

A claim for $21,512 damages is being made by the Bishop Construction Company against the Canadian General Development Company for not accepting the delivery of 18,000 tons of stone and 9,000 cubic yards of sand for the widening of the Lachine canal, and that the delivery was not accepted in accordance with the contract.

The Montreal city council has voted the following sums for public works in the city for which tenders will shortly be advertised: for sidewalks, $500,000; for public improvements in the new wards, $720,000; for water mains, $677,000; for sewers, $616,000; total, $2,513,000. There is, in addition, $1,000,000 available for street pavements.

Chief Tremblay has submitted his report upon the inspections which the fire captains have made of all the apartment houses and the moving picture shows in the city. In regard to the apartment houses, the chief states that "in nine cases out of ten the houses are not provided with proper or sufficient protective apparatus against fire, and in many cases there are no fire escapes at all."

Messrs. Byers & Anglin, building contractors, of Montreal, recently gave an informal banquet to their foremen and the members of their inside and outside staff, numbering about 30 persons. Both Mr. Byers and Mr. Anglin spoke interestingly on the history of the firm and its future policy towards its employees, emphasizing the desirability of cordial co-operation between the various departments. The event is likely to be an annual one with this company.

With the exception of 100 tons of steel for the sixteenth storey of the tower, the steel superstructure of the Windsor Street Station and office building has now been completed. So far about 5,000,000 pounds of steel have been erected, and the steel work has reached a height of 105 feet above the pavement at the corner of Windsor and St. Antoine streets. The tower is in reality a large office building, so that the C.P.R. will have the highest business building in the city. The outer stone facings have now reached the main floor level.

The Hassam System of Street Paving

The building of roads is one of the most important problems confronting civic and municipal engineers in any new country. If this is true in rural sections it is much more so with regard to the construction of urban thoroughfares. Numberless experiments have been carried out and an infinite number of materials have been employed in the endeavor to find a roadbed that would be at the same time suitable for all kinds of traffic, impervious to climatic changes, sanitary, and, as near as possible noiseless.

The Hassam process of laying pavements for vehicular traffic is one that appears to combine, in a high class degree, the above mentioned qualities. This system has been adopted in a number of leading cities of the United States and also in Canada, notably at Vancouver, B. C., under the name of the Hassam Paving Company of British Columbia, and the Canadian Hassam Paving Company at Montreal. The Canadian Hassam Company was incorporated in June, 1910, by Letters Patent of the Dominion of Canada. It has the exclusive control of the Hassam patents for the Provinces of Quebec and Ontario. The manager of this company is Mr. Charles M. Edwards, a resident of Montreal.

Two kinds of pavement are laid under this process. One is known as compressed concrete and is intended for medium and light traffic. The other is a granite block pavement laid on a compressed concrete foundation. This, while intended for the heaviest traffic is comparatively noiseless, and has a fairly smooth surface so that it can be used very satisfactorily in residential sections. The Hassam process is covered by United States, Canadian, French, British and Belgium patents.

Sample of "Hassam" removed from the Oregon Hassam Paving Company's Work at Portland, Ore., by Mr. D. W. Taylor, City Engineer.

Rough Stone in the Foreground; Machinery used in Laying Paving Materials, and the Finished Roadway in the distance.

The Hassam compressed concrete pavement is constructed by spreading, upon a well rolled and compacted sub-grade excavated to the proper depth, about 8 ins. of broken stone passing through rings from 1 in. to 2½ ins. in diameter. The stone is then thoroughly compacted by a heavy road roller and the voids reduced to a minimum. This bed of compressed stone, after being brought to the desired profile of the finished pavement, is grouted by the use of a Hassam patent grout mixer (which ensures the absolute uniform mixture and distribution of the ingredients), with a grout consisting of two parts of sand to one or more parts of the best Portland cement, the amount of grout varying according to the density of the stone. This is poured upon the crushed stone until the grout flushes to the surface when it is again rolled forcing the grout absolutely into all voids and eliminating all air bubbles from the mass.

Upon the top of the pavement thus prepared is placed a thin layer of pea stone which is thoroughly spread and rolled or compressed even and smooth over the entire surface—the pea stone layer to have sufficient thickness to insure the complete filling of the voids in the surface.

The Hassam compression process, it is claimed, forces into the concrete twenty per cent. more stone than any other known method of concrete construction, thereby giving it a wearing and supporting strength nearly equal to that of solid stone itself.

The thickness of the pavement is not less than six inches from the sub-grade to the finished grade of the street.

All street pavements are easily cleaned both by flushing with water and by sweeping. The frequent application of water to some, however, is very detrimental to the binder, quickly rotting it out and leaving large holes in the streets, which constantly increase in size. Water, standing in such hollows, holes or cracks, rapidly makes them larger. The Hassam pavement is unaffected by either rain, snow or frost or other climatic conditions. It is non-absorbent non-permeable. It is of the same density and of the same smooth, level surface at all times. It may be oiled for dust laying without injury. Concrete being a monolith and a nonconductor of sound, this pavement, although hard, is less noisy than most hard surface pavements. In cold or wet weather its surface is not so smooth and glassy as to cause horses to slip or fall; the horse's hoof falls squarely on the gritty surface giving the animal confidence in its footing and it travels without danger. By the very nature of its component materials compressed concrete is comparatively inexpensive and can be easily and cheaply repaired.

In laying the Hassam granite block pavement the foundation, as in all paving work, is of first importance. The foundation of the Hassam granite block pavement is made of the same material and laid by the same process as the concrete pavement; that is to say, upon the foundation described above is placed 1½ of clean sand and upon this sand cushion the granite blocks are laid as closely as possible with joints broken by a lap of at least two inches. The [illegible] of the stone or blocks to be used for the surface is of great importance. This has varied from large flat flag stones several feet square to the modern small cleanly-riven block of about four inches to 4½ inches high, 3½ to 4½ inches wide, and 6 to 12 inches long. When such blocks are laid by modern methods and Hassam machinery all tendency to tiilng out of alignment is eliminated and if the quality of the bond is correctly proportioned to the quality of the stone insuring the even wearing of both, abrasion on the edges of the blocks is reduced to a minumum.

Granite when found in its clearest and best statum and texture seems to lend itself the best of any known rock to the problem of paving. The blocks once laid are supported by sprinkling clean pea stone over them and brooming the joints full with wire brooms. The surface of the pavement is then made even and true by rolling with a steam roller weighing about six tons or by compressing with tampers of not less than seventy-five pounds' weight so as to bring all blocks of uniformly even and smooth surface. After such rolling or compressing the surface is flushed with a grout to ensure the perfect blending of the ingredients. This pavement made of absolutely the best and longest lived materials known is, at the same time, almost as smooth as asphalt. It can be swept or flushed as clean as any so-called smooth pavement since there are no interstices to catch or hold filth of any nature. For obvious reasons a granite block pavement costs more than one built of compressed concrete, the latter being about the cheapest first class pavement that can be constructed.

Canadian Railroad Development

E. A. Studer, formerly at Wesley, Ia., is now located at Swift Current, Sask., where he has a contract on the Canadian Pacific Railway, the work being located six miles south of that place.

The Grand Trunk Pacific Railway, (B. B. Kelliher, chief engineer, Winnipeg, Man.) will shortly call for bids for the erection of a new station in Quebec. Bids for the railway work shops to be erected at Quebec will also be asked.

The Dominion Power & Transmission Company, Limited, Hamilton, Ont., is making a survey for an electric railway line from Hamilton to Galt. The present Hamilton & Brantford line will be constructed, connecting with John Patterson's Hamilton, Guelph & Watrloo Railway, if that road is built.

Three shipments of over 30,000 tons of steel rails have been received on the Pacific coast for use in the construction of the Canadian Northern Pacific Railway, from Port Mann to the North Thompson river, and two other shipments of about 20,000 tons of steel are on their way to Vancouver.

The Acme Construction Company, Toronto, Ont., has been awarded the contract for constructing the proposed electric railways of the People's Railway Company, from Guelph to London, Ont. It is proposed that the line eventually will connect Toronto with Detroit, and form the backbone of a network of interurban lines extending from Collingwood and Owen Sound to Goderich, Port Huron and Port Stanley.

Announcement has been made that the Grand Trunk Pacific extension from Halifax, N.S., to Prince Rupert, B.C., will be completed within the next three years. This line will connect two ports that are open to navigation thoroughout the year, and also will tap a huge wheat belt. It is expected that next month the Grand Trunk Pacific will begin regular train service from Fort William to the foothills of the Rocky Mountains, a distance of 1,500 miles.

The Canadian Northern Railway is reported to have secured the Jesuit College site on Bleury street at Montreal as a location for terminals. It has been known for some time that the Canadian Northern Railway was looking for a suitable central site, and from time to time reports were spread that they had secured one. To reach the new site on Bleury street it will be necessary for the company to tunnel under the mountain. The cost of the new terminal and the entrance to it will involve the expenditure of $2,000,000 to $3,000,000.

The Canadian Northern Railway has completed surveys for the line by which it will secure its own route from Port Arthur, at which point it will be linked up with the western portion of its system. The projected route of the Canadian Northern will take it through the Algonquin National Park region, along the great clay belt of Ontario, the Temagami Reserve anad thence across the territory north of Lake Superior. It is understood that work will be started this year, and the line will be completed in about three years. The line between Ottawa and Montreal is already under way.

Tenders will be called in June for the construction of the first 120 miles of the Hudson Bay Railway from The Pas. The route of the second half of the line will depend on whether Port Nelson or Fort Churchill is chosen as the terminus. It is altogether likely that the former will be selected, but no definite decision will be announced until the reports of the engineering and hydrographic surveys, now being made, are completed. By next year it is expected that work will be started from the eastern terminus of the line and construction will be vigorously pushed to completion by 1914. Another section of the eastern half of the line will be contracted for this summer. The road will be built under the direct supervision of the Railway Department.

The Canadian Northern Railway has awarded the contracts for the completion of its Toronto-Ottawa line to J. P. Mullarkey, Montreal, Que.; A. Sinclair, Toronto, Ont., and Evan Mackenzie, Toronto. Mr. Sinclair will complete the section between Toronto and Belleville. Mr. Mackenzie will perform the grading and timber work on the 20-mile section between the 180th mile post to the 200th mile post. Mr. Mullarkey will construct the rest of the road between the 164th and the 180th mile posts and between the 200th and the 250th mile posts. He will also do the track laying and ballasting on Mr. Mackenzie's section. Mr. Mullarkey in all will build 66 miles. His portion of the road starts at Sydenham. The contract of Mr. Mullarkey covers the grading, fencing, track laying and ballasting. Work will be put under way on these contracts at once.

A resolution is to be introduced into the House of Commons, by the Minister of Railways, providing for an extension of the terms as specified in the act of last session whereby the government might acquire branch lines in the Maritime Provinces as parts of the Intercolonial system. Under that act it was provided that no branch line could be taken over unless the board of management reported that the road was in good condition, and practically up to the standard of the Intercolonial. It has since then been found by the report of the engineers who examined these roads that very few of them are up to the required standard, and under the conditions of last year's legislation very few, if any, of them could be leased. Under the resolution it is proposed to give the governor in council power to take over some 13 branch lines in New Brunswick and Nova Scotia, aggregating 643 miles.

The appointment of an assistant city engineer at Hamilton, Ont., is under consideration.

Building in Brandon, Man., is reported brisker than it has ever been before at this season of the year. A feature of the situation is the activity in residential work.

Personal Mention

Mr. Wm. McPhail, manager of the Bitulithic & Contracting Company, Limited, has arrived at Regina, where his firm has some good sized paving contracts.

Mr. Fred Stearns, architect, has opened an office in the Bogue Building, Windsor, Ont. He has been commissioned to prepare plans and supervise the rebuilding of the plant of Mr. C. H. Crane, of Detroit. Mr. Stearns is from Detroit.

Messrs. E. & W. S. Maxwell are the architects for a recreation pavilion to be erected in connection with the Hospital for the Insane, at Verdun. Messrs. Quinlan are the contractors.

A. E. Nicholson, of St. Catharines, Ont., was the successful architect for plans for a new 8-roomed school at Welland, Ont. The building will be of red brick, with white terra cotta trim.

Mr. Wm. Cross, C. E., of the Dominion Public Works Department, has left for Edmonton, Alta., where he will report upon the possibilities of the Saskatchewan river. Mr. Cross was formerly superintendent of waterworks at Calgary.

W. C. Baillairge, city engineer of Quebec, accompanied by the mayor and other officials, left that city recently for Boston and New York for the purpose of investigating various street paving. The city has been authorized to spend $400,000 on permanent road improvements.

Commissioner McPherson, of Regina, states that excellent labor conditions prevail in that city and that good men are available for all departments of civic work. Noteworthy improvement is found in the class of imigrants arriving in that city.

At Calgary, recently, Mr. Norman S. Rankin, chief of the publicity department of the Canadian Irrigation and Colonization Company, delivered an interesting lecture on "Home Building in Western Canada" before a meeting of the Overseas Club.

Among those who were in attendance at the First International City Planning Congress at Philadelphia, Pa., were Mr. Richmond Unwin, the well known city planning expert, of London, Eng., and Mr. Thos. H. Mawson, landscape artist, and lecturer in the University of Liverpool. Mr. Unwin, who is known as the author of "Town Planning in Practice," was scheduled to deliver two addresses on city planning at Montreal and Mr. Mawson to address the board of trade and civic guild at a luncheon at the National Club last week.

Mr. Burton Stewart, of the Norton Griffiths Steel Construction Company, has returned to Vancouver after a two months' trip to England. Mr. Stewart was accompanied on his return by the Hon. Francis Grosvenor, who will join the Griffiths Company and establish his residence in Vancouver. Mr. Grosvenor is no stranger in British Columbia. He is a well-known metallurgist, a graduate of the Royal School of Mines, and formerly occupied responsible positions in the laboratory of the Trail smelter and the Hall mines smelter at Nelson. He is a cousin of the Duke of Westminster, one of the richest men in the world.

The city of Victoria, B.C., has engaged Mr. Warren Rodney, formerly of Winnipeg, to supervise the extensive paving work which is to be carried out this season by the Canadian Mineral Rubber Company, of Toronto. The salary is $175 a month. Mr. Rodney is now spending a vacation in Southern California. This position, it will be remembered, was offered Mr. Astley, superintendent of construction for the city of Winnipeg, who declined but recommended Mr. Rodney, who has had long experience on asphalt work in Winnipeg.

Mr. G. W. Volckman, of Ottawa, vice-president and general manager of McArthur, Perks & Company, Limited, left Montreal recently for England, for the purpose of conferring with the president of the company, Sir Robert Perks, concerning their various enterprises on this side of the Atlantic. These include the construction of four concrete docks for the Port of Havana Docks Company (Sir Wm. Van Horne, president) and the extension of the harbor works at Buenos Ayres at an estimated total expenditure of $27,500,000. When Sir Robert Perks was in Montreal some months ago, he said that when he first began work there, the city of Buenos Ayres had but 250,000 people, and now the figure is no less than 1,300,000, and the port is advancing in commercial importance by leaps and bounds. In fact, the first works were hardly completed when ships from all parts of the world were lying three deep at the wharves, hence the decision of the Argentine Government to spend an additional sum of $25,000,000 to make their port equal to the best in the world. The supervision of the work at Buenos Ayres will be undertaken by a partner of Sir Robert Perks. The work awarded to the Canadian firm, according to the details published in our issue of May 3, will amount to about $6,000,000.

The city of Vancouver has decided to appoint an expert to consult with the city engineer, Mr. Fellowes, regarding the proposed sewerage system.

Plans have been prepared and preliminary arrangements completed for the erection of the new C. P. R. hotel at Calgary, Alta. This will ultimately be thirteen storeys high, although at present it is only proposed to complete eight storeys.

The merits of the Engberg electro-hydraulic valve, manufactured by Engberg's Electric and Mechanical Works, St. Joseph, Mich., and for which the John McDougol Caledonian Iron Works Company, Limited, Montreal, are the exclusive agents for Canada, are set forth in an interesting booklet just to hand. The "Engberg" is operated by a hydraulic cylinder, which is supplied by water from either side of the gate and always from the side where the pressure in the highest. The regulating valve consists of a flat valve which is operated by a piston. The piston is moved by releasing the pressure on either side by means of small poppet valves which are raised from their seats by an armature and magnet. No waterworks system having a standpipe or reservoir, can afford to be without this valve, a most valuable adjunct, increasing the effectiveness when fire pressure is desired and permitting a reduction in the cost of maintaining ordinary domestic pressure.

Lethbridge Builders' Exchange

We are indebted to Mr. E. Power, secretary of the Lethbridge Builders' Exchange, for the following particulars concerning the constitution of that body. The Exchange has now been organized about a year and a half and the membership at present is 55. The headquarters are in the Oliver Block on Fifth street, Lethbridge. The Lethbridge Exchange is affiliated with the Alberta Provincial Exchange, which is composed of the Calgary, Edmonton, Lethbridge and Medicine Hat Exchanges, and which works under the jurisdiction of the Canadian National Association of Builders. At the convention of the provincial body in Calgary last February, Mr. J. H. Goode, of Lethbridge, was elected vice-president, and the secretary of the Lethbridge Exchange, Mr. E. Powers, secretary. The 1911 directorate of the Lethbridge Exchange is as follows: President, E. T. Broad; vice-president, H. J. Goode; directors, A. Smith, R. Leader, W. H. Holt, and A. H. Diseth, treasurer, R. Virtue; secretary, E. Power.

Canadian City Engineers

Mr. Dosithe Chene, Hull, Que.

Mr. Dosithe Chene was born at Hull, Que., in 1885. After following a course of study in the local schools he secured a position as draughtsman with a well known firm of architects in Ottawa, Messrs. Burritt & Meredith, with whom he obtained a good practical knowledge of architecture. He matriculated at Laval University, Montreal, in 1905, and was admitted to the Ecole Polytechnique, from which in 1909 he graduated with distinction in civil engineering and chemistry, taking honors in his last three years' study. During the year of his graduation he was employed upon several important undertakings for the Dominion government and in the following year, 1910, he was appointed engineer to the city of Hull. In November of last year he visited Paris for the purpose of studying bacteriology at the Pasteur Institute. In Paris he obtained a certificate as a duly qualified bacteriologist. In the French capital, also, he made extensive observations in the municipal laboratory in connection with sewerage and the purification of water supplies, profiting considerably by the knowledge gained in these departments. During the short time that he has held office at Hull he has already originated a number of improvements in the waterworks system.

City Engineer Chene, of Hull, Que.

At the monthly meeting of the Edmonton board of trade, the report of the civic planning committee was presented by Mr. C. Lionel Gibbs. Among the committee's recommendations were the regulation of secondary street plans, the establishment of a civic square for the erection of public buildings and the partial control of private property development. The report was adopted by the board of trade and the committee will continue its work of mapping out a definite plan of civic improvements.

At the annual meeting of the Cement Products Exhibition Company, held recently in Chicago, Mr. E. M. Hagar, president of the Universal Portland Cement Company, was elected president; Mr. Norman D. Fraser, president of the Chicago Portland Cement Company, vice-president; and Mr. J. McDaniel, sales manager of the Chicago Portland Cement Company, secretary-treasurer. The year's transactions showed a surplus of about $3,000 after the settlement of all accounts in connection with the New York and Chicago cement shows. A general feeling of satisfaction was expressed and it was felt that the benefits of the shows to the cement industry were such that they should be continued upon the same basis as in the past.

Trade Notes and Items of Interest

Mr. L. O. David, city clerk, and Mr. Wm. Robb, city treasurer, of Montreal, will retire at the end of the present year.

The Dominion and European Inspection Company have opened new head offices at 318 Lagauchetiere street, Montreal.

Professor Orton, of Ohio University, has submitted to the Edmonton board of trade a comprehensive report upon the clay resources of Alberta.

At the annual meeting of the Civic Improvement Society of Sherbrooke, Que., Mr. F. S. Morey was elected president and J. H. Brice, secretary.

The Sooke Lake survey, which resulted in such a mix-up at Victoria, B. C., is now completed and Mr. C. H. Topp, the ex-city engineer, has submitted a bill for $3,100.

Dr. Todd, the well known landscape architect, left Montreal recently for Victoria, B.C., where he will make a report on the laying out of certain districts in that section.

A party of Boston business men, members of the Massachusetts Real Estate Exchange, will arrive in Montreal on June 6th to look over the harbour improvements in that city.

Plans for the new C. N. R. station at Regina have been received at the C. P. R. offices in that city. The building will be 316 by 63 feet, three storeys high, with one-storey wings on each side.

According to an announcement made recently in England by Mr. Chas. M. Hays, the time is not far distant when the G. T. P. will establish a steamship service across the Pacific ocean from their western terminus at Prince Rupert.

Among the representatives of the city of Toronto who attended the City Planning Convention in Philadelphia were City Engineer Rust, and Messrs. J. C. Hynes and W. B. Armstrong, of the Guild of Civic Art.

Mr. Wm. Jno. Cooke, a well known contractor, of Montreal, Que., died last week in that city. The late Mr. Cooke, who was 75 years of ago, had been engaged for nearly 50 years in the Montreal contracting field.

The city of Hamilton, Ont., will engage an expert consulting engineer to report on its water supply. Messrs. Jno. Kennedy. of Montreal, Willis Chipman, Toronto, and E. H. Keating, Toronto, have been invited to submit terms.

Sir Thos. Shaughnessy, president of the C. P. R., has authorized the preparation of plans for an addition to the Empress Hotel at Victoria, B.C. The estimated cost of the work is nearly $200,000.

The Trades and Labor council of St. John, N. B., intends to ask the provincial government and the city authorities to have the fair wage clause inserted in all contracts given out by them.

The Canadian Pacific Railway has received from the Austrian State railways a contract for the suppry of a number of observation cars for use on the Austrian State lines. The cars will be shipped direct to Austria by way of Trieste.

The Canadian Northern is planning an expenditure of no less than $30,000,000 for the establishment of terminals at Montreal. Negotiations are now in progress between the Mackenzie-Mann interests and Hon. G. P. Graham, Minister of Railways.

Among recent incorporations at Ottawa is that of the Western Canal Company, which proposes to construct a canal from a point on Rainy Lake, just east of Fort Frances, to a point five miles west of the foot of the Long Sault Rapids on the Rainy River. The capital is $2,000,000.

The St. James Hotel at the corner of St. James and Cathedral streets, Montreal, one of the best known hostelries in the city, is to be demolished to make way for the terminals which the G. T. R. propose to erect at Bonaventure station.

Renewed activity is reported in the building trades at Halifax, N.S., and the outlook is stated to be exceedingly bright just now. The season has not been remarkable for any large contracts, so far, but several big undertakings are on the tapis. Generally, 1911 is expected to be a record year for the city.

The city of Lethbridge, Alta., is looking for a city engineer. The qualifications desired are experience in paving and sewer construction and railroad work. It is reported that the city is prepared to pay from $5,000 to $6,000 to the right man. City Engineer Jones, of Brantford, has been invited to send in an application.

Messrs. T. Aird Murray, Willis Chipman and J. G. Sing, of Toronto, and Mr. I. Randolph, of Chicago, the experts engaged recently by the city of Toronto to report upon the water supply, have prepared plans for a second intake pipe, which will be of steel, six feet in diameter, encased in concrete, and reinforced by metal. It will be about 3,200 feet in length.

According to Mr. W. G. Brownlee, manager of transportation for the G. T. R., who was in Toronto last week, several million dollars will be expended by the G. T. R. in the province of Ontario this year. One of the items on the list is the construction of a roundhouse at Midland. The operations of the company, Mr. Brownlee said, were being retarded greatly by the scarcity of labor.

At Winnipeg, Man., many structural iron workers are still on strike. They are asking for 50 cents an hour for a nine-hour day and they also want closed shop. The Dominion Bridge Company is willing to agree to the new scale, but insists upon an open shop. The Hamilton Bridge Company and the Canada Foundry Company will agree neither to the scale nor the question of closed shop.

The city of Vancouver was inundated recently with a rush of railway contractors from the other side of the border anxious to bid on the C. N. R. construction work between Hope and Kamloops. The contractors, according to the information to hand, were "accompanied by their respective adherents consisting of sub-contractors and shift bosses, scores of whom are stopping at the downtown hotels eagerly awaiting the award."

Between five and six tons of asphalt will be shipped into Edmonton from the north country before July, 1910, according to A. Voilette, manager of the Ft. McKay Oil and Asphalt Company. The asphalt is being shipped into Edmonton for the purpose of making a test of its qualities for pavement purposes on one of the city streets. Some weeks ago the city council accepted the offer of J. K. Cornwall, M.P.P., and Mr. Voilette, to pave a portion of one of the city's streets at the company's expense this season.

W. G. Gillett, a well known contractor, and proprietor of the marble quarries at Kaslo, B.C., hopes soon to be shipping to Vancouver and other large coast cities. Mr. Gillett has the contract for the marble for the facings of the court house at Grand Forks, B.C., for which over 200 tons will be required. There should be a good market for the Kaslo product seeing that the only marble quarries at the coast are on Vancouver Island and that these are closed down at present.

In a fire which occurred at the Montreal city waterworks, the plans for the enlargement of the aqueduct and the filtration plant were damaged by water and smoke and narrowly espaced total destruction. The damage to the building is estimated at $3,000 and to the stock between $5,000 and $6,000. Some of the materials and instruments belonging to the draughtsman were also damaged. The city has an insurance fund amounting to over $60,000, which, of course, will amply cover the loss.

A strike of two hundred structural steel workers on G. T. P. bridge construction is reported from Calgary, Alta. If the strike continues it will hamper the building operations of the G. T. P. and the Canadian Northern, there being many large bridges in course of construction along these lines. The sheet metal workers of Calgary have threatened the Builders' Exchange with a strike unless it concedes an advance of 7½ cents an hour before June 1. The carpenters are stated to have signed up an agreement for a minimum scale of 50 cents.

A shortage of cement is reported from Regina and Edmonton. In the former city a number of contractors are tied up owing to their inability to secure this material. At Regina the situation is said to be quite serious, the city being unable to secure supplies of cement required in the street railway construction, and the builders, also, are being handicapped in their operations. According to enquiries, other western cities are also badly in need of cement. Orders have been placed for large quantities, but there are indications of an uncomfortable delay.

According to a recent dispatch from Edmonton, Alta., building operations in that city have been held up for the last week owing to a shortage of supplies. Complaint is made in the city concerning the inadequate number of commission houses in the city. There is said to be far too much subletting and that Edmonton contractors are compelled to do business through agencies in Calgary, with the inevitable result that they get left. No improvement is looked for, it is stated, until supply houses are induced to locate in Edmonton, thus making the city independent of the Calgary agencies.

Good progress is being made on the construction of the C. P. R. high level bridge between Edmonton and Strathcona. A dispatch from Edmonton, dated May 15th, records the completion of the North river pier. The contractors are now busy on the south pier, which has already been built up to a height of about 30 feet above the water level. Excavations are being made for the pedestals that will support the steel bents of the bridge, and the concrete piles are being driven. All the steel work on the structure will be erected from the Strathcona end.

The Sterling Blower Company, of Hartford, Conn., have favored us with a copy of their catologue, No. 114, devoted to Sterling slow speed, low power exhausters. These exhausters represent many years' experience in the successful installation of exhaust systems and are designed to meet the most exacting requirements. The Sterling Blower Company claim that in comparative tests with other machines, theirs have shown a higher efficiency, ranging from 10 to 25 per cent. Full particulars will be furnished on request.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brandon, Man.
The report of the committee on paving recommending asphalt blocks was [illegible] in the council.

The city council adopted the report of the special committee recommending the adoption of asphalt blocks for street pavement.

Biggar, Sask.
Tenders are called until June 13th for trenching, etc., supply c. i. water mains, etc., hydrants, pump machinery, compressed air storage tank, erection of power house; construction of concrete reservoir. F. McArthur, consulting engineer, Yorkton, Sask. Advertisement in "Tenders and For Sale Department" of this issue.

Cardston, Alta.
The citizens here are considering seriously the installation of a gravity waterworks system.

Calgary, Alta.
New tenders for asphalt paving will be called.

The city engineer's staff is getting out estimates for grading to the extent of about $18,600, paving, $232,117.56, concrete sidewalks, $60,000.

Tenders are called until June 13th for construction of 6-ft. diameter concrete trunk sewer about 12,000 ft. long for the city of Calgary, W. D. Spence, city clerk. Advertisement in "Tenders and For Sale Department" ot this issue.

Carmangay, Alta.
Carmangay is arranging to have estimates for the cost of a plant to supply the town with water and electric lights, both systems can probably be installed for less than $20,000. It is proposed to erect a pumping station on the bank of the river near where the present electric light plant stands.

Cranbrook, B.C.
A by-law to install a sewer system in Cranbrook carried yesterday 155 to 77, fourteen more than the three-fifths necessary. J. Haddin, C.E., of the John Galt Engineering Co., Winnipeg, prepared plans.

Estevan, Sask.
Tenders addressed to L. A. Duncan, secretary-treasurer, will be received until June 6th for laying tbout 2,000 feet of water mains; laying about 2,500 feet of sewer; constructing about 85,000 sq. ft. concrete walks. Chipman & Power, engineers, Toronto and Winnipeg.

Edmonton, Alta.
Tenders for 10-ft. trunk sewer are as follows:

W. Manders, $201,068, $172,004.20; per ft., $53.89, $45.62.

Rigby, Hyland & Plymer, $255,081, $250,310.50; per ft., $73.90, $72.45.

Breckenridge, Galt, Eng., Co., and Davison & Westaway, $318,111, $267,938.80; per. ft., $87.60, $72.35.

Connell W., $224,144, $251,056; per. ft., $62.90, $61.08.

Prairie construction Co., $275,811; per ft., $76.04.

W. Manders, $179,816, $171,259.46; per ft., $50.36, $47.82.

Fairville, N.B.
Tenders addressed to J. King Kelley, county secretary, 108 Prince William street, St. John, will be received until June 6th for construction of sewerage system for Fairville. Engineer, G. C. Murdoch, 74 Carmarthen street, St. John. None of the tenders received before quoted on masonry work.

Fotr William, Ont.
Tenders are called until June 1st for clearing and grading certain streets. City Engineer, John Wilson.

Goderich, Ont.
Tenders are called until June 10th for furnishing and laying of about 12,800 lin. ft. of storm sewers, building manholes, catch basins, etc. N. G. Cameron, mayor; L. L. Knox, town clerk. Advertisement in "Tenders and For Sale Department" of this issue.

Humboldt, Sask.
Tenders addressed to Robt. Telfer, chairman board of works, will be received until June 3rd for construction of 21,000 sq. feet of cement sidewalks, contractor to furnish material, do filling and excavation, etc.

Lancaster, N. B.
The provincial board of health endorsed the application of this municipality for a sewerage system; also that of Moncton for extension of sewerage system.

London, Ont.
Tenders addressed to chairman and members of No. 2 committee will be received until June 1st for construction of sewers on Elias street and others. Plans, etc., with Geo. W. Wright, city engineer.

Moose Jaw, Sask.
Tenders are called until June 19th for sewer and water extensions, laying and supply of pipe. J. M. Wilson, city engineer; W. F. Heal, city clerk. Advertisement in "Tenders and For Sale Department" of this issue.

Montreal, Que.
Tenders addressed to the board of commissioners will be received until June 2nd for construction of asphalt, cement concrete sidewalks during the season. L. N. Senecal, secretary.

Tenders addressed to the board of commissioners, city hall, will be received until June 8th for supply and delivery of about 7,000 tons of c. i. pipe. L. N. Senecal, secretary.

North Bay, Ont.
Tenders are called until June 17th for construction of about 100,000 sq. feet of concrete sidewalks and crossing. T. N. Colgan, commissioner. Advertisement in "Tenders and For Sale Department" of this issue.

Ottawa, Ont.
Tenders addressed to N. J. Ker, city engineer, will be received until June 1st for construction of asphalt pavement on Somerset street and King Edward avenue.

Regina, Sask.
Considerable paving is being planned for this year to be completed this fall. City Commissioner McPherson is preparing a report.

Southampton, Ont.
The by-law to expend $7,500 to extend the water-works system here was carried.

Sydney, N.B.
Tenders will probably be called for the large amount of paving contemplated after the next council meeting on June 1st.

South Vancouver, B. C.
One thousand feet of one-inch pipe at $6.20 per hundred feet, and two Mueller tamping machines and pressure record guages were ordered for the waterworks department.

Stettler, Alta.
A petition asking for the installation of a sewerage system, was recently submitted to the municipol council. Engineer's plans and specifications and an estimate of cost will be obtained.

Sheho, Sask.
Tenders addressed to the secretary-treasurer will be received until June 15th for construction of about 5,000 sq. feet of concrete sidewalk. Specifications at the office of the above or at the office of the consulting engineer, F. McArthur, Yorkton.

Sudbury, Ont.
Mr. Willis Chipman, C.E., Toronto, estimates the cost of extending the sewerage system, so as to intercept and prevent all pollution of Ramsay Lake, at $47,000. In the meantime the matter has matter has to go the Provincial Board of Health for its sanction.

Saskatoon, Sask.
The installation of the mechanical water filtration plant will be installed by the Roberts Filter Manufacturing Company, Philadelphia, $55,890; others

tendered as follows: Bell Filtration Co. of Canada, Toronto, $56,950; Pittsburgh Filter Mfg. Co., Pittsburgh, Pa., $58,120; New York Continental Jewell Filtration Co., New York, $56,845; Geo. H. Archibald & Co., Winnipeg; Laurie & Lamb, Montreal, $50,575. Geo. T. Clark, city engineer.

Thorold, Ont.

The council instructed the town clerk to communicate with Mr. Chipman in regard to his supervision of the proposed sewers.

Toronto, Ont.

Tenders addressed to the chairman, board of control, will be received until June 6th for construction of asphalt pavement; asphalt block pavements, bitulithic pavements; gradings; concrete curbs; concrete walks; sewers.

Three tenders were received for the work of completing the repairs of the present intake, all on a percentage basis. Mr. Thos. Davies, if allowed to use the city plant, would do the work at cost, plus 12½ per cent. Miller, Cummings, and Robertson, who would use their own plant, want cost and 20 per cent; while Capt. Leslie would rent the city plant, do the work at cost and 15 per cent. Referred to the city engineer for report.

The following tendered on intake pipe:

	Pipe per ft.	Joints. etc.
Marine Signal Co.	$21.00	$2,685
Drummond McCall Co...	20.00	4,750
Polson Iron Works	19.45	3,822
John Inglis Co.	18.80	3,875
Canada Foundry Co......	17.75	3,643

Drummond McCall & Co., of Montreal, did not tender for rivetted steel, but for lapwelded pipes which would be laid down here in lengths running about six pipes to 155 feet 9 inches. The International Signal Co., of Ottawa, submitted the lowest tender for joints and intake branch. The details of the Canada Foundry Company's tender, which was recommended for acceptance, were as follows: 72-in. pipe, per foot, $17.75; expansion joints, $475; intake branch, $1,750; flexible joints, $1,418. Its price for quick delivery was as follows: 72-in. pipe, per foot, $20.75; joints, etc., $4,300.

Victoria, B. C.

The $300,000 by-law for extensions to sewer system was carried.

Wilmer, B. C.

A waterworks company for this village is being organized.

Wilkie, Sask.

This municipality have under consideration the installation of a complete waterworks system.

Welland, Ont.

Tenders are called until June 10th for pumping house, foundations, etc. R. Cooper, chairman water commissioners; Wm. Kennedy, designing engineer, Montreal. Advertisement in "Tenders and For Sale Department" of this issue.

The following figures on cost of various pavements were submitted by town Engineer Black:

Creosoted wood block, sq. yd., $3.61 to $93.86.

Bitulithic, $2.30 to $2.70.

Sheet asphalt, $2.50 to $3.65.

Vitrified brick $3.50 to $4.65. Mr. Cooper informed the meeting that he could have this put down at $2.32 to $2.48.

Asphalt block, $2.50.

These figures include grading and concrete base.

Herbert J. Bowman, C. E., has reported on a proposed system of better roads throughout Welland county. He recommends one hundred and thirty-four miles of roads at a cost of three hundred and seventy-five thousand dollars. A by-law will be submitted at the June session of the county council.

Winnipeg, Man.

Tenders addressed to the chairman, board of control, will be received until June 2nd for supply of labor and materials required in erection of Pump House at Well No. 8. Plans, etc., at office of the city engineer. M. Peterson, secretary.

In the discussion on paving of the proposed highway south of the Assiniboine and the Portage avenue road as far west as Headingly, a distance of nine miles, the following information was brought out: As to the cost, one tender has been received to lay a pavement with Westrumite, 24 feet wide with a concrete base. With cement curb and gutter this would cost $29,500 a mile and other incidentals would bring up the cost to $30,000. Another offer, although not official, is for Rocmac, which would cost $15,000 a mile.

There will be a meeting of the council as soon as the intention of the government is found out and investigations into the cost made. A by-law will be submitted, tenders called for and the contract awarded in the shortest possible time. Frank Ness, secretary-treasurer., Mun. of Assiniboia.

AWARDED

Harriston, Ont.

The contracts for waterworks here were awarded as follows: Gartshore-Thomson, P. & F. Co., Hamilton, for cast iron pipe; Kerr Engine Co., Walkerville, for hydrants and valves; Hunter Bridge & Boiler Co., Kincardine, for water power; Jas. Robertson Co., Toronto, for lead; Geo. B. Moogk, Weston, for excavation and pipe laying; Bowman & Connor, engineers, Toronto and Berlin.

Moncton, N. B.

The following tenders for supply of water pipe were awarded:

Sumner Company's tender for Londonderry pipe for the twenty-inch main amounting to $58,447.50, was accepted. The same firm's tender for valves at a cost of $1,612.38 was also accepted. The city engineer was instructed to proceed with the construction of the foundation for the dam and tenders for clearing the pipe line are to be called at once.

Port Hope, Ont.

The tenders for the construction of the cement sidewalks were received as follows:

W. G. Gibson, 9c.

W. J. Arithistle, London, 9c.

[illegible] & [illegible], [illegible], 9¼c.

Tartlithic Paving & Construction Co., Chatham, 9½c.

Campbell & [illegible], [illegible]

L. E. Hall, Port Hope, 10⅛c.

Curran & [illegible], Orillia, 10[illegible]

Concrete Construction Co., Guelph, 10 9/10c.

Maple Leaf Artificial Stone Paving Co., Simcoe, 11c.

W. B. Robinson, Brighton, 12c.

W. G. Gibson was given the contract.

South Vancouver, B. C.

Messrs. Shacht & Company were awarded the contract for grading from King Edward to Fifty-first avenue at $19,734, work to be completed in nine weeks from May 29.

La Place Brothers' Construction Company were succesful in their tender of $9737 for grading Main street from Thirty-fourth to Fifty-first avenues. The work is to be done in ten weeks. The same time limit is imposed upon D. Philpott, who was given the contract for grading Westminster road from Knight to Beatrice street for $6115. The concract for concrete sidewalk and granite curbing on Commercial street was awarded to Hall and Boyer at 68 cents for lineal foot for the concrete and $1.5 for the granite.

South Vancouver, B. C.

The contract for the supply of hydrants to the municipality was let to the Terminal City Iron Works.

Strathcona, Alta.

Manley Construction Co. were awarded the following: excavations for the east end trunk sewer and laterals, for $29,763.08, an additional price of $3.50 per cubic yard to be paid for any sandstone or bedrock having to be removed; extensions to present water and sewer lines, $12,085.48. This last tender was over $2,000 less than the next lowest. For the east end sewer lines the tenders were as follows: A. Mills, Strathcona, $45,859.92, Hulbert and Wilson, Strathcona, $40,403.45; Manley Construction Co., Edmonton, $29,763.08.

Figures for the extensions to present lines were: A. Mills, $18,705.92, divided as follows: For sewer lines, $11,167.27; for water mains, $7,538.65. Hulbert and Wilson, $18,385.85, divided, sewer lines, $10,847.20 and water mains, $7,538.65. D. Alton and W. Gray, $14,398.96, divided, sewer lines, $8,741.32, water mains, $5,657.64. This firm attached a price of 40c. per foot in depth for excavation of manholes. The Manley Construction Co., quoted $12,085.48 for the total work, divided, sewer lines, $6,269.95, water mains, $5,815.53.

Toronto, Ont.

The contract for repairing the broken intake pipe was awarded to Messrs. Miller, Cumming & Robertson.

The Canada Foundry Company was awarded the contract for the supply of six-foot rivetted steel pipe for the proposed new intake at $20.75 per lineal foot.

Railroads, Bridges and Wharves

Avonport, N. S.

The Dominion Atlantic Railway is starting the erection of a steel bridge over the Gaspereau river between Avonport and Horton Landing, N. S., It is supposed that the C. P. R. is directing the operations and is to take over the D. A. R. in a few weeks, but no information can be obtained here.

Ayr, Ont.

Tenders addressed to [illegible], Ayr, will be received until June 5th for

Construction of substructure of reinforced concrete bridge in Tp of North Dumfries. Plans, etc., at office of the above. Engineer in charge, E. O. Fuce, Galt.

Calgary, Alta.

Tenders addressed to S. E. Beveridge, Young Block, Bow River Bridge Company, Ltd., P.O. Box 1650, Calgary, will be received until July 1st for the three 100-foot span steel traffic bridge, with timber approaches.

Fort William, Ont.

Tenders are called until June 30th for construction and supply of materials in connection with reinforced concrete subway. John Wilson, city engineer. Advertisement in "Tenders and For Sale Department" of this issue.

Kingston, Ont.

The council will purchase Cataraqui bridge in order that negotiations may be opened with the Dominion Government for the erection of a new one.

Montreal, Que.

It is announced that the C. N. R. will at once ask for tenders for the construction of the section of their main line around the north shore of Lake Superior, extending from Stillwood, a point forty miles west of Sudbury, to Port Arthur, a distance of about 550 miles.

St. John, N. B.

It is stated that the public works department, Ottawa, will call for tenders within a few days for very extensive harbor works, totalling about $5,000,000.

The Department of Public Works will call for tenders for extensive improvements in the harbor at St. John, N. B. The plans include a dry dock and a shipbuilding plant, and the construction of berths for three G. T. R. steamers. The Department likewise purposes to ask for tenders for the construction of additional wharf accommodation at Champlain market, Quebec, to be used in connection with the G. T. P. System.

Saskatoon, Sask.

Tenders are called until June 15th for construction of substructure for 19th street subway. Advertisement in "Tenders and For Sale Department" of this issue.

AWARDED

Dauphin, Man.

Contract for the steel superstructure for Wakefield and Burrows Avenue Bridges, file 1-8, was awarded to Farrelly Brothers, of McCreary, Manitoba, $4,791 for the two spans. The other tenders were as follows: Dominion Steel Bridge Co., Winnipeg, $4,294 for material only; Dickson Bridge Works Co., Campbellford, Ont., $4,815, material and labor; Algoma Steel Bridge Co., Winnipeg, one tender, $5,275, material and labor; Algoma Steel Bridge Co., Winnipeg, one tender, $4,975, material and labor. J. W. Johnston, secretary-treasurer.

Quebec, Que.

The following sub-contracts have been let by Messrs. O'Brien & Doheny, head contractors for the 56 miles of the Quebec & Saguenay Railway now under construction, to the following:

Messrs. O'Brien & Martin, Messrs. Ryan & McDonald, Messrs. Doheny & Thomson, Mr. D. R. McDonald, Mr. F. C. Jackson, Messrs. Gagnon & Massiocotte, Mr. Jas. McDonald, Mr. J. O. Neill, Messrs. Mitchell & Sutherland, Messrs. Irvine & Morrison, Mr. J. H. Stewart.

Public Buildings, Churches, Schools, etc.

Ayton, Ont.

W. A. Mahoney, architect, Guelph, is preparing plans and specifications for school here.

Amherstburg, Ont.

This municipality has decided to have a Carnegie Library. A site has been purchased.

Belleville, Ont.

The council granted the $35,000 asked by the board of education for the new school.

Brandon, Man.

The school board have secured a full block just east of the Normal School site on which it is the intention to build a new collegiate in the near future.

Building permit was recently issued to Provincial Government Asylum for building of brick, $532,878.

Brownsville, Ont.

Tenders are called until June 10th for erection of public school here. J. W. Hopkins, secretary P. S. board; Taylor & Taylor, architects, Hope Chambers, Brantford. Advertisement in "Tenders and For Sale Department" of this issue.

Cainsville, Ont.

The Baptists have organized with the intention of building a church in the near future. Rev. C. H. Emerson is the pastor.

Camrose, Alta.

Tenders will soon be called for carpentry and plumbing for the Scandinavian College for Alberta. It is expected that the college will be open by October 18th.

Chatham, Ont.

At a recent meeting of the board of education it was decided to advertise for plans for the new school to be submitted on or before June 15th. The advertisement will call for tenders for an 8-room building, to be increased to 12 rooms when desired. Estimated cost, $20,000.

The council voted the board of education $32,000 towards the erection of a new 8-room public school.

Cranbrook, B.C.

Tenders addressed to R. C. Desrochers, secretary, department of public works, Ottawa, will be received until June 12th for construction of public building here. Plans, etc., obtained at offices of Mr. Wm. Henderson, resident architect, Victoria, B.C., at the post office, Cranbrook, and at this department.

Calgary, Alta.

Building permit was issued to Wesley Methodist Congregation for church here, brick and stone, $50,000. J. B. Gunn & Co., contractors.

Messrs. Lawson & Fordyce, architects for the First Presbyterian Church have secured the services of Messrs. Allen & Collins of New York, specialists in building of that kind. Mr. Collins is expected to be in Calgary shortly to meet the board. Estimated cost of the building, $130,000.

Durham, Ont.

W. A. Mahoney, architect, Guelph, is preparing plans for remodelling the Methodist Church here.

Durham Centre, N. B.

Tenders addressed to I. McNair, sec.-treas., building committee, will be received until June 8th for erection of spire to the Presbyterian church, River Louison.

Edmonton, Alta.

Preparations of plans for new Masonic Temple were authorized at a meeting of the shareholders recently. Estimated cost of structure, $150,000. President, W. G. Ibbitson; secretary-treasurer, C. E. McManus.

Fort William, Ont.

Tenders were called until May 29th for erection of 4-room school on McIntosh street. Hood & Scott, architects, Murray building.

Fergus, Ont.

A meeting has been called for June 1st of representatives of the councils of Peel, West Garafraza, Eramosa, Nichol, Elora and Fergus, to consider the advisability of establishing a joint isolation hospital for the municipalities named.

Glace Bay, N.S.

The Infectious Disease Hospital at Glace Bay was totally destroyed by fire on the 24th inst. Loss about $6,000.

Guelph, Ont.

W. A. Mahoney, architect, Guelph, is calling for tenders for jailer's residence here.

Tenders are called until June 6th for erection of jail and jailer's residence here. W. A. Mahoney, architect; T. J. Moore, city clerk. Advertisement in "Tenders and For Sale Department" of this issue.

Humboldt, Sask.

This municipality will have a $25,000 hospital.

Hardieville, Alta.

Plans for a new 2-room school from local architects are called until June 5th.

Hamilton, Ont.

A site with 125 feet frontage on Barton street east has been purchased for a club house for the Daughters of the Empire. Mrs. Crerar, Mrs. Sutherland and Mrs. Nesbitt are interested.

Ingersoll, Ont.

Tenders addressed to R. C. Desrochers, secretary, Department of Public Works, will be received until June 5th for interior post office fittings.

Kingston, Ont.

Tenders on the proposed new building, post office, new R. M. C. dormitories and new school are all held up pending the settlement of the labor troubles.

Lethbridge, Alta.

Tenders are called until June 30th for erection of Catholic church here. Plans etc. at office of E. Power, 324 6th street south.

Montreal, Que.

Tenders addressed to the board of commissioners, will be received until June 8th for construction of bath in St. Ann's Ward. Plans, etc., may be obtained from Mr. A. Piche, architect, No. 52 Victoria Square, Montreal.

Moose Jaw, Sask.

The Y. W. C. A. have commenced a $50,000 building campaign.

Napanee, Ont.

Tenders addressed to the secretary, board of education, will be received until June 12th for heating, ventilating and plumbing of Central Public School, etc.

Netherhill, Sask.

Tenders addressed to R. A. Scott, sec.-treas., S. D., No. 2,659, will be received until June 12th for construction of brick school house. Specifications obtained from above.

Nelson, B. C.

Tenders addressed to the Director of Contracts, Department of Militia and Defence, Ottawa, will be received until June 15th for construction of rifle range here. Plans, etc., obtained at the office of the District Officer Commanding Military District No. 11, Victoria, B.C., the Director of Engineer Services, Headquarters, Ottawa, and the Officer Commanding 102nd Regiment, Nelson, B.C.

Orillia, Ont.

The plans for the proposed boathouse and pavilion in Couchiching Beach Park, prepared by Mr. W. H. Croker, were approved, and the chairman of the Parks Committee was authorized to call for tenders.

Ottawa, Ont.

A. Le B. Weeks, architect, is calling for tenders for the new Congregational church.

The Roman Catholic Church convent and presbytery at St. Cecil de Masham, seven miles from Wakefield, was destroyed by lighting. Estimated total loss, $57,000.

Port Arthur, Ont.

Excavation has commenced on the new Government fish hatchery. N. McDougall is in charge. The building will be of concrete and frame

Pembroke, Ont.

The plans for the Carnegie public library are being submitted for approval to Mr. Carnegie. Secretary Library Board, Mr. John Reeves, Pembroke; architect, F. C. Sullivan, Ottawa. Estimated cost, $15,000.

Peterborough, Ont.

Tenders are called until June 5th for completing the 3rd storey of the King Edward school; for completing the present system of steam heating in same; for supplying a new system of steam heating and plumbing for the building to be used as a collegiate institute. G. H. Thompson, secretary, board of education

Regina, Sask.

A Jewish synagogue will be erected here shortly, a site having been secured. Mr. Abramson, Montreal Fur Works, is interested.

Tenders are being called for addition to Albert school. Storey & Van Egmond, architects.

Richmond, B.C.

This municipality is considering the question of erecting a new municipal hall, for which a site at Brighouse is proposed.

Saskatoon, Sask.

At a special meeting of the building committee of Christ Church congregation, it was decided to adopt the plans for the proposed church drawn in 1906 by Chas. E. Cordery. A campaign to raise $120,000 has been started. Messrs. Thompson, Daniel and Colthurst have been appointed architects.

Tenders were called until May 22nd for erection of the addition to Machinery hall; dining hall; poultry house at the exhibition grounds. A. Leslie, city clerk.

Tenders were called until May 27th for erection of St. Thomas Presbyterian church. Architects, Storey & Van Egmond.

Tenders addressed to W. P. Bate, secretary, Box 1106, will be received until June 3rd for erection and installation of plumbing, heating and ventilation of the new Alexandra and Victoria schools. Plans, etc., at office of architect and at the Builders' Exchange, Winnipeg. David Webster, architect, Room 4 Kempthorne Block, Saskatoon.

Tenders addressed to John Spicer, secretary building committee, 21st street, Saskatoon, will be received until June 3rd for erection of new Third Avenue Methodist Church. Plans, etc., at offices of the above. J. N. Semmens, architect, 903 McArthur Building.

Tenders addressed to W. P. Bate, secretary, were received until May 25th for erection, exclusive of plumbing, heating and ventilation, of school here. David Webster, architect, No. 4, Kempthorn Block.

Sherbrooke, Que.

The Roman Catholic Commissioners have purchased 14 lots in Bellevue Park, on which it is understood that a new school will be erected at once.

St. John, N. B.

Tenders addressed to F. Neil Brodie, architect, will be received until June 7th for mason work, carpentry, heating and plumbing and glazing in connection with the work of remodelling the contagious diseases hospital. Plans, etc., at office of above.

The city engineer and T. M. Burns, secretary, board of health, were appointed to report on an incinerator plant.

Saltcoats, Sask.

Tenders will be received until June 20th for $15,000 debentures, issued for town hall and fire apparatus. [illegible] Boake, secretary-treasurer.

St. Thomas, Ont.

Architect John R. Findley is preparing plans for a new schoolhouse for school section No. 11, Aldborough.

Tenders for the painting of the Collegiate Institute, Manitoba and Myrtle schools are called until June 5th. J. T. Finlay, architect. A. MacPherson, chairman building committee.

Stellarton, N. S.

A committee has been appointed to select a site for the new post office for which $4,000 has been voted.

Sydney Mines, N.S.

Tenders addressed to C. F. McKinnon, P. P., will be received until June 8th for erection of an addition to Convent school here.

Souris, Man.

The school by-law was carried. Estimated expenditure, $35,000. Architect, Thos. Sinclair, Brandon.

Strathcona, Alta.

The library board have accepted the offer of Mr. Carnegie of $15,000 for erection of library here.

Trail, B.C.

The by-law to raise $25,000 for erection of new school here was carried.

Swan Lake, Man.

The by-law to raise $8,000 for consolidated school purposes has been carried.

Toronto, Ont.

Tenders are called until June 8th by Public Works Department for the plumbing, heating and electric wiring required at No. 5 Queen's Park. Plans, etc., at above department. Advertisement in "Tenders and For Sale Department of this issue.

Tenders addressed to J. Cadaret, chairman sites and building committee, will be received until May 31 by the separate school board, 24 Duke street, for trades in connection with midsummer repairs to the separate schools. Specifications at office of the architect, C. J. Read, Confederation Life Building.

Vancouver, B.C.

Mr. J. M. McLuckie has a permit for a seven-storey business block on Pender street. The building will have a frontage of 52 feet, the estimated cost being $70,000.

The by-law for $156,000 to be spent on additional school expenses was carried; also that to expend $30,000 for alteration of market building.

A new girls' school to be known as St. Margaret's will be erected on the corner of Belmont avenue and Fort street. Miss M. Barton, principal.

F. M. Rattenbury, provincial architect, is preparing plans for the new library block.

Winnipeg, Man.

Tenders addressed to M. Peterson, secretary, board of control, will be received until June 16th for supply of labor and materials required in the erection of an incinerator in Ward 7. Plans, etc., at office of city engineer.

The congregation of St. Matthew's church have [illegible] to purchase a site for their church on corner of Maryland and Livinia avenue

Tenders are being called for erection of [illegible] storey and basement, [illegible] fireproof brick [illegible] reinforced concrete. Estimated cost, $70,000. P. C. Samwell, architect

Tenders were called until May 29th for erection of addition [illegible]

Home. Plans etc. at office of Mr. J. D. Atchison, architect, Bank of Toronto Building. J. M. Cosgrave, business manager.

The board of control decided to submit a by-law at the next election asking for authorization for the building of a city hall annex on the site of the present market building, the said annex to ultimately form part of the complete new city hall. The competitive plans which will be called for will be for the whole new city hall, including the annex, but only the annex would be erected next year, the idea being to build the main hall a few years later. The total cost of the new buildings is variously estimated at from $1,000,000 to $2,000,000, of which the annex would cost probably half a million.

Weyburn, Sask.

Plans have been prepared for the new school. They show a building 70 ft. long and 80 ft. deep, steam heating and probably mechanical ventilation. Estimated cost, $20,000. F. Rooney, is interested.

Wynyard, Sask.

Plans of the proposed new school house submitted by W. W. LaChance, Saskatoon, have been approved and instruction given to proceed with construction. Estimated cost, $15,000.

AWARDED

Kamloops, B. C.

Robert Mackay has been awarded the contract to erect the new hospital, $100,000.

Montreal, Que.

Messrs. Seguin & Guindon, 928 St. Catherine East, have been awarded the contract for the postal station "C," corner St. Catherine and Plessis streets. Mr. Joseph Perrault, architect, 2106 Park avenue, $94,000.

Ottawa, Ont.

The public school board has awarded the contract for metal ceilings at Glashan school to McFarlane and Douglas for $300, the lowest tender. The other tenders were Dunning's Sheet Metal Works, $500, McKinley and Northwood, $608. In the addition to the Mutchmor Street school, T. C. James was awarded the contract for the masonry, brick and concrete work for $28,500. The other tenders were, G. A. Grain, $32,000 and A. Garvock, $32,453. Taylor and Lackey were awarded the contract for the carpenter work for $9,990. The other tenders were A. G. Marshall, $10,220, J. and C. Low, $10,600, Alex. Christie, $11-826, T. A. Shore, $13,899. John Carnochan was awarded the contract for roofing for $375; the contract of painting and glazing was awarded to W. J. Carson for $2,250. The other tender was John Strang and Son for $4,350. Thomas Brethour got the contract for plastering for $1,749. A. Bowan and Sons tendered $2,150. McKinley and Northwood got the plumbing for $3,-881. M. M. O'Connell tendered $4,298, J. R. McLennan, $4,400 and Currie and Livock, $4,557. Donnelly and Company get the electric work for $1,889. J. A. Ellacott tendered $2,486. Sheldons, Limited, are awarded the contract for the ventilation for $1,713. Eadie-Douglas tendered $1,942. The galvanized iron work is awarded to Dunning's Sheet Metal Works for $1,400. McFarlane and Douglas, Limited, tendered $1,-547 and McKinley and Northwood $1,-718. Terrano Flooring Compang of Canada gets the flooring for $1,351; J. R. Smith, the closet partitions for $373 and the International Marine Signalling Company, the boilers for $1,273.

Strathcona, Alta.

The contract for the building of the new $75,000 post office in this city has been relet to Piggot and Son, contractors, of Hamilton, Ont., the next lowest tender to the late Wm. Garson, of Calgary.

Saskatoon, Sask.

The contract for the new Saskatoon Club building goes to Hogan Marr, for a sum in the neighborhood of $23,000.

South Vancouver, B. C.

The contract for erection of municipal hall was let to Wm. Louden, $12,-000 on condition that only union labor will be employed and that it be completed ten weeks from the date of signing.

Winnipeg, Man.

The general contract for erection of Central Y. M. C. A. has been awarded to Hazelton & Walin, Union Bank Building, $308,000; Mitchell Gray Electric Company got the contract for electric work, $18,000. Associated architects, Jackson & Rosencrans, and J. H. G. Russell.

Residences

Brockville, Ont.

Tenders are called until June 8th for erection of residence for Dr. W. H. Woodrow. Dimensions of building, 50 ft. x 20 ft. Shingle and stucco construction.

London, Ont.

Tenders addressed to A. L. Dent, Woodstock, will be received until June 2nd for erection of brick residence for A. L. Dent Plans, etc. upon application to Messrs. Knott & Sangster, Masonic Temple Building, London, or at the office of Taylor & Taylor, architects, Brantford.

Montreal, Que.

Tenders are about to be called by Messrs. Saxe & Archibald, architects, Montreal, for the construction of a residence on Metcalf avenue, Westmount, for Mr. Richard Egan. Estimated cost, $14,000.

Magrath, Alta.

Tenders addressed to E. E. Carver, L.R.I.B.A., 201 Sherlock Building, will be received until May 30th for erection of residences for the Bank of Montreal. Plans, etc., at offices of the above.

Port Arthur, Ont.

Tenders will probably be called about June 1st for residence for D. S. Cranston. Architect, Mr. Chapman; estimated cost, $4,000.

St. Catharines, Ont.

The larger manufacturies here are considering an organization by which homes for employees may be built.

Summerside, P. E. I.

Tenders will shortly be called for the manse for the Presbyterian church. Estimated cost, $4,000. Architect, Mr. Chappell, Charlottetown. Thos. E. Ramsay, chairman building committee.

AWARDED

Regnia, Sask.

The contract for erection of residence for Mr. J. F. Anderson, of Tracknell, Anderson & Co., has been let to W. G. Dand, $10,000.

Winnipeg, Man.

The contract for a new apartment block on the corner of Rosedale ave. and Pembina street, Fort Rouge, for J. Munroe, of Brandon, has been awarded to MacKissock & Thomas. Wm. Fingland is the architect. Cost about $20,-000.

Business Buildings and Industrial Plants

Amherst ,N. S.

The Rhodes-Curry Company will rebuild that part of their plant destroyed by fire recently. The new buildings will be fireproof, of steel and concrete. N. Curry, president.

Coquitlan, B. C.

The Canada Pacific Steel Company is reported to have purchased a 200-acre factory site at Pitt Meadows. Contracts it is stated, will be directly given for erection of suitable buildings and the machinery purchased in Europe.

Calgary, Alta.

Tenders are called until June 1st for alterations and additions to the Bank of Montreal here. Hodgson, Bates, & Butler, architects, The Grain Exchange.

The purchase of 97 acres for industrial sites will be recommended to council by the new industries committee of the city council.

Architect McIllroy, 118 A., 8th ave. west, is preparing plans for a business and apartment block in East Calgary to cost about $25,000, for J. A. & D. M. Carson.

Elora, Ont.

The by-laws to assist the Elora Furniture Company and the T. E. Bissell Company towards further extensions were carried.

Edmonton, Alta.

A six-storey hotel in the east end, occupying a frontage of 66 feet, is to be erected during the summer and fall by a company organized by Robert F. Klein, proprietor of the Grand View hotel, McDougall avenue, at a cost of $85,000. Plans, etc. will be called and specifications for the construction of the hotel.

Fredericton, N. B.

The N. B. Foundry plant was destroyed by fire on the 28th inst. Estimated loss about $50,000. Messrs. McFarlane, Thompson & Anderhon, owners.

Fenrie, B. C.

It is reported that a saw mill costing $400,000 is to be constructed opposite Baynes, on the Kootenay river. A company is also reported incorporated with a capital of $20,000,000, which will include all the mill properties above the point at which the big mill is to be erected.

Guelph, Ont.

W. A. Mahoney, architect, is preparing plans, etc., for a large factory, 60 ft. x 300 ft., 4-storeys, for Independent Tire Company; also preparing plans for alterations and additions to the Brown-Lee block for an up-to-date office building, including all modern conveniences in the way of elevators, vaults, etc.

The council have recommended the granting of the request for fixed assessment by the Colonial Whitewear Company, in return for which a factory to cost about $20,000 will be erected.

High River, Alta.

Tenders are called until June 1st for erection of branch building for Bank of Montreal here. Noted in last issue.

Ingersoll, Ont.

The by-lay fixing the assessment of the John Morrow Screw Company in return for which an additional plant to cost about $150,000 will be built, was carried.

Kemptville, Ont.

The sawmill and cheese box factory owned by Messrs. Show & Earle were destroyed by fire on the 24th inst.

Lethbridge, Alta.

The Gordon Nail Works, of St. John, N. B., it is stated, will locate here. The plant will start with a capacity of about 90,000 kegs of nails per annum. M. L. McDonnell and J. J. Gordon are interested.

Montreal, Que.

Peloquin's Hotel at Back River was destroyed by fire on the 26th inst. Loss, about $75,000.

Moncton, N.B.

The Burton Saw Company, of Vancouver, have entered into negotiations with the council here with regard to their location here. J. Burton and W. H. Wilson, representatives.

Medicine Hat, Alta.

The Alberta Glass Co. is being organized in Calgary for the purpose of building and operating a glass factory at Redcliffe, five miles from here. The organizers are A. E. Cross, manager of the Calgary Brewing Co., and associates of Calgary. Capital, $160,000.

North Bay, Ont.

Tenders will be received by the Young Co., Ltd., for erection of large brick and mill constructed warehouse. For further information address J. Francis Brown, architect, Toronto.

Ottawa, Ont.

A. Leb. Weeks is calling for tenders for the addition to the J. M. Garland and Sons warehouse.

Orillia, Ont.

J. H. Robertson, architect, will prepare plans for the additions, etc., to the plant of the National Hardware Company.

Port Arthur, Ont.

Mr. John Stirrett, of Hymers, has applied to council for permission to erect a sash and door factory in conjunction with his mill.

The Hewison Contracting Company, this city, formerly Stewart Hewitson & Co., have begun the excavation for the building for the Port Arthur Wagon Works Co., Ltd. Building will be 400 feet x 100 wide, part one-storey and part two-storey. Tenders will be called shortly.

Perth, Ont.

W. Fry Colwill, architect, Guelph, is preparing plans for erection of a factory for the Perth Carpet Mills Company. R. Dodds, Guelph, is interested.

Port Arthur, Ont.

The Finnish Co-operative Trading Co. will soon begin the erection of brick veneer store at corner of Bay and Second streets. The building will be 435 x 100 ft., two storey, and basement. Frederick Urry, architect. Estimated cost, $10,000.

Quebec, Que.

The Dominion Corset Company and Carbello Carriage factory were damaged on the 2t8h inst. Estimated loss, about $250,000.

Regina, Sask.

Tenders were called until May 30th for the several trades required in the erection of 3-storey addition to the Alexandra hotel. Sharon & Darrach, architects.

Tenders were called until May 25th for erection of business block on Eleventh avenue for the Western Trust Company. Materials needed, steel, marble, elevator, stone, etc. Estimated cost, $80,000. Sharon & Darrach, architects.

Shediac, N.B.

Tenders addressed to R. A. Frechet, Moncton, N.B., will be received until May 31st for erection of building. Plans, etc., at parish priest's house and at house of the above.

St. Catharines, Ont.

The by-law to grant concessions to the Yale Townes Lock Company in return for which a large factory will be erected, was carried.

Simcoe, Ont.

Tenders are called until June 1st for the trades, except plumbing, heating and wiring, required in erection of store here. Plans, etc. at the office of the H. S. Falls Co. of Simcoe, Ltd., and at the office of Burke, Horwood & White, architects, Toronto.

Trenton, Ont.

The Jules Motor Company are stated to be seriously considering the location of their plant here.

Vancouver, B. C.

Building permit was granted to J. M. McLuckie for a 7-storey business block on Pender street, $70,000.

Victoria, B.C.

Plans are being made and very shortly tenders will be called for by the Grand Trunk Pacific Company for the erection of a large building on its site on Wharf street. Capt. C. H. Nicholson, manager G. T. P. Steamship Co. The amount involved in the big undertaking is $300,000.

Vancouver, B.C.

[illegible] at the [illegible] lumber mill in Burrard Inlet were destroyed by fire recently.

The demolition of the one-storey buildings on the [illegible] Rogers property on Granville street, extending from Pender street to the [illegible] behind the Bank of Commerce, is to commence on June 1, in preparation for a commencement on the construction of the large new ten-storey block which Ald. Rogers is to build on the site at a cost of $500,000.

Wynyard, Sask.

The flour mill owned by Geo. Spearman was destroyed by fire on the 26th inst. Total loss, $20,000.

Welland, Ont.

A building site has been purchased here for the Canadian branch of the Imperial Mfg. Co., of Warren, Pa. Construction of factory, 50 x 62, will be commenced at once. Herbert & Geo. Hesch will be in charge. Industrial commissioner, B. J. McCormick.

Winnipeg, Man.

The Union Trust Company will erect an 8 or 10-storey block corner of Main and Lombard streets. W. W. Evans, manager.

The Hudson Bay Company will erect a fireproof garage of reinforced concrete between York and Broadway on Garry street. Woodman & Carey submitted the design.

The "Free Press" Publshing Company have purchased a building site on Carlton street. Plans for the new building will be prepared at once. Excavation on the new site will commence next month, and the construction will be proceeded with as rapidly as possible. The building will have a frontage of approximately 75 feet, widening to 90 feet in the rear, 30 feet being reserved for future extensions. While the plans are not yet prepared, it is exexpected that the building will be of steel, concrete and stone—the last probably of the native variety. The building will be thoroughly fire-proof in its character.

AWARDED

Brandon, Man.

The contract for the International Harvester Company's fine new five-storey warehouse has been awarded to the Carter, Hall and Aldinger company of Winnipeg, for $54,000. The building is to be of mill construction, with brick walls.

Chatham, N.B.

The Chatham Tile and Cement Co. have let the contract for the building of their new factory on Richmond street west to W. M. Drader. Construction will be begun at once.

Ft. William

The C. P. R. has let contract for new freight offices to be erected near No. dock to Mr. McDiarmid. The building will be of brick. Estimated cost, $12,000.

Montreal, Que.

Mr. Huberdeau is the contractor for a 4-storey factory to be constructed on Dowd street for Mr. A. P. Rolland. Estimated cost, $50,000. Architect, Mr. A. H. Lapierre.

Moncton, N.B.

The Rhodes-Curry Company, of Amherst, have been awarded the contract for the addition to the office building of the Intercolonial Railway at Moncton. It will cost $100,000.

Ottawa, Ont.

[illegible] the contract for the carpentering work

Continued on page [illegible]

Tenders and For Sale Department

Town of Oshawa, Ontario

Concrete Sidewalks

Tenders will be received up to noon of the **3rd day of June, 1911**, for the construction of 24,000 square feet (more or less) of cement concrete sidewalks on streets in the above town. Specifications and further information may be obtained at the office of the Town Engineer, Town Hall, Oshawa.

The lowest or any tender not necessarily accepted.

FRANK CHAPPELL,
Town Engineer.

Oshawa, Ont., May 20, 1911. 21-22

Tenders

For the Construction of a Reinforced Concrete Subway

Sealed and endorsed tenders addressed to the Chairman of the Utilities Committee will be received at the office of the City Clerk up to 5 o'clock p.m., **June 30th, 1911**, for the construction and supply of all materials in connection therewith.

Plans, specifications and forms of tender may be obtained at the office of the City Engineer, Fort William; the office of the Contract Record, 220 King street west, Toronto; Canadian Engineer, 62 Church street, Toronto, or Builders' Exchange, Winnipeg.

The lowest or any tender not necessarily accepted.

JOHN WILSON,
City Engineer.

City Engineer's Office,
May 16th, 1911. 22-24

Tenders

For

Waterworks Supplies, Etc

TAVISTOCK, ONTARIO,

Sealed tenders addressed to the town clerk will be received up to 12 o'clock noon on **Wednesday, June 14, 1911**, for waterworks supplies and labor as follows:—

Approrimately 2,250 feet of 8-inch, 2,550 feet of 6-inch and 2,100 feet of 4-inch cast iron water pipe, about 7 tons of special castings, about 16 hydrants, valves, etc. Also excavating for, laying and covering above pipe. One steel elevated tank.

Conditions and forms of tender, plans and specifications may be seen at the office of either of the undersigned.

Lowest or any tender not necessarily accepted.

F. W. FARNCOMB,
Consulting Engineer.
64 Bank of Toronto Chambers, London, Ont.
J. G. FIELD, Village Clerk.
Tavistock, Ont. **21-23**

Bucket Crane

FOR SALE—One full circle, self-propelling, modern 10 to 15-ton capacity Browning size No. 1 Locomotive Crane, standard gauge, 4-wheel truck, 38 ft. steel boom, 8 x 10 engines, equipped to handle Clam or Orange Peel. Will furnish with or without bucket. Attractive price, fine condition, quick delivery. Inspection here.

WILLIS SHAW MACHINERY CO.
39 So. LaSalle Street, Chicago.

CITY OF SASKATOON

Sub-Structure for 19th Street Subway

Sealed tenders, addressed to the City Commissioners, Saskatoon, and endorsed "19th Street Subway," will be received up to twelve o'clock noon on **Thursday, June 15th, 1911**, for the above.

All informtaion may be obtained from M. H. McLeod, Chief Engineer, Canadian Northern Railway, Winnipeg, or from George T. Clark, City Engineer, Saskatoon.

The lowest or any tender not necessarily accepted.

JAMES CLINKSKILL,
W. B. NEIL, City Commissioners.
E. M. SNELL,
Saskatoon, Sask. May 23, 1911. 22-23

To Contractors

Sealed tenders endorsed "Tender for Plumbing, etc.," addressed to the undersigned will be received at this Department until noon on **Thursday, June 8th, 1911**, for the Plumbing, Heating and Electric Wiring required at No. 5 Queen's Park. Plans and specifications can be seen at this Department.

An accepted bank cheque payable to the order of the Hon. J. O. Reaume, Minister of Public Works for five per cent. of the amount, and the bona fide signatures and addresses of two sureties, or the bond of a Guarantee Company, approved by this Department, must accompany each tender. Cheque will become forfeit to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after the acceptance.

The Dehartment will not be bound to accept the lowest or any tender.

By order,
H. F. McNAUGHTEN,
Secretary Public Works, Ontario.
Department of Public Works, Ontario,
Toronto, May 27th, 1911.

Newspapers publishing this advertisement without authority will not be paid for it. 22-22

BOARD OF EDUCATION

Tenders Wanted

Sealed tenders addressed to the secretary-treasurer of the Board will be received until

MONDAY NOON, MAY 29th, 1911

for enlargement of the following schools:

FERN AVENUE

OGDEN

RODEN

Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied with an accepted bank cheque for 5 per cent. of the amount of tender or its equivalent in cash.

The lowest or any tender will not necessarily be accepted.

W. W. HODGSON, W. C. WILKINSON,
Chairman of Committee. Sec.-Treas.

Toronto, Ont., May 22. 21-22

City of Fort William, Ont.

SALE OF MUNICIPAL PUMPING & ELECTRICAL GENERATING PLANT

Tenders in bulk or in part will be received by the city clerk, addressed to the Chairman of Utilities Committee, on or before the 1st day of July, 1911, for the sale of the following equipment:

2 Duplex Compound Northy Pumps, High pressure cylinder, 14 in. diam; low pressure cylinder, 20 in. diam.; pump cylinder, 11 in. diam; stroke cylinder, 15 in. diam. Capacity of each, 600 gallons per minute.

1 tandem compound engine—cylinders 21 in. x 46 in., and 40 in. x 46 in.

1 engine 20 in. x 46 in. with counter shafting pulleys and belting complete.

1 Westinghouse revolving field 600 kw., 2 phase, 60 cycles, 2400 volt generator with exciter, switchboard, etc.

1 royal electric 180 kw., 133 cycle, 2400 volt, generator with exciter, switchboard, etc.

The above equipment has been thrown out of use by hydro-electric power and water gravitation system, but would be suitable for a town of 5,000 population.

Machinery can be inspected at any time at the city power house, Fort William.

The successful tenderer must be prepared to have lots awarded to him cleared from the site before the **1st day of September, 1911.**

For further information apply at city engineer's office.

JOHN WILSON,
City Engineer.
May 17, 1911. **21-23**

Tenders Wanted

Bulk and separate tenders for all or any of the several branches required in the erection and completion of a proposed Public School Building to be built at Brawnsvills, Ont., will be received up till noon, **Saturday, June 10th, 1911.**

All tenders shall be sealed and marked "Tender" and addressed to J. W. Hopkins, Esq., Secretary Public School Board, Brawnsville, Ont.

Plans and specifications may be obtained upon application to the secretary, or seen at the office of Taylor & Taylor, architects, Hope Chambers, Brantford, Ont.

The lowest or any tender not necessarily accepted.

Dated June 23rd, 1911. 22-22

TOWNSHIP OF SCARBORO

Tenders

For Reinforced Concrete Arch Bridge

Tenders will be received by the undersigned up to twelve o'clock noon of **Monday, June 5, 1911,** for the construction of a reinforced concrete arch bridge of 20 ft. span over a branch of the Highland Creek, on the highway between lots 18 and 19, concession 2, township of Scarboro.

Pans and specifications may be seen and all necessary information may be obtained at the offices of the undersigned, 57 Adelaide street, east, Toronto.

The lowest or any tender not necessarily accepted.

BARBER & YOUNG,
Scarboro Township Engineers.

Toronto, May 19, 1911. 21-22

City of Prince Albert

Tenders for

POWER WORKS

Sealed tenders will be received until 8 p.m., Tuesday, June 13th, 1911, by the Corporation of the City of Prince Albert, Province of Saskatchewan, for the construction of Dam and Headworks and Canal and Power Station Foundations, being portions of the proposed Hydro-Electric Power Development, on the North Saskatchewan River, at La Colle Falls, (distant 25 miles east of the city).

Tenders are invited on each separately, and must be plainly marked on the outside of envelopes, and addressed to the Secretary-Treasurer, City of Prince Albert, Saskatchewan.

Each tender must be accompanied by an accepted bank cheque, for $5,000, payable to the Secretary-Treasurer, which cheque will be returned to the bidder, unless he fail to execute a contract, should it be awarded to him.

The successful bidder, on each of the works, will be required to execute a Bond, in the sum of $10,000, for the faithful performance of the contract.

The City reserves the right to reject any or all tenders.

The plans and specifications will be on file, and may be seen on and after **May 23rd, 1911**, at the City Hall, Prince Albert; office of "Canadian Engineer" at Winnipeg; office of "Canadian Engineer," Montreal, or at the offices of the Engineers, C. H. & P. H. Mitchell, Traders Bank Building, Toronto, Ont.

ANDREW HOLMES, Mayor.
C. O. DAVIDSON, Secretary-Treasurer

Prince Albert, Sask.,
May 9th, 1911. 20-22

TOWN OF NORTH BAY

Sidewalk Construction

Sealed tenders, endorsed "Tender for Sidewalks," and addressed to the Commissioner of Works, will be received up till noon on **Wednesday, June 7th, 1911,** for the construction of approximately 100,000 square feet of Concrete Sidewalks and Crossings.

Plans and Specifications may be seen, and form of tender obtained on application to the undersigned.

A marked cheque for $500 must accompany each tender.

The lowest or any tender not necessarily accepted.

T. N. COLGAN,
Commissioner of Works.

North Bay, Ont., May 22, 1911. 22-22

Contractors' Material
IN CANADA

Blacksmith drill (power or hand) 10-in. swing.
Leonard Engine (Ball Aut. High Speed).
Sturdevant Steel Fan 35-in. diameter, 12½-in. outlet.
Two Beatty 1-yd. dredges.
One Beatty ½-yd. ditching dredge.
No. 6 Austin crusher, with screen, new 1907, used half time.
No. 5 Champion crusher, also screen.
Eight Steam Drills and one air drill.
50 h.p. Portable steam boiler.
Thirty tons 20 and 25 lb. relaying rails.

Have you anything to sell? Write us.
THE MALES COMPANY,
82 Perin Bldg., Cincinnati, Ohio.

VILLAGE OF BIGGAR SASKATCHEWAN

Sealed tenders marked Tender No. 1, Tender No. 2, Tender No. 3, Tender No. 4, Tender No. 5, Tender No. 6, Tender No. 7, will be received by the Sec.-Treas. of the Village of Biggar, Sask., up till noon, **Tuesday, June 13th, 1911**, for the following:

Tender No. 1. Trenching, laying and back filling for cast iron water mains, hydrants, valves, etc.

Tender No. 2. For supplying cast iron water mains and specials.

Tender No. 3. For supplying hydrants, valves and valve boxes.

Tender No. 4. For supplying and installing all pump machinery.

Tender No. 5. For supplying and installing [illegible]

Tender No. 6. For erection of a power house.

Tender No. 7. For the construction of a concrete reservoir.

An accepted cheque equal to five per cent. of the amount of tender must accompany each tender.

Plans and specifications can be seen at the offices of the Secretary-Treasurer of the Village of Biggar, Sask., or the Engineer, Yorkton, Sask., or copies can be had from the Engineer on deposit of a marked cheque for $10, which cheque will be returned on return of the plans and specifications.

[illegible] McARTHUR
Consulting Engineer,
Yorkton, Sask.

22-23

TOWN OF SAULT STE. MARIE
Ontario

Sealed tenders addressed to W. H. Munro, mayor, will be received by C. J. Pim, town clerk, up to 5 p.m. **Monday, June 5, 1911,** for the construction of Section "M" of the sewer system. The approximate quantities are as follows:—

1. 4,600 lineal feet of 18 in. tile sewer.
2. 2,900 lineal feet of 15 in. tile sewer.
3. 4,500 lineal feet of 12 in. tile sewer.
4. 2,600 lineal feet of 10 in. tile sewer.
5. 4,400 lineal feet of 8 in. tile sewer.
6. Number of Manholes, 45.
7. Number of catchbasins, 67.

Plans, specifications and Form of Tender may be seen at the office of town engineer on or before **May 22, 1911.**

A marked cheque for the sum of $1,000 must accompany each tender.

The lowest or any tender not necessarily accepted.

W. H. MUNRO, Mayor.
W. F. GRANT, C.E. Town Engineer.

21-22

Department of Railways and Canals

Ontario—St. Lawrence Canals
Rapide Flat Canal

Sealed tenders addressed to the undersigned and endorsed "Tender for Improving Lower Extreme to Lock No. 24," will be received at this office until 16 o'clock on **Friday, June 9th.**

Plans, specifications, and Form of Contract to be entered into can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the resident engineer of the Ontario—St. Lawrence Canals, Cornwall, at which places form of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $9,000.00 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, May 19th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 21-22

TOWN OF GODERICH

Storm Sewer Extensions

Sealed tenders will be received by the Town of Goderich, addressed to the Town Clerk, until 4 p.m. Thursday, **June 15th, 1911**, for the furnishing and laying of approximately 12,800 lineal feet of storm sewers, building manholes, catchbasins, etc. Plans and specifications may be seen and all information obtained at the Town Clerk's office.

The lowest or any tender not necessarily accepted.

L. L. KNOX, Town Clerk.
M. G. CAMERON, Mayor.

Goderich, Ont., May 27, 1911 22-23

Tenders For Jail at Guelph

Whole or separate tenders will be received by the undersigned up till **Friday, June 9th**, for the erection of jail and jailer's residence in the City of Guelph, County of Wellington.

Plans and specifications may be seen at the office of the architect, W. A. Mahoney, Telephone Building, Guelph, or at the office of the Contract Record, 220 King street west, Toronto.

Lowest or any tender not necessarily accepted.

T. J. MOORE, City Clerk,
Guelph, Ont.

22-23

CITY OF MOOSE JAW
Sask.

Sewer and Water Extensions

Sealed tenders endorsed "Contract 37 or 36," as the case may be, will be received by the City of Moose Jaw addressed to the undersigned City Clerk until 8.30 p.m. on **Monday, June 19th, 1911**.

Any tender received after the above stated time will be declared informal.

Contract 36.—The laying of approximately 7,900 lineal feet of 24-inch Trunk Sewer.

Contract 37.—The laying of approximately 16,832 lineal feet of sanitary sewer of varying sizes and approximately 19,197 of water main of varying sizes.

Plans and specifications may be seen at the City Engineer's office.

Contract 38.—The supply of approximately:
236 lineal feet of 24-in. c.i. pipe.
358 lineal feet of 18-in. c.i. pipe.
6787 lineal feet of 12-in. c.i. pipe.
4669 lineal feet of 10-in. c.i. pipe.
3598 lineal feet of 8-in. c.i. pipe.
4905 lineal feet of 6-in. c.i. pipe.
Also special castings.

Contract 39.—The supply of approximately:
6710 lin. ft. of 24-in. vitrified tile pipe.
526 lin. ft. of 18-in. vitrified tile pipe.
4582 lin. ft. of 10-in. vitrified tile pipe.
11506 lin. ft. of 8-in. vitrified tile pipe.
150 lin. ft. of 6-in. vitrified tile pipe.
Also junctions, bends, etc.

Specifications for 38 and 39 may be obtained from the City Engineer's office upon application.

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer,
Moose Jaw, Sask.
W. F. HEAL, City Clerk,
Moose Jaw, Sask.

22-23

TOWN OF WELLAND

Notice to Contractors

Sealed tenders endorsed "Tender for Pumping House Foundations, etc.," addressed to R. Cooper, Chairman of Water Commissioners, Welland, Ont., will be received until noon of **Saturday, June 10th, 1911**, for Excavation, Concrete Foundations, etc., for waterworks power house.

Plans and specifications may be seen at the office of R. Cooper, Chairman of Water Commissioners, Welland, Ont., and at the office of the designing engineer, Wm. Kennedy, Jr., Y.M.C.A. Building, Montreal, Que. 22-22

CITY OF CALGARY
ALBERTA

Tenders
FOR TRUNK SEWER

Sealed tenders marked "Tender for Trunk Sewer" will be received by the undersigned up till noon on **Tuesday, June 13th, 1911**, for the construction of a six-foot diameter concrete trunk sewer about Twelve Thousand feet (12,000 ft.) long for the City of Calgary.

Each tender must be accompanied by an accepted bank cheque for $500 payable to the City Treasurer, which will be returned to the bidder unless he fails to execute a contract, should it be awarded to him.

The successful bidder will be required to execute a bond in the sum of Thirty Thousand ($30,000) for the faithful performance of the contract and a guarantee of maintenance for one year after the contract is completed.

The City reserves the right to reject any or all tenders.

Plans and specifications can be seen at the office of the City Engineer at Calgary; the office of the Contract Record, Toronto; office of Canadian Engineer at Winnipeg, and the Engineering Record, 239 West 39th street, New York.

W. D. SPENCE,
City Clerk.

22-23

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

POSITION WANTED—As Superintendent or walking boss on railroad or other construction work, by experienced man who can furnish excellent references. Apply Box 271, Contract Record, Toronto, Ont.

Positions Vacant

WANTED—Salesman for Plumbing and Heating business. Apply stating refeerences and experience. Box 277 Contract Record, Toronto, Ont.

Miscellaneous

Advertisements under this heading two cents per word per insertion.

WANTED—A large American manufacturer wants a good representative supply house in main cities of Canada to handle their line of A.C. and D.C. Watt Hour Meters. A good proposition. Address E. J. Macintyre, care Electrical News, 220 King street west, Toronto.
6-6, 19-20

Business Buildings and Industrial Plants

(Continued from page 61)

for M. Drazin's building to O. Rose and John Carriers.

Toronto, Ont.
The Haileybury Construction Co. have been awarded the contract for the construction of a passenger station at Matheson.

Vancouver, B. C.
The Norton Griffiths Steel Construction Company has been awarded the contract for the construction of a large filter house for the B. C. Sugar Refining Company. The contract price is understood to be $80,000 and work will be started immediately.

Victoria, B. C.
The contract for construction of telephone building for the B. C. Telephone Company has been awarded to J. L. Skene & Co., $65,000. Thos. Hooper, architect.

Winnipeg, Man.
MacKissock and Thomas have been given the contract for a block in Rosedale to cost $20,000. William Fingland is architect.

Power Plants, Electricity and Telephones

Brandon, Man.
A by-law for $25,000 for the purpose of laying rails for the street railway on the streets to be paved will be submitted. City Engineer, Speakman.

Biggar, Sask.
Tenders are called until June 13th for erection of power house here. F. McArthur, consulting engineer. For further information see advertisement in "Tenders and For Sale Department" of this issue.

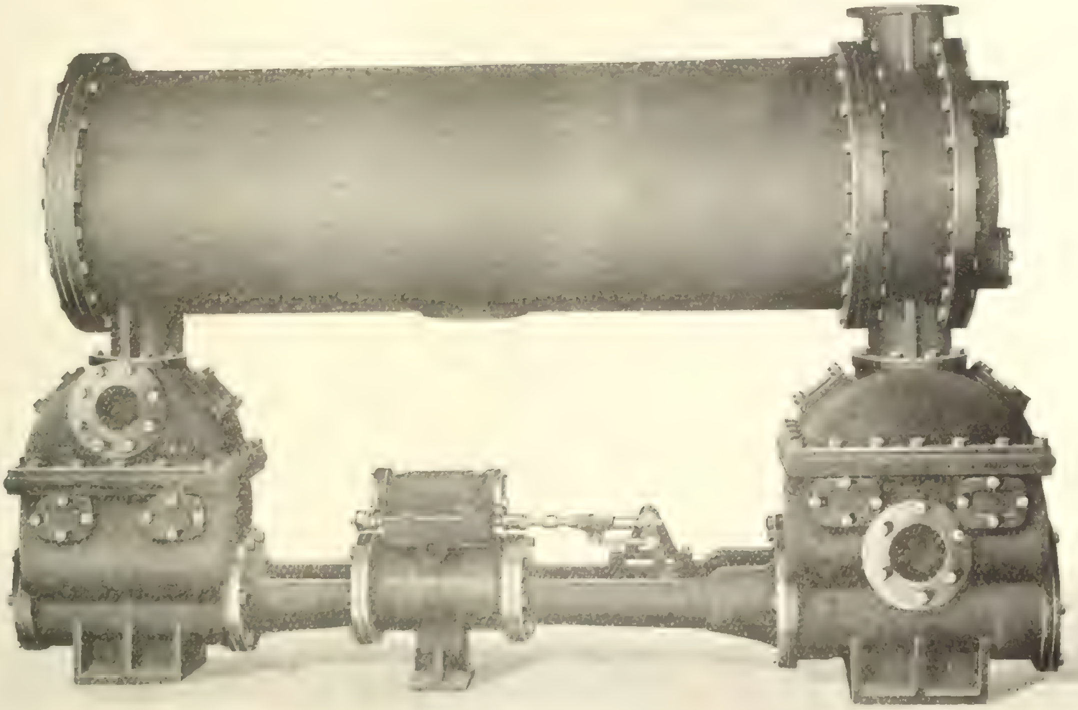
Calgary, Alta.
Tenders for feeder voltage regulators were as follows: Type I. R. T., C. G. E., 60 cycles, 300 amp., hand operated, $1700; motor operated, $1825; Canadian Westinghouse, 60 cycles, 200 amp., 38 k.v.a., hand operated, $1245; motor operated, $1530. Tpye I. R. S.; C. G. E., 60 cycles 300 amp., hand operated, $875; motor operated, $1,000; Can. Westinghouse, 59 k.v.a., 300 amp., 60 cycles, hand operated, $2150; motor operated, $2430. Automatic motor operated type; C. G. E., $1950.

Edmonton, Alta.
The proposition of a municipally owned gas plant will be placed before the ratepayers shortly.

Galt, Ont.
By-law to authorize the expenditure of $25,000 for the extension of the Hydro-electric system was carried.

Grand Coulee, Sask.
Tenders addressed to E. C. Vallance, secretary-treasurer, will be received until June 10th for erection of six miles of the Sunrise Telephone Company; also to string wires for 2¾ miles on the L. D. line; line to be built and completed according to government rules and regulations.

Condensors



Condensor built by The John Inglis Co., Limited

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

Let us Submit Prices.

The John Inglis Company

Engineers and Boilermakers

Limited

14 Strachan Ave., TORONTO, Canada

Lindsay, Ont.

A by-law submitting the agreement between the town and the Light, Heat & Power Company regarding the purchase of the local power plant will be submitted to the people. The purchase price of the private plant is $30,000.

Middleton, N.S.

The electric lighting plant here will be constructed this summer. 100 h.p. steam boiler and engine will be installed. Ratepayers have voted appropriation. Estimated cost, $15,000.

Minnedosa, Man.

Tenders addressed to H. F. Maulson, P. O. box 369, Minnedosa, will be received until June 15th for construction of the power station foundation and penstock and the spillway and intake structures. Plans, etc., at office of Messrs. Taylor, Colwill, barristers, Portage la Prairie; and at the office of the secretary of the company, Minnedosa.

Nanaimo, B.C.

A communication was received by council from Messrs. Stewart and Rogers, of Victoria, offering to install a tramway system in the city without a bonus from the council, to commence construction within four months from date of franchise and to complete the same within a period of twenty-four months. Referred to the council tramway committee. A similar proposition has also been submitted by another syndicate.

Orillia, Ont.

The municipal generating plant at Ragged Rapids will be enlarged by the erection of a new dam and power house some 1,500 feet down stream from the present generators. Mr. W. K. Greenwood is town engineer.

St. Mary's, Ont.

A charter has been secured from the Dominion Parliament by the Imperial Traction Company for the construction along the Hydro-electric route, of an electric railway from Hamilton to Stratford and London with extensions to Sarnia and Niagara Falls.

Stettler, Alta.

The town council have retained the J. Galt Engineering Company as engineers on the proposed electric lighting system.

Saskatoon, Sask.

The city engineer reported on the street railway, presenting the following figures for a system of 5,700 lineal feet of double track, permanent construction; 14,700 lineal feet of single track, permanent construction, and for 29,280 lineal feet single track, temporary construction. The permanent construction would be of eighty pound high tee rails, pine or fir ties, on six inch concrete, the whole embedded in concrete half way up the webb of the rail, the balance taken up by paving block. The temporary construction would be of 70 pound rails on No. 1 tamarac ties with gravel ballast.

The required equipment would be 12 single track cars, two sweepers, one sprinkler and one truck car. The estimate is based on the assumption that power could be had from the new power house by putting in more machinery. The cost of power installation is based on a 400 kilowatt generator, 750 h.p. engine and 500 h.p. boiler. The cost would be as follows: Track and overhead work, $301,000; cars and equipment, $75-000; power installation, $30,000; car barn and repair shops, $20,000; engineering and contingencies, $25,000. Total $451,000.

A supplementory report will be issued when more information is received.

Victoria, B.C.

Tenders for 200 standards of the New Westminster type for the cluster lighting system have been received by the city at the following prices: Hutchinson Bros., New Westminster type, $42 each; Seattle type, $46; an alternative standard, $44; the present type already installed with slight modifications, $54; B. C. Foundry & Engineering Company, $78; Shackey King Company, New Westminster, $43. Referred to City Electrician and H. M. Fullerton, chairman electric light committee.

AWARDED

Guelph, Ont.

P. H. Secord & Sons, Limited, of Brantford, are the successful tenderers for the construction of the St. Patrick's Ward extension of the Radial Railway Company.

Miscellaneous

Moose Jaw, Sask.

Four by-laws, providing for the expenditure of $240,500 for public improvements, carried. W. F. Heal, city clerk.

Ottawa, Ont.

The following permits have been issued recently. Victor Realty Co. dwelling, Cameron street; R. A. Kemp, builder, $3,000; Thomas Clarey, dwellings, Centre street, $4,500; J. P. Band, dwellings, Ella street, $5,700; Sunnyside avenue, $5,700 and Daly avenue, F. A. Booth, builder, $8,000; A. Tracy, apartments, Gilmour street, $15,000; Cephus Ross, dwelling, Carling avenue, F. Stata, builder, $5,000; Thomas Rochon, dwelling, St. Andrew street, N. Poirier and Sons, builders, $3,000; R. C. Church, stone addition, St. Patrick street, N. Poirier and Son, builder, $10,000; J. W. Mooney, dwelling, Monkland avenue, W. H. George, architect, Alexander, Campbell and Eamon, builders, $6,500; Philip Lennon, dwelling, Arlington street, $7,000; O. Pommerville, apartment house, Cooper street, Murphy Brothers, builders, $9,300; Russell Brownlee, dwelling, 4th avenue, James Brownlee, builder, $3,000; Stewart McClenaghan, addition, J. P. Maclaren, architect, George Roy, builder, $4,000; R. J. Arthurs, dwelling, Brighton avenue; J. Cummings, builder, $2,000; Thomas Lowry, dwelling, Frank street, $2,500; W. O. Byrnes, dwelling, Archibald street, $3,000; O. B. Shortly, dwelling, J. A. Ewart, architect, Alex. Robertson and A. Richards and company, builders, $8,000; Charles Ogilvie, residence, C. J. Burritt, architect, C. and W. H. Lester and Ferguson, $7,000; James S. Wilson, dwelling, Chapel street, $3,500; James Hill, dwelling, O'Connor street, $5,000.

Jobidon & Gravel, contractors, Quebec., are stated to have assigned.

Martin & Johnson, sash door manufacturers, Vancouver, are stated to have dissolved.

New Companies

J. Lefebvre, Limited, Montreal, Que., capital, $100,000, incorporated to carry on business as general contractors. Incorporators, C. P. Lefebvre, manufacturer, agent; J. Lefebvre, contractor, both of Montreal.

Otis Quarries, Limited, Montreal, Que., capital, $50,000; incorporated. Incorporators, K. R. Otis, quarry master; J. A. Lamarche, K.C., both of Montreal. and De Gaspe Beaubien, civil engineer, Outremont, Que.

Canadian Electric Welding Company, Limited, Montreal, Que., incorporated, capital, $500,000. Incorporators, G. V. Cousins, E. G. Penny, barristers, both of Montreal, Que.

The National Paper Company, Limited, Montreal, Que.; incorporated; capital, $100,000. Incorporators, E. B. Busteed and C. Lane, Advocates, both of Montreal.

Prince Rupert Hydro-Electric Company, Limited, Montreal, Que., capital, $5,000,000. Incorporators, O. B. MacCallum, and G. V. Cousins, advocates, Montreal.

Canadian Metal Seal Company, Limited, Montreal, incorporated; capital, $300,000. Incorporators, J. W. Blair, F. J. Laverty and G. Dutaud, advocates, all of Montreal.

Factory sites, Limited, Montreal, Que. incorporated, capital, $200,000. Incorporators, F. Roy, K.C., J. H. Dillon, advocate, both of Montreal.

Business Notes

Kavanagh & Saunderson, plumbers, Montreal, are stated to have dissolved.

A winding-up order has been granted to the Nominigue Pulp Wood supply Co., Montreal.

W. J. Pierson, Fort William, contractor, is stated to have assigned to A. N. Thompson.

Manager Wilford Phillips, of the Winnipeg Electric Street Railway, has notified the city engineer of the materials ordered for extensions of the street railway lines this year. The material ordered will lay about eight miles of track. 80 pound rails will be used throughout.

The B. C. Gazette gives notice of the incorporation of the following companies: John K. Miller Company, Limited, capital, $3,000, incorporated to carry on the business of wholesale and retail sheet-metal workers; Fort George Trading & Lumber Company, Limited, capital, $200,000; The Coost Construction and Investment Company, Limited, capital, $50,000; New Ladysmith Lumber Company, Limited, capital, $400,000; Canadian Construction Company, Limited, capital, $30,000; Davis Brothers Electric Company, Limited, capital, $10-000; Snowden-Bidlake Logging Company, Limited, capital, $50,000.

MacLean Daily Reports

The only systematic method yet devised for reporting BUILDING AND ENGINEERING projects from their inception to completion. Ask us for Rates and Specimen Reports.

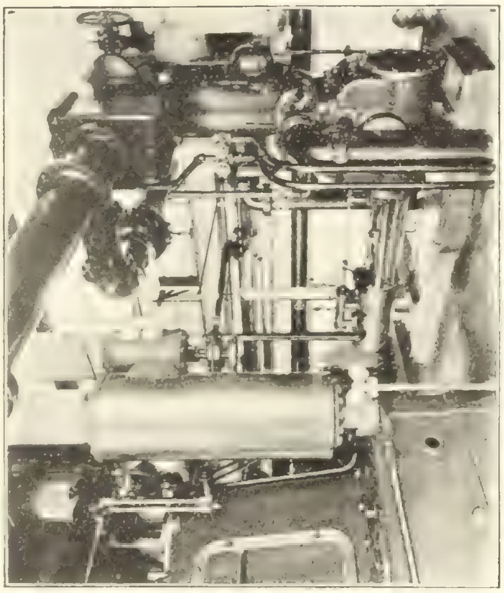
220 King Street West - TORONTO

STEAM CONDENSERS

We called attention last week to the importance of condensing apparatus in modern steam power plants, and will be glad to forward bulletins on the subject.

The independent air pump and cone jet condenser will save from 20 to 30 per cent. in steam when applied to non-condensing steam engines, or will give a corresponding increase of power.

We get the best results by designing and building condensing apparatus specially to suit the conditions of operation.



THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

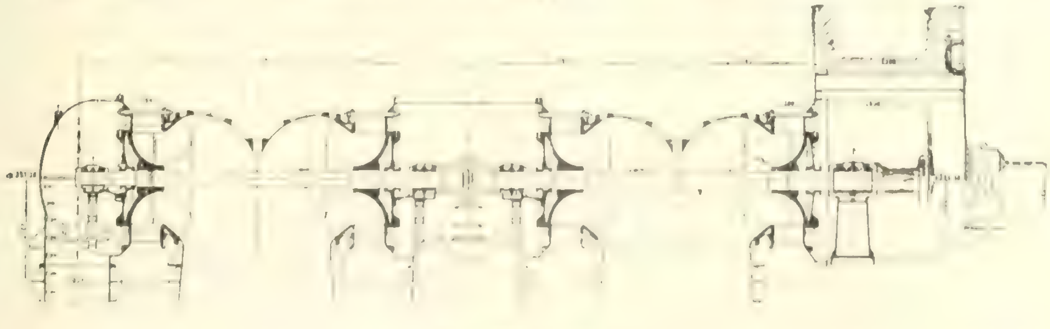
LIMITED

Works 512 William Street, MONTREAL Sales Offices Montreal, Toronto, Winnipeg, Cobalt, Calgary, Vancouver

---

WATER-POWER PLANTS
LOW PRESSURE TURBINES

Any Output. 5,000 Turbines Supplied. 2,000,000 Horse Power.



26 ft. Head. 5,000 H. P.

Four Units as illustration on order for the German-Swiss Water Power Company

ESCHER WYSS & CO. - ZURICH, SWITZERLAND

CANADIAN HEAD OFFICE, 408 LUMSDEN BUILDING, TORONTO

PHONE, ADELAIDE 234

KAHN SYSTEM

OF REINFORCED CONCRETE

RIB METAL

For reinforcing floors and roof slabs, conduits, etc.

PLACED IN SHEETS MEANS ECONOMY

United Steel Sash floods your building with light—is strong, rigid—fireproof. Other products: Kahn Trus bars, rib bars, Hy-rib column hooping, Trus-Con Chemical products for waterproofing, and finishing concrete.

Correspondence Respectfully Solicited.

Trussed Concrete Steel Co.
of Canada, Limited
Head Office: WALKERVILLE - ONTARIO

BRANCHES:
TORONTO—23 Jordan St.
WINNIPEG—Union Bank Bldg.
MONTREAL—128 Coristine Bldg.
VANCOUVER—52 Hutchinson Bldg.

AGENCIES:
QUEBEC, HALIFAX.

Armstrong
CRANES

Built for Every Service
up to 75 tons capacity

Electric Traveling Cranes, Standard
Electric Traveling Cranes, Special
Electric Gantry Cranes
Electric Jib Cranes
Hand Operated Cranes
Locomotive Cranes
Hydraulic Cranes

H. J. ARMSTRONG
Engineer and Manufacturer
Markdale, Ont., Can.

There is just one excuse for plaster ceilings:——

Only people not familiar with the multiple merits of Preston Steel Ceilings would permit a plaster ceiling to be placed in any house or store they are building. You, as a builder or contractor or architect, should see to it that your customers are made acquainted with the only modern, sanitary, fire-proof, damp-proof and PERMANENT ceiling. Let us prove its excellence to you, and you can then assert it to your customers.

Any property will rent or sell quicker when the ceilings are Preston Steel Ceilings. For these can be decorated beautifully as soon as installed—and the beauty endures. They need no repairs, for they will outlast the building itself. Yet their first cost—which is the FINAL cost—is remarkably little. Your profit is bigger, and the buyer of the property will be better satisfied. On rebuilding jobs, they can readily be used over old plaster.

Preston Steel Ceilings Cost Less Suit Best

Send for big illustrated pattern book, showing a few of the many styles we offer at lowest prices. Let us send you Price List.

PRESTON STEEL CEILINGS
HELP TO SELL HOUSES

The Metal Shingle & Siding Co.
Limited
Preston, Ontario
Branch Office and Factory - MONTREAL

SHAWMUT VITRIFIED PAVING
——BRICK WORKS——

SHAWMUT PA. **ALFRED YATES, GEN. MGR**

Vitrified Shale and Fire Clay
Paving Bricks and Blocks

Burned in Yates' Patent Kiln

Samples and Prices on Application

Fred Holmes, President C. P. Holmes, Sec'y-Treas.

Telephone North 663

Fred Holmes & Sons
Limited

Building Contractors

1113 Yonge St., Toronto

CONTRACTORS

Bridge Lifting Tower, L. S. & M. S. Ry

Here is an Object Lesson for Contractors

When the Lake Shore and Michigan Southern Railway built the first of these Lifting Towers, they used

"IDEAL" CONCRETE BLOCKS

for the lower story **only,** and high priced brick for the second story.

After the Tower was completed, the Lake Shore Railway were so satisfied with "Ideal" construction that they have since built twelve such Towers of "IDEAL" BLOCKS THROUGHOUT, having their own "IDEAL" Machines and making their own blocks.

Figure on "Ideal" Concrete Blocks, as well as brick or stone, on your next contract.

WE'LL send you full information.

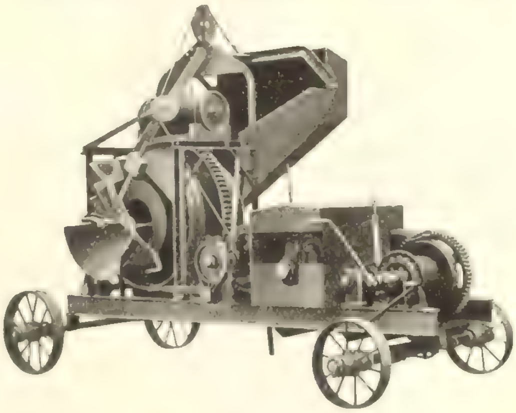
IDEAL CONCRETE MACHINERY CO., LIMITED
Dept. B - London, Ont.

The Foote Concrete Mixer

STEAM — GASOLINE — ELECTRIC

Unequalled for speed of

LOADING — MIXING — DISCHARGING



Special Builders Outfit

with electric motor and hoist for operating concrete bucket or other light hoisting

The General Machinery Co., Ltd.
526-7 Traders Bank Building
TORONTO, ONT.

The Carey Roof Standard

CAREY'S FLEXIBLE CEMENT ROOFING

TO PROVE TO YOU the high standardized construction and composition of Carey's Roofing, we want to send you Booklet and Sample Free, and give you practical information regarding Carey's Roofing based on 25 years' actual time proved tests. Carey's Roofing is equally adapted to flat or steep surfaces, wood sheathing, tile or concrete. Whether your contract is large or small, we want to show you the advantage of using a standardized roofing material. The Philip Carey Mfg. Co., 60 Wayne Ave. Cincinnati, O. [illegible] Branches.

"FAMOUS FOR DURABILITY"

Terra-Cotta Fireproofing

Get an Estimate from

ROBERT BENNETT
Contractor

347½ Euclid Avenue, Toronto

☞ Over 25 years experience in U. S. and Canada

PHONE COLLEGE 4362

RAILWAY CONSTRUCTION PLANT

Hoisting Engines, Horse Powers, Hand Winches, Derricks, Car Wheels, Axles and Boxes, Dump Cars, Rail Cars, Buckets

MARSH & HENTHORN, Limited

Makers of Hoisting Machinery, BELLEVILLE, ONT.

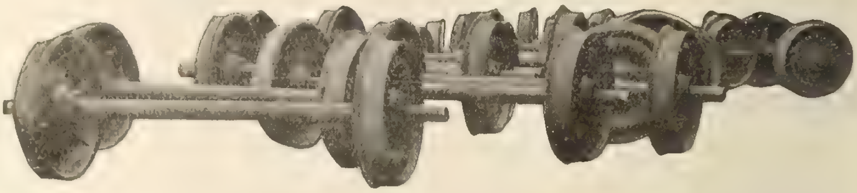
Send for Catalogue

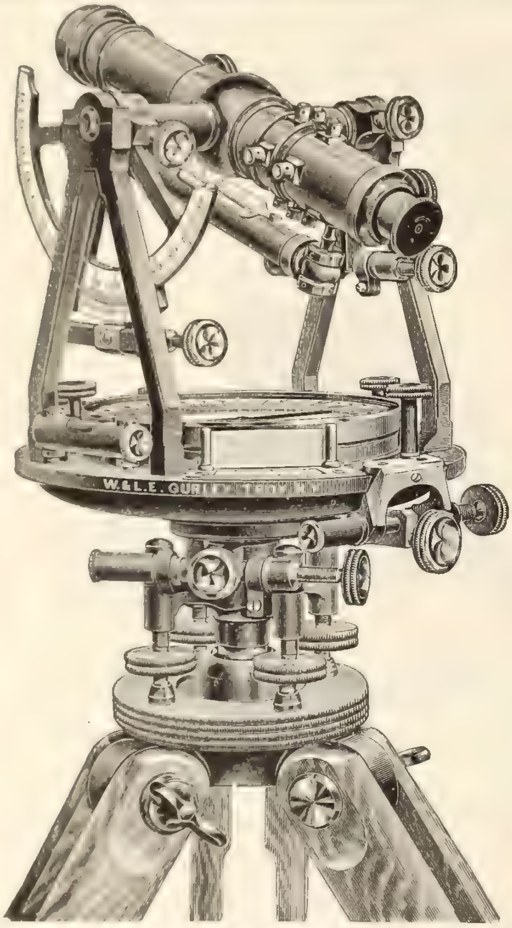
SALES AGENTS

MUSSENS

LIMITED

Montreal, Que.





1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

- Transits
- Y Levels
- Compasses
- Plane Tables
- Current Meters
- Levelling Rods
- Chains
- Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

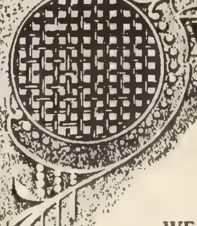
Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited

Dundas - Ontario



ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES

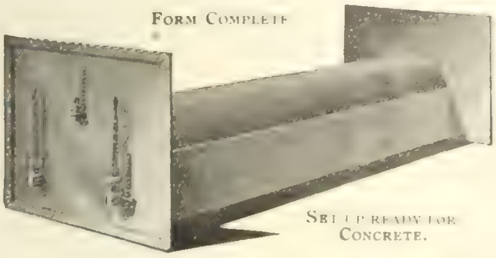
Canada Wire Goods Mfg. Co.

HAMILTON, ONT.

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.



Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

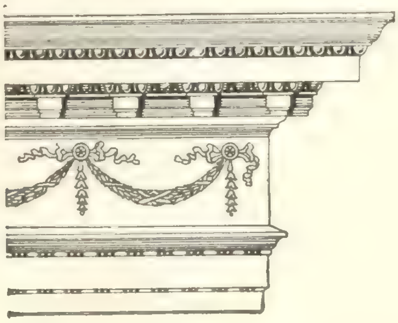
Write for Form Catalogue
Engine Catalogue for the asking
Commissioner's Time Book Free

Concrete Form & Engine Co.
Successor to Collapsible Steel Form Co.
83 Congress St., W., Detroit, Mich.

A good appeaance is a letter of recommendation—a house well built, a monument to the builder.

Superior Quality Material and Workmanship Count

Metallic Cornices



are the MOST ARTISTIC, MOST DURABLE and MOST EASILY ERECTED cornices you can place on any building.
They are made of sheet copper or galvanized steel and are absolutely rust proof.
"Metallic" cornices can be furnished in any design desired to suit your drawings and specifications.
Let us give you prices and full information--send us your specifications. Our catalogue of sheet metal building materials, No. 70, will interest you. Write for it.

Manufacturers 1951

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City

DOORS

Pine and Hardwood Veneer

Interior Finish

Stair Work

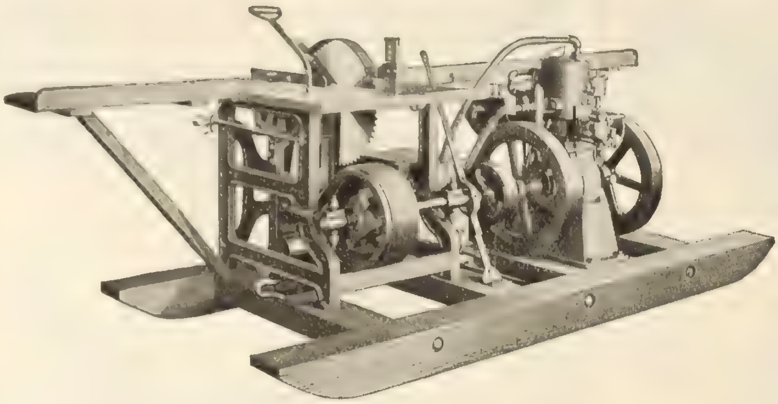
Interior Hardwoods

Send us your plans and specifications and let us quote you

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario

Here's a Money Maker

Read What a User Says



Oshkosh Logging Tool Company,
Oshkosh, Wis.

Gentlemen:

In reply to yours of the 23rd, would say that we have one of your Portable Saw Rigs on this job.

We have ten buildings here on this contract for the John Morrell & Company packing plant, most of which are of reinforced concrete.

We would say that we have a carpenter and a helper on this saw and that they work practically eleven hours every day. We have never lost any time on this work on account of the saw rig being out of order except from changing dry cells.

We can recommend this machine as a money saver on any job, large or small, and would say that if we had this job to do over again we would buy two.

A carpenter and a helper on this saw very easily do the work of six carpenters. Thus you will see that we consider this machine has already paid for itself on this job, although it is yet as good as new.

We can heartily recommend this saw rig to all contractors as it fills a long-felt want in our business.

Yours truly,
COLLINS BROS.

Oshkosh Portable Saw Rigs

MADE BY

Oshkosh Logging Tool Co., OSHKOSH, WIS.

CANADIAN REPRESENTATIVES:

General Supply Co., Ottawa, Ont. **J. L. Neilson, Winnipeg, Man.** **H. W. Petrie, Vancouver, B. C.**

Coal Conveyor Empty.

SCANDINAVIA
FEDERAL ENGINEERING & SUPPLIES LIMITED
TORONTO
BELTING

For Conveying and Transmission

A Good Belt Dressing.

Federal Engineering & Supplies, Ltd.

284 Yonge Street, Toronto. **329 St. James Street, Montreal.**

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800yds. two inch top; or 1000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U.S.A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver

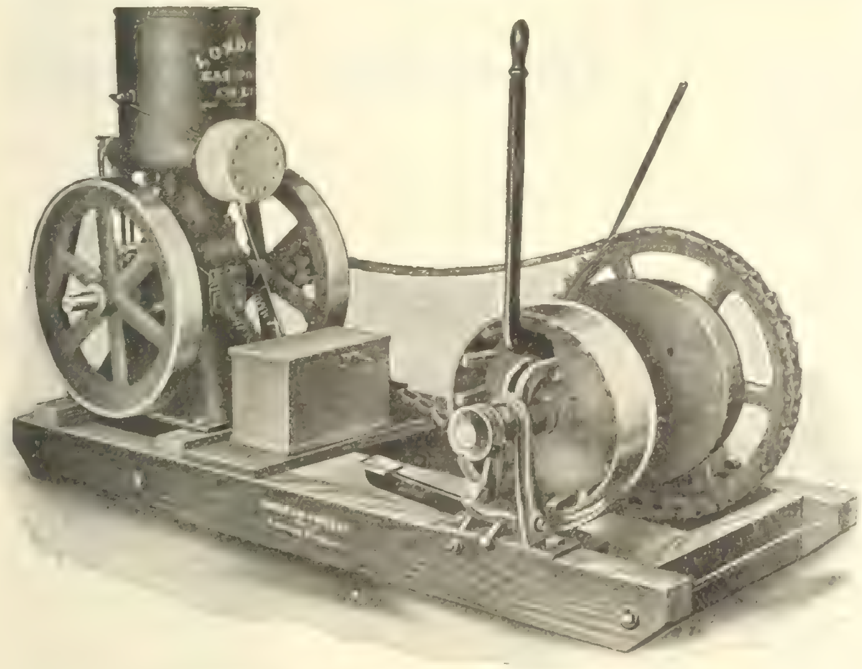
Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager



Complete 5 H. P. Hoisting Outfit, Operating Side

Here is a Hoisting Outfit that Has Saved Money Let it Save Yours

A "**London**" self contained engine mounted on the strong bolted frame with our famous **"London" Friction Clutch Hoist** with ball bearing thrust, will give you an outfit hard to beat.

The gearing consists of sprockets and heavy malleable iron chain.

Send for our Literature which contains complete description of the above outfit.

The London Gas Power Company Limited, London, Canada
ENGINEERS and MACHINISTS

TENDERS

For Roofing and Sheet Metal Work

in all parts of Canada

Communicate with

A. Schwoerer & Sons, Inc.
530-34 E. 80th St. New York, N.Y.

Now working in Winnipeg, Regina, Vancouver, Montreal and Ottawa

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President
Thos. C. Irving Jr., Vice-Pres.

Jas. W. Moffat, Secretary
Chas. Warnock, Treas. & Man.

Robert W. Hunt & Co. Limited
Bureau of Inspection, Tests and Consultation

Head Office and Laboratories Canadian Express Bldg., Montreal, Que.
Branch Offices: Traders Bank Building, Toronto, Ont.
Norfolk House, Laurence Pountney Hill, London, E.C.

Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's New Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

is a **continuous** concrete reinforcement. Even transverse continuity is secured without lap. Hooks attach the adjacent strips together.

Did you ever stop to consider the cost of the lapped portions of non-continuous reinforcement? Or the consequence of too much economy in this direction?

For spans up to eight feet there is no better reinforcement than **Perfection Wire Mesh.**

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

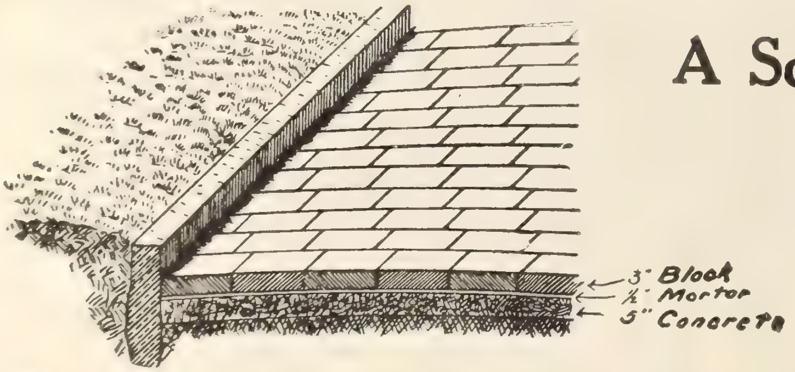
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

for Highest Efficiency, Absolute Reliability, Greatest Economy

Used by the Largest Mining Companies and Hydro-Electric Plants.
Also Extensively for Dredging, Exhaust Steam, Compressed Air, etc.

Sizes 3 to 42' Diameter up to ½' in thickness

Easily installed and securely connected with our Forged Steel Flanges or All Steel Bolted Joints.

Write for our catalogue 14 and prices on your requirements

AMERICAN SPIRAL PIPE WORKS - MAIN OFFICE CHICAGO
NEW YORK OFFICE—50 Church Street

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)
"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."
W. S. Downing, (Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April [illegible]

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.

1032 Garfield Building, CLEVELAND, OHIO

SELLING AGENTS

The Dominion Equipment & Supply Co., Winnipeg, Canada

Permanent Water Proofing of Concrete

The continual expansion and contraction of a concrete surface, due to varying temperature, will in a short time shed its waterproofing compound whatever it is.

Make your concrete waterproof right through by incorporating in your mixture

Guelph Hydrated Lime

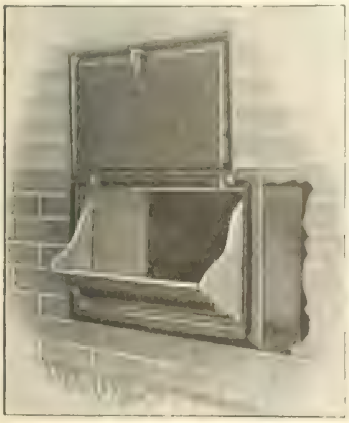
which is very fine and fills all voids.

It improves the appearance of your job by producing a better color and it lessens the cost because lime is cheaper than cement.

Specify **GUELPH HYDRATED LIME** when ordering from your dealer.

Standard White Lime Co.

Guelph - Ontario



EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

[illegible]

The Down Draft Furnace Co., Limited

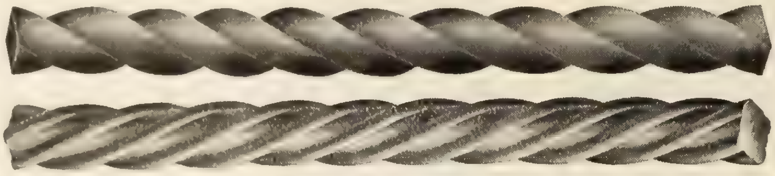
Galt, Ontario, Can.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing

Squares and Rounds 3-8 in. to 1 1-4 in.

Elastic Limit 50,000 lbs. or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate Shipment from Stock

Cut to Required Lengths

BUFFALO STEEL CO., Tonawanda, N.Y. "Suburbs of Buffalo, N.Y."

Toronto Office
117 Home Life Building

Producers of the Celebrated

"Peerless" Bedford Stone

Bedford Indiana Limestone

Mill Blocks
Sawed Planed and Turned Stone

W. McMILLAN & SON

(Incorporated)

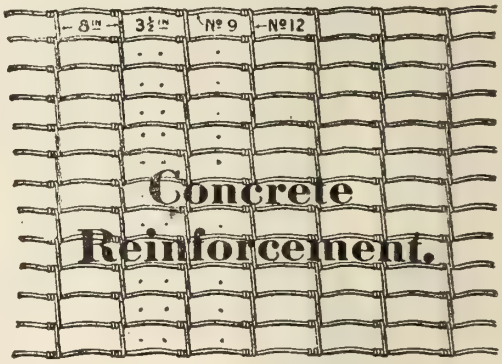
General Offices
Chamber of Commerce Building
CHICAGO, ILL.

Quarries and Mills { **Bedford, Ind.**
Bloomington, Ind.

Concrete Reinforcement

In 3½ ft. Rolled Units

Page Concrete Reinforcement with a 3½ x 8 mesh, and running wires of 2,200 lb. tensile strength is used on the Harbour Commission Elevator, Montreal, Soulanges Canal, etc. It replaced on the Chambly Dam reconstruction on the Richelieu, a reinforcing that failed, although of large reputaton. This is proof of its quality. It really reinforces concrete work under heavy stresses.



Put up in rolls for easy transportation. Running wires of high carbon steel, not bent or kinked, and of full strength. For adaptable and safe reinforcing of concrete, in dam, retaining wall, and bridge work, factory and foundation work, etc.

PARTICULARS, QUOTATIONS AND SAMPLE ON REQUEST.

Page Wire Fence Company, Limited
Walkerville, Ont.
Toronto Montreal St. John

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

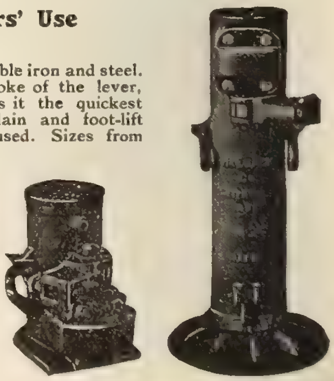
For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY
H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal



IRON STAIRS

Dennis Wire & Iron Works Co.
Limited
London, Canada
Toronto Offices - 12 QUEEN STREET E.

Cut shows a four wheel steam Locomotive Crane with 40ft. boom handling forms on New York Catskill Aqueduct at Valhalla, N.Y These contractors are finding our cranes indispensable in this work, as they can be used for so many purposes; such as handling loose materials as broken stone, sand, concrete, etc., heavy timbers, rails, concrete forms, etc.

THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

(Patented)
Autoforce Air Pump Ventilator

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

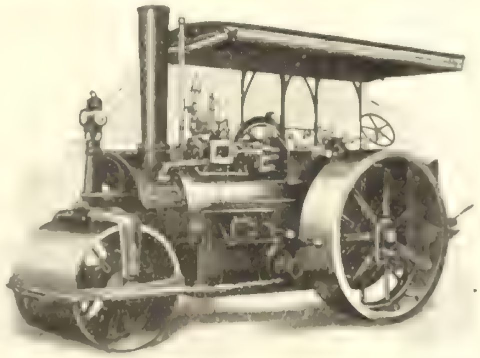
Write us for full Particulars

Sole Licensees and Manufacturers for Canada

Gardiner & Gaskill, 505 Power Bldg. Montreal, Que.

Telephone Main 159

"A Canadian Roller for Canadian Roads"



THE WATEROUS
DOUBLE CYLINDER
STEAM ROLLER

is built essentially to suit Canadian road building conditions. Over 100 Rollers in use in Canada to-day are proving their ability as road makers of the highest quality. A greater rolling capacity, with less cost of maintenance and operation, are its distinguishing characteristics. [illegible]

The Waterous Engine Works Co.
Limited
BRANTFORD, CANADA
Agent:—Hugh Cameron & Co., 72 Queen St. E., Toronto, Ont.

STEEL AND RADIATION LIMITED

Sheets cut in large range of sizes and areas

Plain Round

"Steelcrete"

IS the ideal reinforcement for all classes of Concrete construction, can be successfully laid by unskilled labor and thus reduce your labor costs. Manufactured from open-hearth steel plates by automatic machines which slit and open the meshes simultaneously from the cold sheet, thus increasing the elastic limit and ultimate strength. No "straightening out" ensues when load is applied to split the concrete before reinforcement comes into tension.

Bar Reinforcements

¶ We make a specialty of concrete beam reinforcement and can supply rods and bars up to 66 feet in length fabricated ready for placing in beams, thus saving your time and money.

Plain Square

STEEL AND RADIATION LIMITED

SHOW ROOMS | MONTREAL, 138 Craig St. W.
TORONTO, 92 King St. W. and
80 Adelaide St. E.

Head Office
TORONTO, ONTARIO

Stocks and Agencies in All Leading Cities

TENTS
for Engineers and Contractors

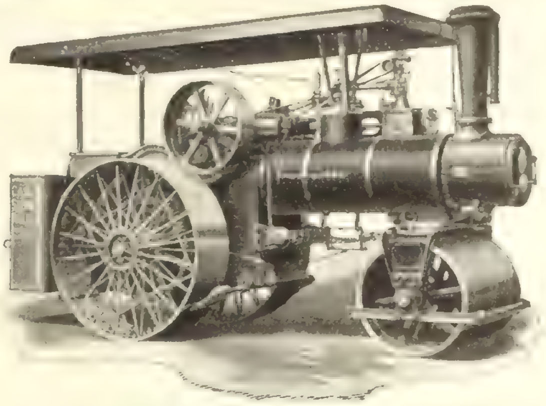
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

Woods Limited
Woods Building - Ottawa, Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT
THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18″ x 26″ cylinder Mogul, Standard Gauge, and 18-10″ x 14″ Vulcan and Davenport dinkeys, 36″ Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36″ Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8″ Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2 Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag Scrapers and 4—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36″ Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW
May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. & Dolland Lane - - MONTREAL, CANADA

Sand and Gravel

Lime
Cement
Plaster
Hair
Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 604 605 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C.P.R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

RECIPROCITY

means to exchange. We have high quality fittings, you have good money. Lets get together.

S BRAND

Cast Iron Fittings and Valves are Right

"Everlasting" Blow-off Valve
SIMPLE — DURABLE — EFFICIENT

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

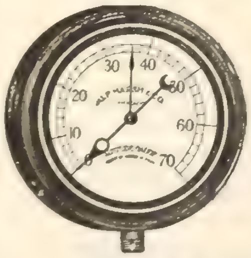
**Reinforced
Concrete
Construction**

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

MARSH GAUGES



FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

THE PRACTICAL TEST

in the furnace is the only reliable one for the finished brick

GLENBOIG

Have Stood The Test

They have been subjected to extreme heat and did not melt to quick changes of temperature and did not expand or contract to hard knocks incidental to transit and furnace working and did not suffer.

They are **the most perfect Fire Bricks in the World.**

MAKER'S SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The
Missisquoi Marble Company
Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd.	Toronto, Ont.
C. N. Barclay	Winnipeg Man.
Bosse & Banks	Quebec, Que.
General Contractors Supply Company, Ltd.	Halifax, N. S.
129 Sparks Street	Ottawa, Ont.
James Robertson Co. Ltd.	St. John, N. B.
G. R. Duncan	Fort William, Ont.
Walker & Barnes	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd.	Vancouver, B. C.
315 Coristine Building	Montreal, Que.

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Limited

Head Office (Manning Arcade)
24 King St. W. Phone Main 591, TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Everything for The Builder

At The Right Price

Interior Trim
Mouldings Turnings
Stair Building
Lumber Lath
Shingles Sash Veneered Doors
Pine Doors Frames
"Empire Brand" Hardwood Flooring

LET US QUOTE YOU

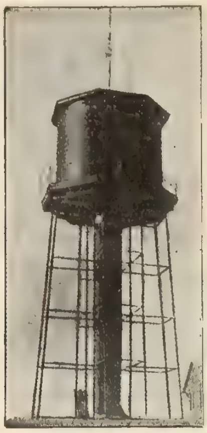
J. R. Eaton & Sons
Limited
Orillia, Ontario

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos
263 Armstrong Ave., Jersey City, N. J., U. S. A.



Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

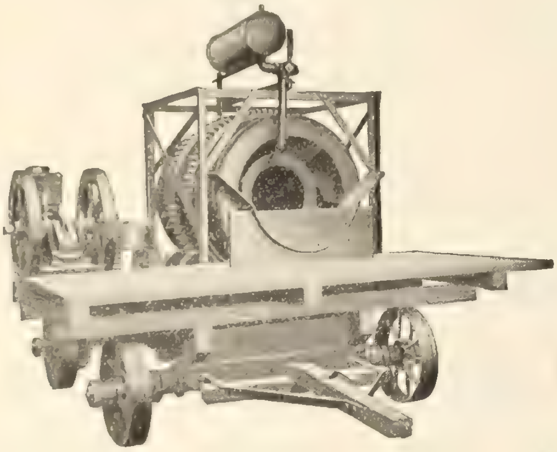
Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

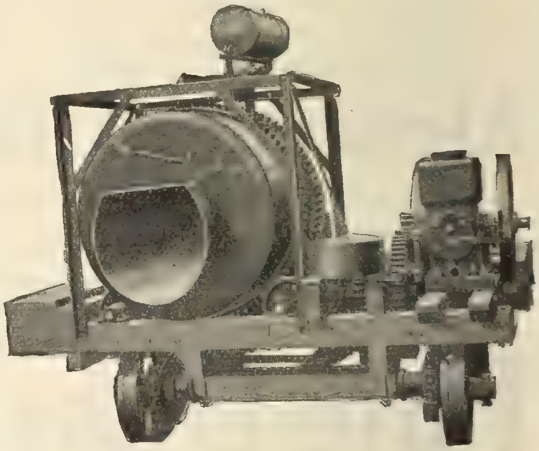
The Low Charging CROPP MIXER

The only Mixer that will not spill when overcharged

Low charge and high discharge covered by Patent 947196.



Either Steam or Gasoline Engine



Our Prices will Interest You

The only mixer having batch constantly in sight of operator.

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.

We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

---

THE Thames Quarry Co.

St. Mary's, Ont.

CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

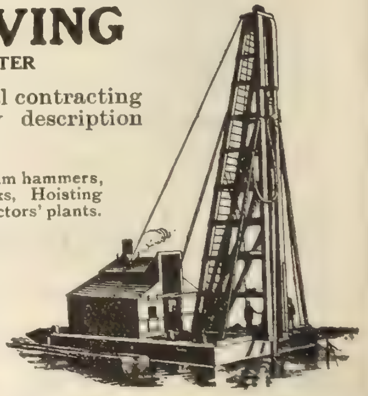
JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.



Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.85	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	...	15.00
91 to 95 "	...	17.50
Brass Goods, Valves, etc.		
96 to 100 "	...	20.50
101 to 105 "	...	24.00
106 to 110 "	...	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	...	...	14.00	10.50
90 u. i.	...	...	16.50	11.50
95 u. i.	...	...	18.00	13.50
100 u. i.	...	...	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 8-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—8-16 inch No. 1 standard, size 6 x 8 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

dard compression work, 65 per cent.

h grade compression work, 60 per cent.

ller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, [illegible] cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Chursbed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 40 cents per foot.

PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

Boiled Linseed Oil, in barrels, $1.23 per gallon lon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, $1.20 per gallon.

Pure Linseed Oil Putty, 25-lb. tins, $4.00 per 100 lbs.

Pure Linseed Oil Putty, bulk, in barrels, $3.50 per 100 lbs.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Rails for Contractors, Switches, Girders, etc.
New and Second Hand

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Bonds of Suretyship [illegible]

Bonds Bid and Supply [illegible]

The
Guarantee Company of North America

[illegible]

Head Office - Montreal

[illegible]

[illegible]

ARTIFICIAL STONE PAVEMENTS

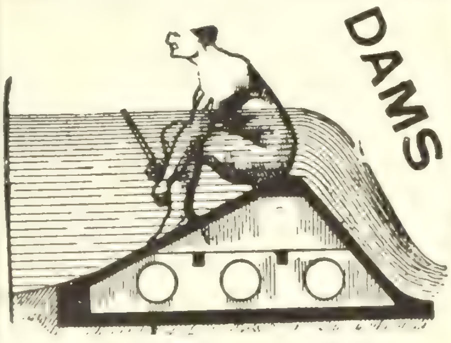
SIDEWALKS A SPECIALTY

CORPORATIONS will do well to consider our work and prices before letting contract

The Silica Barytic Stone Company of Ontario, Limited

WALTER MILLS
General Manager

Head Office:
INGERSOLL, ONT.



AMBURSEN

Hydraulic Construction Co. of Canada, Limited.

450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.

Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty

20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.

References Given

DOMINION BRIDGE CO.

LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone : Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co. Limited

Darlington, England

Bridges

and Steel Structures

Canadian Offices:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

—Bridge and Construction Dep't.—

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS SUPPLIES

WATER WASHED SAND

OUR SPECIALTY

Dealers in
Sand and Gravel
Crushed Granite
Crushed Stone

SAND
&
SUPPLIES, LTD.
TORONTO

The

Phœnix Bridge & Iron Works
Limited

MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

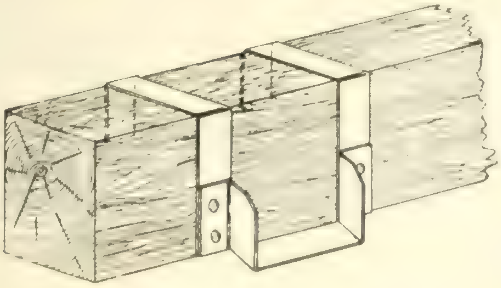
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

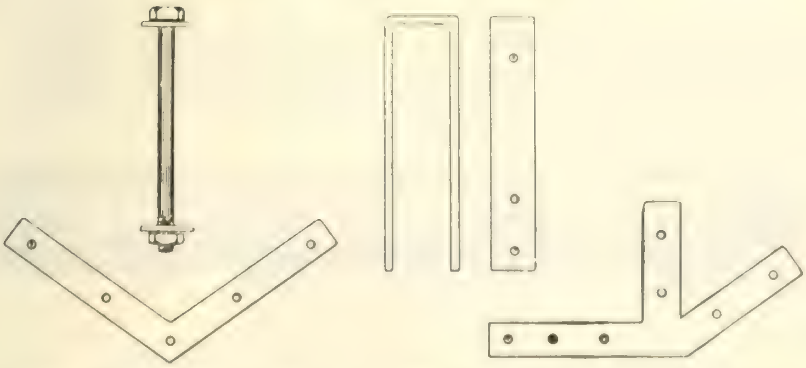
Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company, Ltd.

HAMILTON, ONT.



STEEL JOIST HANGERS, Single or Double



IRON FORGINGS, for Wooden Trusses, Apex Straps, Stirrups, Bolts and Rods made to order

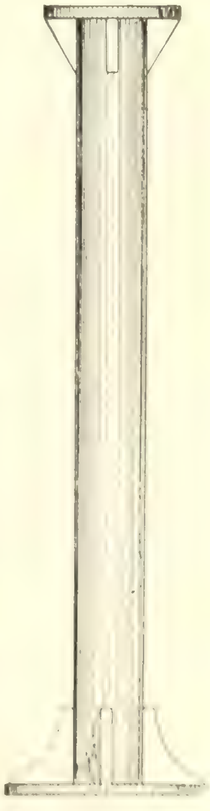
Beams,

Angles,

Channels,

Plates,

Any Size from 1½ inch to 24 inches, and any length up to 70 feet.



CAST IRON COLUMNS, *all sizes and designs*

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O. BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President. J. G. Allan Vice-President. James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

PROMPT DELIVERIES

Fellowes and Fellowes

59 Yonge Street., TORONTO

Engineers' and Contractors' Machinery

Steel Dump Cars, Hoisting Engines, Derricks Pumps, new and second hand Rails and Cars, Turntables, Clam Shell and Orange Peel Buckets, etc. Contractors' Elevating and Conveying Machinery.

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridge's Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power
Civil Engineers
TORONTO WINNIPEG
Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN
CONSULTING ENGINEERS
STEAM, ELECTRIC AND HYDRAULIC POWER
43 KING ST. WEST - TORONTO

T. Harry Mace
ENGINEER
Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete
630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.
Bowman & Connor
Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae
CONSULTING ENGINEER
Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON
ENGINEERS
Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.
405 Dorchester Street East, MONTREAL

John. T. Farmer
MECHANICAL AND HYDRAULIC ENGINEER
427 Coristine Bldg., Montreal

EDW. O. FUCE
Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor
CIVIL ENGINEER
GALT - ONTARIO
Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell
Consulting and Supervising Engineers
Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants
Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.
A. M. Can. Soc. C. E. A. M. Am. Soc. C. E.
Consulting Civil and Municipal Engineer
SPECIALTIES
Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.
315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C. E.
Consulting Engineer
Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work
1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY
Mem. Can. Soc. C.E.
Civil and Hydraulic Engineer
Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.
Suite 413, Pacific Block, Vancouver, B. C.

JOSEPH N. ROULEAU
Submarine Diver
Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.
793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.
Consulting, Civil and Sanitary Engineers
General Municipal Engineering
Specialties: Waterworks, Sewerage and Electric Lighting.
Toronto and Winnipeg
John Galt John Haddin

Allan Keefer
Architect
Ottawa, Ontario

Arthur L. Weeks
Architect
Canada Life Building, Ottawa
Reinforced concrete and steel structures, factories and commercial buildings

NADEL & ADLER
375 St. James St., MONTREAL
The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Jas. A. McIlwraith
General Contractor
For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.
COLLINGWOOD, ONT.

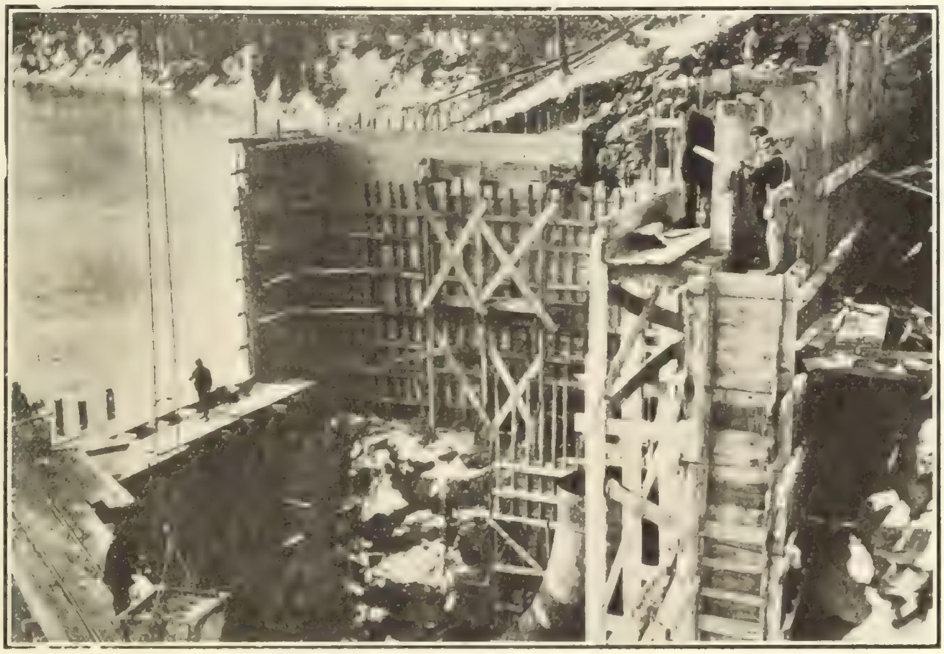
FOR SALE
"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.
Limited
MANUFACTURERS OF
Building Granite, Granite Setts, Curbing, Etc.
Samples Furnished and Prices Quoted on Application
Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.
Bank of Ottawa Bld'g.
224 St. James St. Montreal
Bell Tel. M. 4354

AUTOMATIC SASH HOLDER
saves cord, weights, pulleys, and materials—no pockets—easier to install—for old and new windows. Send for sample and catalgue to-day. Agents wanted. Sold by the hardware trade or direct from 277 Broadway, New York.
Automatic Sash Holder Company

THE FOUNDATION COMPANY
LIMITED

Bank of Ottawa Building - Montreal, Canada



We make a Specialty of

Water Power Construction, Power Plants, Dams

WITH A LARGE EQUIPMENT OF PLANT AND A WELL-ORGANIZED FORCE WE ARE PREPARED AT ALL TIMES TO UNDERTAKE DIFFICULT WORK ON THE SHORTEST NOTICE.

OUR SCOPE:

BRIDGE PIERS - DOCKS - DAMS - SEA WALLS - MINING SHAFTS
WHARVES - TUNNELS - WATER POWER CONSTRUCTION
HEAVY BUILDING FOUNDATIONS

OUR METHODS:

PNEUMATIC CAISSONS - OPEN CAISSONS - WOODEN AND STEEL SHEET PILING
CONCRETE PILES - WOODEN PILES - COFFER DAMS
CONCRETE STEEL CONSTRUCTION

We Invite Inquiries in Reference to Cost and Design of Difficult Foundation Work.

Barrett Specification Roofs

For Large Plants

FOR use on a large modern plant like the Arlington Mills illustrated below, only one kind of roofing is suitable, namely, Barrett Specification Roofs.

The roof area of these buildings is about 22½ acres, which includes saw-tooth, monitor and ordinary flat roofs, under which are valuable machinery and textiles, where a leak might do thousands of dollars worth of damage.

The roof practically gets exposure from both sides, because the humidity of the interior of the building (which is a neceesary feature of textile manufacturing) causes constant condensation of moisture on the under side of the roof.

No other style or type of roofing could be used economically.

Tin and ready roofing would require painting every few years—and think of the cost of painting so vast an area! Slate and shingles are not fitted for use on such buildings.

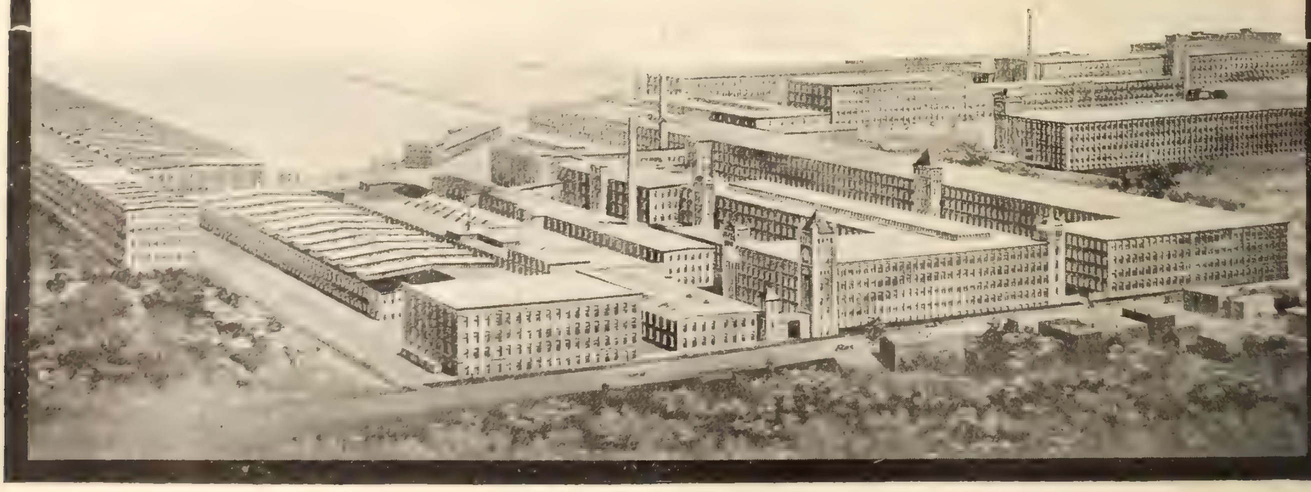
If ultimate economy is desired, a Barrett Specification Roof *must* be used, for its price is lower than that of other permanent roofs and, as it requires no painting, its maintenance cost is nothing. We can point to roofs of this type which have given faultless service for over thirty years without leaks and without repairs.

If you are interested in the roofing problem we suggest you write our nearest office and any information desired will be cheerfully furnished.

The Paterson Manufacturing Co., Limited

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

Arlington Mills, Lawrence, Mass. C. R. Makepeace & Co., Mill Engineers, Providence, R. I.



Power House, Sydney. Electric Power Co., Trenton, Ont.

Engineers prefer to have us handle their work since we look after all details of design in a way impossible to the ordinary builder.

WELLS & GRAY, Limited - Toronto, Ont.

Doors

Midland Brand

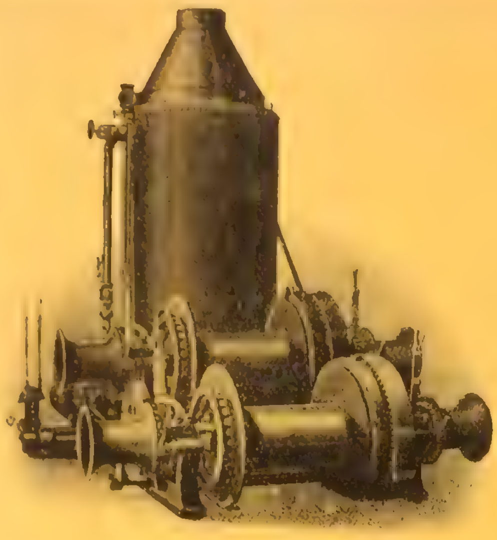
That cannot Warp, Sag, or Crack

Our Doors are made from selected material and by expert workmen. Modern facilities and careful attention to details enable us to satisfy you in price and quality. . . .

Let your next order come to us.

Georgian Bay Shook Mills, Limited

MIDLAND, ONTARIO



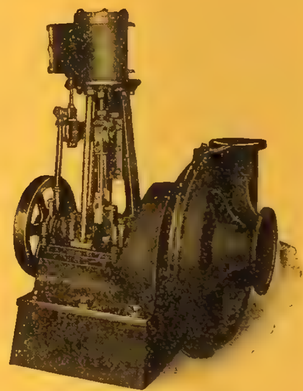
HOISTING ENGINES

We can furnish hoists designed to suit every purpose; our hoists give the maximum results with a minimum cost.

Steam - Belt Driven and Electric **HOISTS**

of all capacities for prompt shipment

Centrifugal Pumps



either with direct connected engine or belt driven

We carry all sizes of centrifugal pumps in stock ready for immediate shipment.

Derricks **Concrete Mixers** **Crushers**

F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.

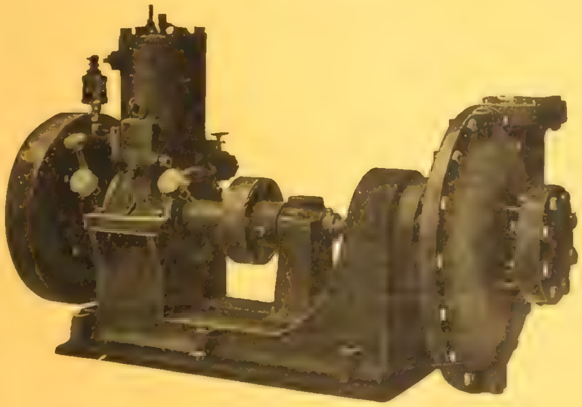
Vol. 25 Toronto, June 7, 1911 No. 23

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

We manufacture Steam and Power Pumps
Condensers, Travelling Cranes, etc.
Write for Catalogue



The **Smart-Turner Machine Company**
HAMILTON, ONTARIO Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

Your Work will Endure
IF YOU USE

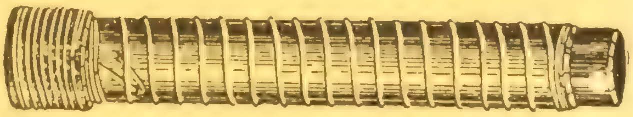
"QUEEN'S HEAD"
CANADA

Galvanized Iron

The extra HEAVY COATING does it

John Lysaght, Limited
Makers
Bristol, Newport

A. C. Leslie & Co., Limited
MONTREAL
Managers, Canadian Branch



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS
for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

---

The Largest and Most Expensive Reservoir in the World

The Ashckan Dam and Dikes near Brown sta. N.Y.

CONTRACTORS: MacArthur Bros. and Co., and Winston and Co., Brown Sta. N. Y.

90 "AMERICAN" Engines
80 "AMERICAN" Derricks
7 "AMERICAN" Locomotive Cranes

Used in the construction of this great project.

¶ Send coupon for information and prices on "AMERICAN" ENGINES, DERRICKS, MATERIAL ELEVATORS, HORSE POWERS, CRABS, ETC. . . . .

American Hoist & Derrick Co.

ST. PAUL, MINN.

AUTHORIZED AGENTS:

Gorman, Clancey, & Grindley,	Edmonton and Calgary, Alta. and Nelson, B. C.
Vancouver Machinery Depot, Ltd.	Vancouver, B. C.
J. L. Neilson & Co ,	Winnipeg, Man.
Dunn Brothers,	Winnipeg, Man.
J. A. McTaggert,	Winnipeg, Man.

AMERICAN HOIST & DERRICK CO. ST. PAUL MINN.

Please send prices and information on "AMERICAN
(state what you are interested in)

____
____

Name ______________________
Address ____________________

It is perhaps not generally known

that we have an Information Department consisting of trained and practical men, whose time is employed solely in answering enquiries from people interested in cement.

Now it will be readily understood

that out of the mass of enquiries that come to us, there are a number that include questions as to what might be termed Allied Industries. These we now answer to the best of our ability, but we could answer them still more satisfactorily, if manufacturers of materials used in conjunction with cement would co-operate to the extent of sending copies of their catalogues and other literature to be placed on file in our office for reference.

We should like to obtain

the names and addresses, together with catalogues, and any other obtainable information of manufacturers of and dealers in:

1. **Concrete Machinery**
2. **Building Blocks**
3. **Cement Bricks**
4. **Tile Molds**
5. **Fence Posts**
6. **Re-inforcing Material**
7. **Water-proofing Compounds**

It is not alone for our own convenience that we make this suggestion; firms who manufacture or deal in such articles will find it to their own advantage to have this information in the hands of our Information Department, thereby enabling us to hand on to them from time to time enquiries for such materials as they severally make.

In sending catalogues, literature or information, please address same to "Sales Department."

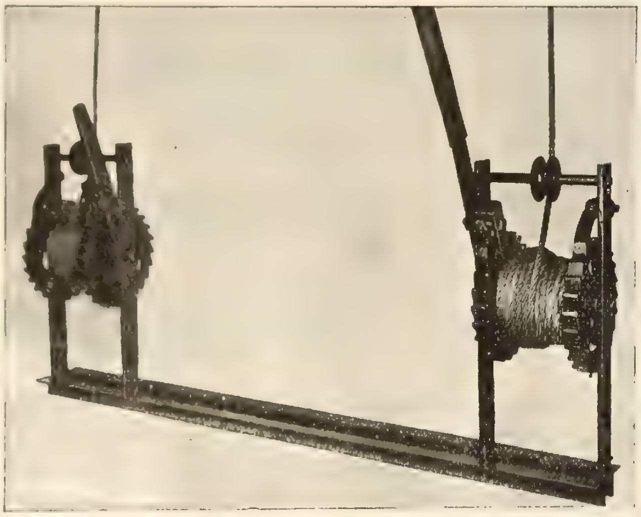
The—

Canada Cement Company

Limited,

Banque National Building - - - MONTREAL

Do You Want to do Rapid
Work with Safety?



Patent
Safety
Scaffolding

Enables you to do
Record Bricklaying

Medal from Museum of Safety
Awarded for
Safety Scaffolding

SEND FOR PARTICULARS

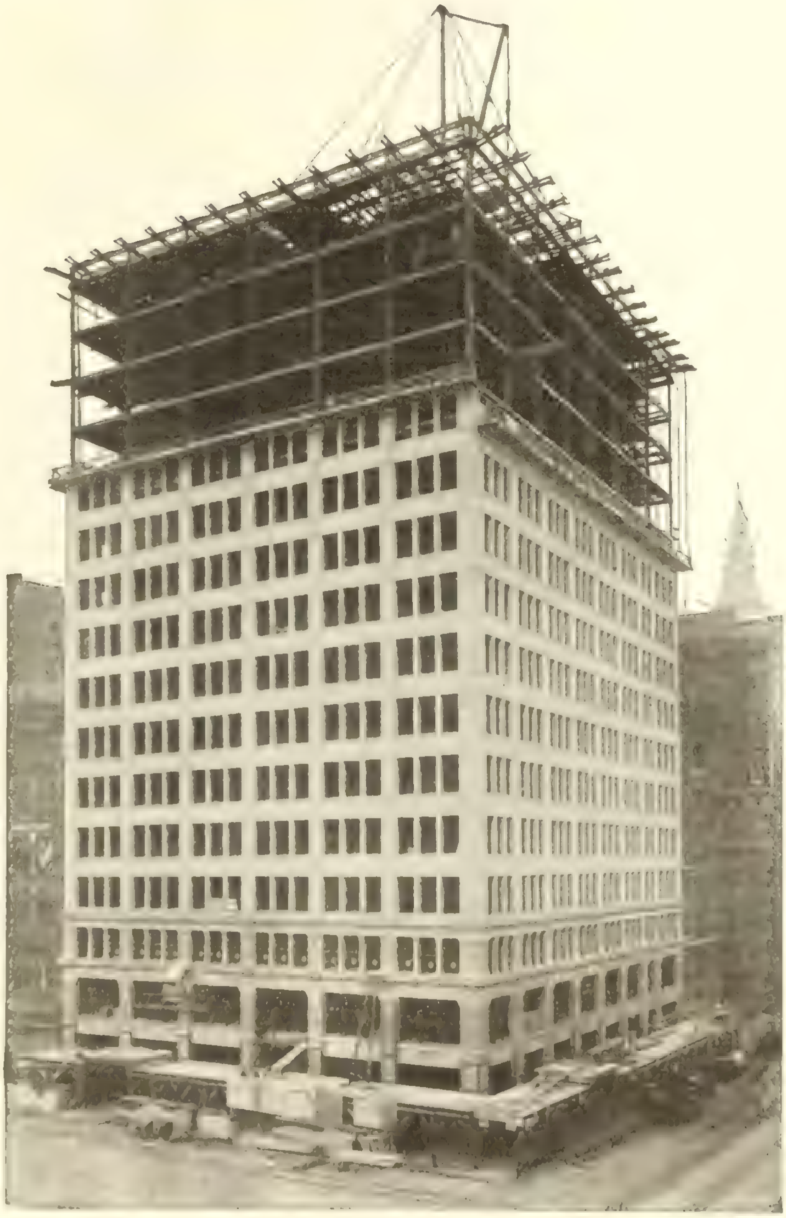
Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

You Can Lay Brick at any Storey

This Cut Shows

The Everett Building



All the BRICKWORK on this Building was Laid in 21 Days

Machines are Rented, Not Sold

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects Page
Keefer, [illegible] 92
Weeks, Arthur L 92

Architectural Iron Work
Canada Wire Goods Mfg. Co 76
Dennis Wire & Iron Works 81
Meadows Co., Geo. B 35

Air Compressors
Escher Wyss & Co 69

Air Valves, Automatic
Marsh, J. P. 84

Asphalt Plant
East Iron Machine Co. 77

Buckets
American Hoist & Derrick Co. 2
Sackett Screen & Shute Co 74

Belting
Federal Engineering & Supplies, Ltd 76

Blowers
Sturtevant Co., B. F. 27

Boilers
Case Threshing Machine Co. 83
Inglis, John 67
Jenckes Machine Co. 2
Leonard & Sons, E 77
Marsh & Henthorn 70
McDougall Caledonian Iron Works 69
Mussens Limited 4
Waterous Engine Works Co. 81

Brick Machinery and Supplies
Berg Mfg. Co.
Peerless Brick Machine Co.
Wert C. S.
Whitehead, John 28

Brick
American Enamelled Brick Co. 73
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 75
Milton Pressed Brick Co.
Port Credit Pressed Brick Co. 90
Toronto Pressed Brick Co. 72

Brickmaker's Supplies
Sackett Screen & Shute Co 74

Bridges (Steel)
Attica Bridge Co.
Canadian Bridge Co 88
Cleveland Bridge Co. 88
Dickson Bridge Works 74
Dominion Bridge Co 88
Hunter Bridge and Boiler Works 30
Phoenix Bridge and Iron Works 89
Pennsylvania Steel Co. 88

Cement
Alsen Portland Cement Co 78
Britnell & Co 84
Bremner, Alex 91
Canada Cement Co 3
McNally & Co., W. 89
Morrison & Co., T. A. 92
Rogers, Alfred Limited 9

Concrete Pipe
Dominion Concrete Co. 22
Lock Joint Pipe Co. 32

Cement Waterproofing
Ceresit Waterproofing Co. 35
Hercules Waterproofing Cement Co 29
Mansbendel, F. P. 31

Cranes, Travelling & Locomotive Page
American Hoist & Derrick Co. 2
Armstrong, H. J.
Brown Hoisting Machinery Co. 81
Males Co 64
Willis Shaw Machinery Co 64

Conduits
Conduits Co., Limited 91

Crushed Stone and Granite
Sand and Supplies 89

Concrete Mixers and Machinery
Canada Foundry Co 20
Cropp Concrete Machinery Co. 86
Famous Block Machine Co. 87
General Machinery Co. 72
Gould, Shapley & Muir 16
Hopkins & Co., F., H. 96
Jenckes Machine Co 2
London Concrete Machinery Co. 35
Milwaukee Mixer Co. 16
Mussens Limited 4
Morrison & Co., T. A 92
Steel and Radiation (Cement Gun) 82
Vining Bros. 77
Wettlaufer Bros. 10

Contractors' Plant
American Hoist & Derrick Co. 2
Acme Eqpt. & Engineering Co. 79
Beatty & Sons, M. 6
Hepburn, John T. 12
H. & E. Lifting Jack Co.
Hopkins & Co., F. H. 96
International Marine Signal Co. 8
Willis Shaw Machinery Co. 64
Meaford Wheelbarrow Co. 75
Marsh & Henthorn 70
Montreal Locomotive Works 33
Mussens Limited 4
Ritchie Contractors Supply Co.
Tiffin Wagon Co. 30
Troy Wagon Works 74

Crushers (Stone and Rock)
Berg Machinery Co.
Case Threshing Machine Co. 83
Hopkins & Co., F. H. 96
Jenckes Machine Co. 2
London Concrete Machinery Co. 33
Males Co 64
Mussens Limited 4
Morrison & Co., T. A. 92
Willis Shaw Machinery Co. 64

Corrugated Iron
Galt Art Metal Co. 73
Metallic Roofing Co. 71
Metal Shingle and Siding Co.
Ormsby, A. B., Limited 11
Roofers Supply Co. 91

Contractors
Bennett, Robt.
Foundation Co
Holmes, Fred.
McIlwraith, Jas. A. 92
Nadel & Adler 92
Wells & Gray

Coal Handling Apparatus
American Hoist & Derrick Co. 2
Down Draft Furnace Co. 79

Derricks and Derrick Fittings
American Hoist & Derrick Co. 2

Drills
Beatty & Sons M 6
Canadian Rand Co.

Drilling Contractors Page
Harvey, J. 93

Dredges
Beatty & Sons, M 6
Males Co. 64
Willis Shaw Machinery Co 64

Dry Kilns
Sturtevant Co., B. F. 27

Electrical Apparatus, Motors
Canada Ford Co. 36

Engines
Case Threshing Machine Co. 83
Canadian Boving Co. 28
Inglis, John 67
Jenckes Machine Co. 2
Leonard & Sons, E 77
Mussens Limited 4
Sturtevant Co., B. F. 27
Waterous Engine Works Co. 81

Engineers (Civil) and Mechanical
Barber & Young 92
Chipman & Power 92
Bowman & Connor 92
Farmer, John T. 92
Fuce, Edw. O. 92
Galt Engineering Co., John 92
Glaubitz, H. J. 92
Hancock, H. Syd. 92
Inglis, John 67
Kennedy, Jas. C. 92
Lea & Ferguson 92
Mace, T. Harry 92
Mitchell, C. H. 92
McRae, John B. 92
Moore & Scollan 92
Taylor, James 92

Exhaust Heads
Sturtevant Co., B. F. 27

Filters
American Water Softener Co. 34

Floor Scrapers
Hurley Machine Co. 30

Friction Clutches
Berg Machinery Co.

Field Instruments
Gurley, W. & L. E. 70

Fire Brick
Gibb, Alexander 85

Fire Apparatus
Morrison & Co T. A. 92
Seagrave, W E. 84

Fireproof Doors and Windows
Douglas Bros. 18
Mussens Limited 4
Ormsby, A. B. 11
Steel and Radiation 82

Gauges, Steam, etc.
Marsh, Jas. P. 84

Granite and Marble
Laurentian Granite Co. 87
Missisquoi Marble Co. 85
Smith Marble & Construction Co. 72

Glass Page
Chance Brothers & Co.
Consolidated Plate Glass Co. 95
Luxfer Prism Co.
Thompson & Co., B. & S. H.
Toronto Plate Glass Importing Co. 1

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. 77
Steel and Radiation 82

Hoisting Machinery
American Hoist & Derrick Co. 2
Beatty & Sons, M. 6
Canada Ford Co. 36
Inglis, John 67
Jenckes Machine Co. 2
Hopkins & Co., F. H. 96
London Gas Power Co. 77
Marsh & Henthorn 74
Mussens Limited 4
Sturtevant Co., B F. 27

High Pressure Pipe Lines
Escher Wyss & Co. 69

Hydrants
Canada Iron Corporation 91
Gartshore-Thomson Pipe Co. 90
Kerr Engine Co. 23

Interior Finish and Doors
Anglin, S. 78
Brennen & Sons, M. 27
Batts Limited
Canada Office & School Furniture Co
DeLaplante, Ltd. 85
Bryan Mfg. Co. 69
Eaton & Sons, J. R. 85
Georgian Bay Shook Mills 34
Rhodes Curry & Co.
Tillson Co.
Wilson Bros. 80

Locomotives
Montreal Locomotive Works 33

Lime
Christie, Henderson & Co. 84
Jamieson Lime Co.
Standard White Lime Co 79

Metal Lath
Galt Art Metal 73
Metallic Roofing Co. 71
Noble C. W. 78
Steel and Radiation 82

Meters
Hopkins & Co., F. H. 96
McDougall Caledonian Iron Works 69
Neptune Meter Co. 75

Paving and Paving Materials
Dominion Carbolineum Works 25
Metropolitan Paving Brick Co.
Ontario Asphalt Block Co. 78
Shawmut Paving Brick Co.
Silica Barytic Stone Co. of Ontario 93

(Continued on page 10)

M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows
Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

SIMPLE PERFECT

CLEAN WATER

For MANUFACTURERS or MUNICIPALITIES

Can be obtained by using the

"TORRENT" or "PULSOMETER"

FILTER

Complete information furnished on request

International Marine Signal Company Limited

OTTAWA, CANADA

GRAVITY PRESSURE

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Page
Albert Mfg. Co	
Britnell & Co	84
Calkins, H. W.	90

Pipe

American Spiral Pipe Works	70
Canadian Pipe Co	90
Dominion Wood Pipe Co	12
Dominion Concrete Co	22
Gartshore-Thomson Pipe Co.	90
Lock Joint Pipe Co	32
Munderloh & Co.	11
National Iron Works	91
Pacific Coast Pipe Co.	1
Pedlar People	20
Steel and Radiation	82

Plumbers' Supplies

Standard Ideal Co.	30

Power Engines

Inglis Co., John	67

Paints and Varnishes

Paterson Mfg. Co.	94

Pile Driving Machinery

American Hoist & Derrick Co.	2
Lincoln Construction Co.	86

Pumps and Pumping Machinery

American Well Works	14
Beatty & Sons, M.	6
Cook, A. D.	73
Escher Wyss & Co.	69
Hopkins & Co., F. H.	96
Inglis Co., John	67
Leonard & Sons, E	77
McDougall Caledonian Iron Works	69
Mussens Limited	4
Ontario Wind Engine & Pump Co.	86
Smart-Turner Machine Co.	1
Waterous Engine Works Co	81

Roofing Contractors

Schwoerer & Sons, A.	

Roofing Materials

	Page
Asbestos Mfg. Co.	24
Galt Art Metal Co.	73
Metallic Roofing Co.	71
Metal Shingle & Siding Co.	
Noble, Clarence W	78
Paterson Mfg. Co.	94
Philip Carey Co.	
Roofers Supply Co.	91
Standard Paint Co.	17

Railway Supplies

Gartshore, John J.	92
Hopkins & Co., F. H.	96
Mussens Limited	4

Reinforcements, Concrete and Steel

Ambursen Hydraulic Construct'n Co.	93
Canada Wire Goods Mfg. Co.	76
Concrete Form Engine Co.	71
Steel Co. of Canada	19
Steel & Radiation	82
Trussed Concrete Steel Co.	34
Turner, C. A. P.	80

Road Machinery

Case Threshing Machine Co.	83
Hamilton Machinery Co.	15
Morrison & Co., T. A	92
Mussens Limited	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co.	20
Hopkins & Co., F. H.	96
Mussens Limited	4
Males Co.	64
Willis Shaw Machinery Co.	64

Stone

Anderson, Geo.	18
Britnell & Co.	84
Brodie, Jas.	
Christie, Henderson & Co.	84
Consolidated Stone Co.	73
Contractors' Supply Co.	84
Corinthian Stone Co.	
Crushed Stone, Limited	77
Doolittle & Wilcox	70
Hagersville Contracting Co.	11
Laurentian Granite Co.	87
McMillan & Son, R.	
Morrison & Co., T. A.	92

Stone

	Page
Myers, Oakley	77
Roman Stone Co	13
Sackville Freestone Co.	8
Sand & Supplies	89
Thames Quarry Co.	86

Sand and Gravel

Rogers Supply Co.	31
Sand & Supplies	89

Steam Apparatus

Sturtevant Co., B. F.	27

Submarine Diver

Rouleau, Joseph N.	92

Structural Iron and Steel

Buffalo Steel Co.	
Dominion Bridge Co.	88
Steel Co. of Canada	19
Pennsylvania Steel Co.	88
Phoenix Bridge & Iron Works	89
Reid & Brown	87
Salter, W. H.	89
Steel & Radiation	82

Sewer Pipe

Britnell & Co	76
Canada Iron Corporation	90
Dominion Sewer Pipe Co.	21
Gartshore Thomson Pipe Co.	90
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	32
National Iron Works	91
Ontario Sewer Pipe Co.	21
Standard Drain Pipe Co.	21

Stationary and Power Engines

Case Threshing Machine Co	83

Slate

Roofers Supply Co.	91

Steel Shingles and Ceilings

Galt Art Metal Co.	73

Smoke Stacks

Leonard & Son, E.	77

Tents

Woods Limited	83

Safes and Vaults

Taylor, J & J	70

Testing and Inspection Bureau

	Page
Hunt & Co., Robt. W.	77

Tiles

Smith Marble & Construction Co.,	72

Tanks and Stand Pipes

Berg Machinery Co.	
Inglis, John	67
Jenckes Machine Co.	2
Leonard & Sons, E.	77
Marsh & Henthorn	70
McDougall Caledonian Iron Works	69
Ontario Wind Engine & Pump Co.	86

Trade Journals

Castellanos A. W.	86

Valves

Canada Iron Corporation	91
Gartshore-Thomson Pipe Co.	90
Kerr Engine Co.	23
Marsh & Co, Jas.	84
Standard Fitting & Valve Co.	84

Ventilating and Heating Apparatus

Gardiner & Gaskill	
Sturtevant Co., B. F.	27

Water Softeners and Filters

Berg Machinery Co.	
American Water Softener	34

Wire Rope

Greening Wire Co., B.	87
Smith, Thos. & Wm.	
Steel Co. of Canada	23

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	76
Crescent Wire Iron Works	93
Sackett Screen & Shute Co	74
Steel and Radiation	82

Water Wheels

McDougall Caledonian Iron Works	69
Canadian Boving Co.	28

Water Turbines

Escher Wyss & Co.	69

Wheelbarrows

Sackett Screen & Shute Co.	74

DON'T BUY a Mixer before you see this one

One of the advantages this Mixer has over other makes is the small power required to operate it and the surprisingly low maintenance cost. Remember when you buy a Mixer you should consider the workmanship and material in the machine as well as the cost.

Wettlaufer Bros.
178 Spadina Ave., Toronto

A. R. Williams Machinery Company, 15 Dock St., St. John, N.B.
W. E. Ransome, Moosejaw, Sask.

MUNDERLOH & Co Ld.
MONTREAL.

Seamless Steel Traction and Lighting Poles.

Mannesmann Seamless Steel Pipes. For Gas & Water Mains.

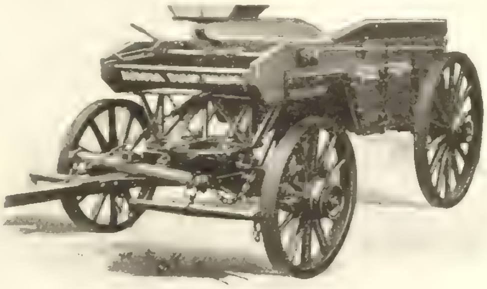
In Lengths up to 40 Feet.
An Improvement on Cast Iron.
All Pipes Tested 75 Atmospheres Before Leaving Works.

Write us for Illustrated Booklet
Send us your Enquiries.

We are Sole Agents in Canada for—
MANNESMANN TUBES.
For all Purposes.

THE STRENGTH OF OAK WITH 40 PER CENT SAVING IN WEIGHT

That's the saving effected by constructing the bed of selected Washington Fir, and its just one of the many reasons why lightest weight is combined with greatest strength in the



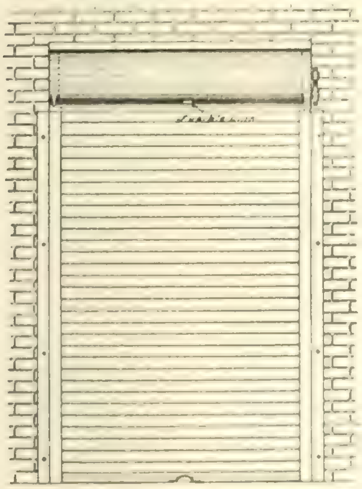
"Aurora" Dump Waggon

Built low for easy loading, coupled short for lightest draft only 7 feet 4 inch wheel base.
Chains entirely outside of bed, direct pull of chain on doors and length of chains adjustable.
Slotted hinges on doors give vertical movement, preventing installing team on dump.
Study its sturdy construction—its mechanical, labor-saving and dependable qualities. Catalog for the asking.

Western Wheeled Scraper Co.
Earth and Stone Handling Machinery — Aurora, Ill.

The Most Economical Door Made as Regards Space

Our Rolling Steel Doors take up but one foot above the opening and 2½ inches on either side. They have **proved themselves in actual fires** in Canadian Cities. Can be left in any position and will close of themselves when struck by fire. They stand any amount of wear and tear and are very easily operated. — Specify our Patented Rolling Steel Door for any opening where a Fireproof Door is needed and space is limited.



Experts in Fireproof Windows and Doors

A. B. Ormsby, Limited

Factories { Corner Queen & George Streets - TORONTO
677-81 Notre Dame Avenue W., WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

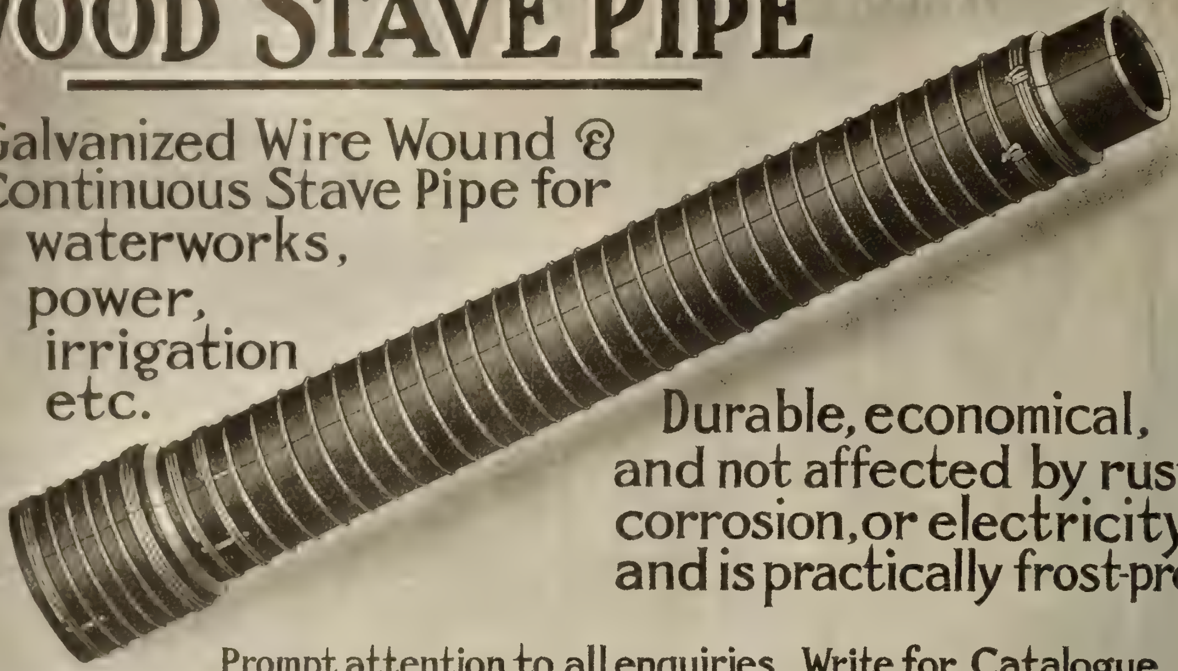
SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Have you any use for a Derrick?

There are large plans under way. Large contracts are being placed. In all directions there is bustle and activity. Everything points to an unusually busy season for construction work of all kinds. But what about equipment?

John T. Hepburn

Scotch Derricks

are in use by all leading contractors in all parts of the country. They are designed and built for hard work, combining safety and high efficiency, with low operating cost. Being made in standard sizes, any part can be replaced at short notice. They may be operated by hand or power—are fitted with single and double purchase gears—powerful band brake—and safety locking device that prevents boom from falling.

We are busy now. We shall be busier in two or three weeks
Better place your order to-day to secure early delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company

Limited

Head Office: 504-5 Temple Building, TORONTO

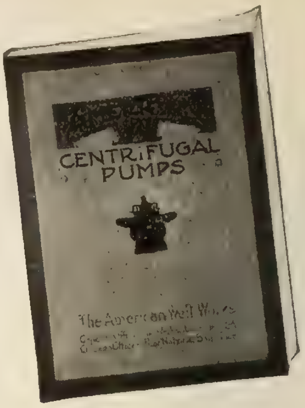
E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

Why "American" Centrifugals

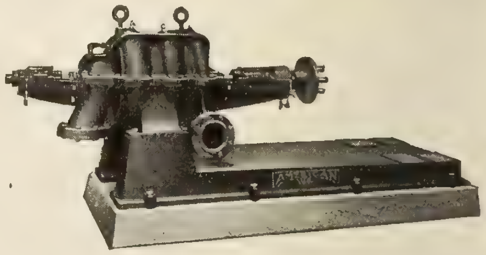
Are Most Economical in the Widest Range of Pumping Conditions.



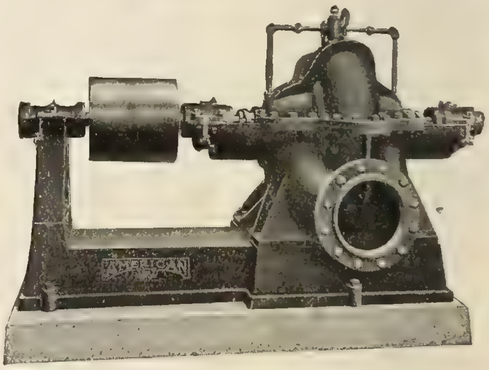
The reason why "American" Centrifugals are unequaled for economy is that they represent the highest development of the most modern type of pump and there are the best of reasons for this higher development.

Instead of building a single type of centrifugal and recommending it for every purpose "American" centrifugals are built in over fifty distinct types and every size of every type is carefully tested in our own complete hydraulical laboratory and its efficiency proved before it is permitted to leave our works.

It must meet our standard of efficiency before it is allowed to leave our works and that is what is making the American trademark famous in pumping machinery.



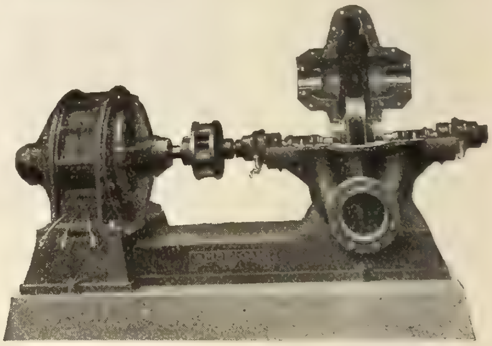
AMERICAN
AWW



"American" centrifugals attain up to 80 per cent. mechanical efficiencies and many of our specially designed pumps, installed according to our own specifications, show much higher efficiencies, enabling them to operate against high heads. We have many single stage centrifugals installed operating on over 200 feet heads.

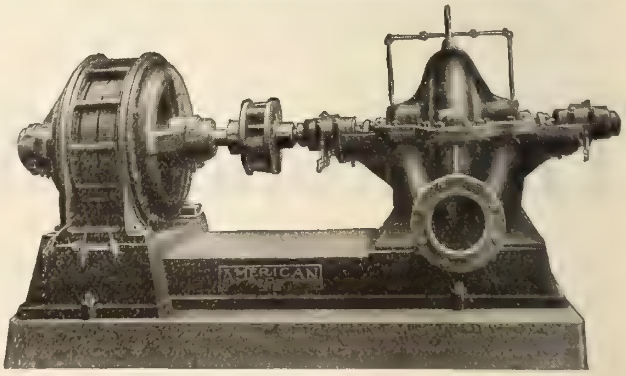
The low first cost of "American" centrifugals as compared with old style plunger pumps, combined with their high efficiencies, low cost for attendance and small cost for repairs make them **far more economical** than any other type of pump in nearly all conditions where **all costs are considered.**

Greatest economy in the end is the claim we make for "American" centrifugals and we are ready to prove that claim.



If you are interested in irrigation, write for our booklet, "Irrigation by Pumping" Bulletin No. 118.

Our General Centrifugal Pump Catalog No. 117 is the most complete ever issued. Write for it today.



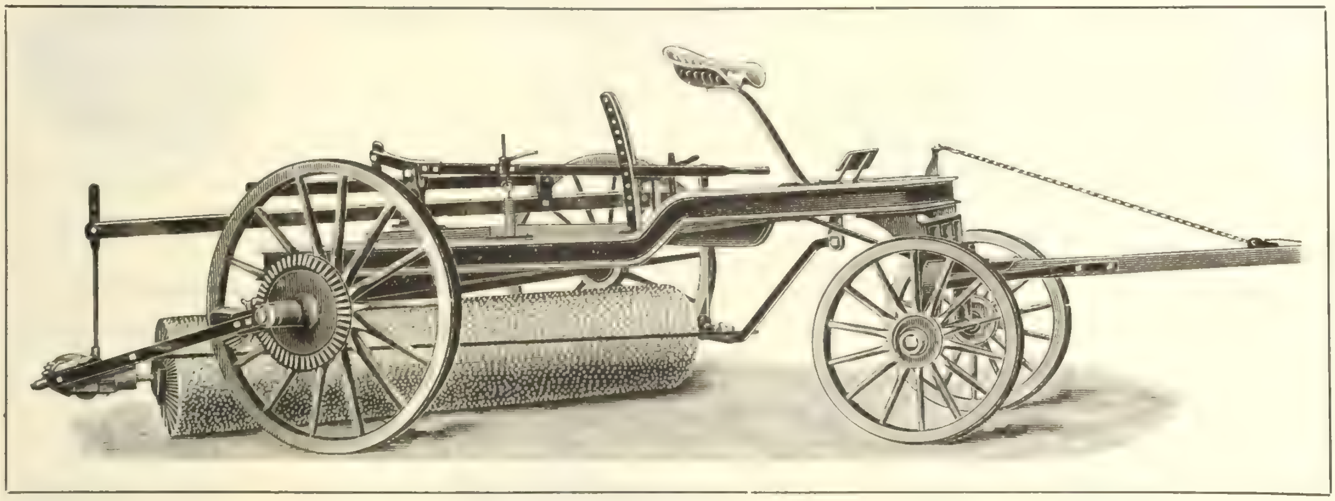
The American Well Works

General Office and Works: Aurora, Ill., U. S. A.
Chicago Office: First National Bank Building
Canadian Sales Agency:
234 Craig Street West, Montreal
441 Seymour Street Vancouver, B.C.

Two Big Leaders

"Keystone" Street Sweepers
and
"Champion" Street Sprinklers

THESE TWO SPECIALTIES are without a doubt two of the best examples of the quality maintained by the goods of this company. They are in no sense experiments, being in use from one end of Canada to the other with unfailing satisfaction to their owners.



We Claim for the "CHAMPION" SWEEPER

1. Perfect work on uneven road surfaces.
2. Light draft.
3. No contact between machinery parts and sweepings.
4. Steel fibre brush—thoroughly effective.
5. Power applied at heavy end of broom.
6. Adaptability to any class of roadway.

THE SPRINKLER This splendid sprinkler has every improvement of proven value. It is made in all sizes and styles to suit every requirement, but for ordinary use we recommend the horizontal steel tank with wood ends, platform spring or reach gear sprinkler, with steel frame and vertical spray sprinkling attachments. This style is made in four sizes, viz: 1000, 750, 600 and 500 gallon.

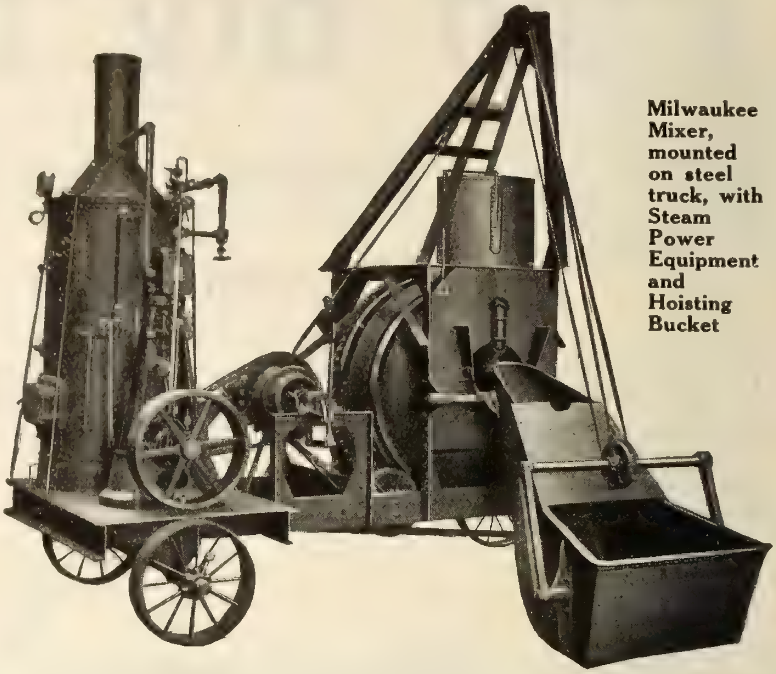
Send for Catalogue giving full description of
these and the "Champion" Road Machinery.

The American Road Machine Company of Canada, Limited, Goderich, Ont.

The Hamilton Machinery Company, Ltd.
Hamilton, Ont.
Also Canadian Distributors for the famous "Interstate" Automobiles

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

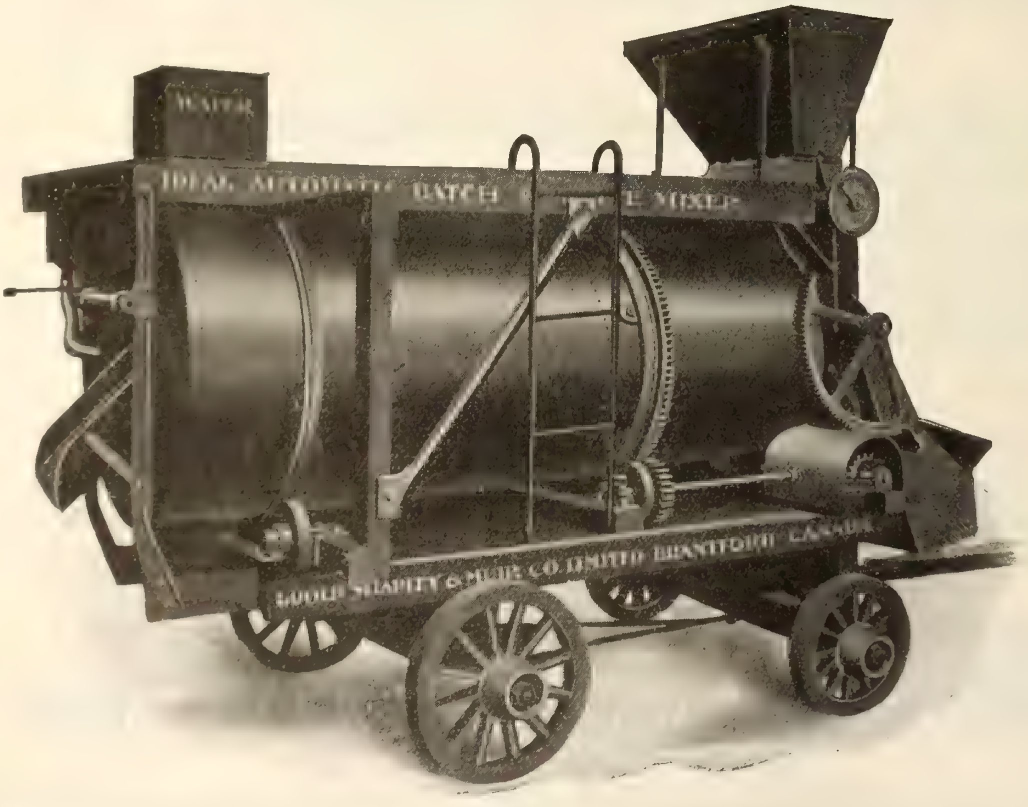
MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES:

The Stewart Machinery Co., Winnipeg, Man. **C. W. Stancliffe & Co., Vancouver, B. C.**
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS


WATER
IDEAL AUTOMATIC BATCH ... E MIXER
GOOLD SHAPLEY & MUIR CO LIMITED BRANTFORD CANADA

Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY
& MUIR CO. LTD.
Brantford, Canada

Skilled Labor is Unnecessary in Laying

RU-BER-OID ROOFING

Trade Mark Registered

ONE of the big advantages of **RU-BER-OID** from the Contractor's point of view is the fact that it is so easily laid. No skilled labor is required to make an absolutely tight, one-piece roof. Ordinary laborers, with a good foreman, can cover a roof with **RU-BER-OID** not only well, but very quickly.

Our new *Sherardized Roofing Nails,* with their broad heads, make caps unnecessary, so that the work can be done considerably faster.

Besides making a first-class roofing in itself, **RU-BER-OID** answers perfectly over concrete and under metal roofs. It was used, for instance, under the copper roof of the new Chateau Laurier Hotel at Ottawa. We have devised a method of laying **RUB-ER-OID** over concrete which is simple and effective.

For temporary structures one-ply **RU-BER-OID** makes the very best covering for both roof and walls. It is inexpensive, quickly applied, and absolutely weather proof.

Write for booklets, prices and full information about **RU-BER-OID** and the two methods of laying it—plain and in tile effect.

The Standard Paint Co. of Canada, Limited

286 St. James St., Montreal
105 Tenth Ave. E. Calgary

179 Bannatyne Ave. E., Winnipeg
25 Pender Street W., Vancouver

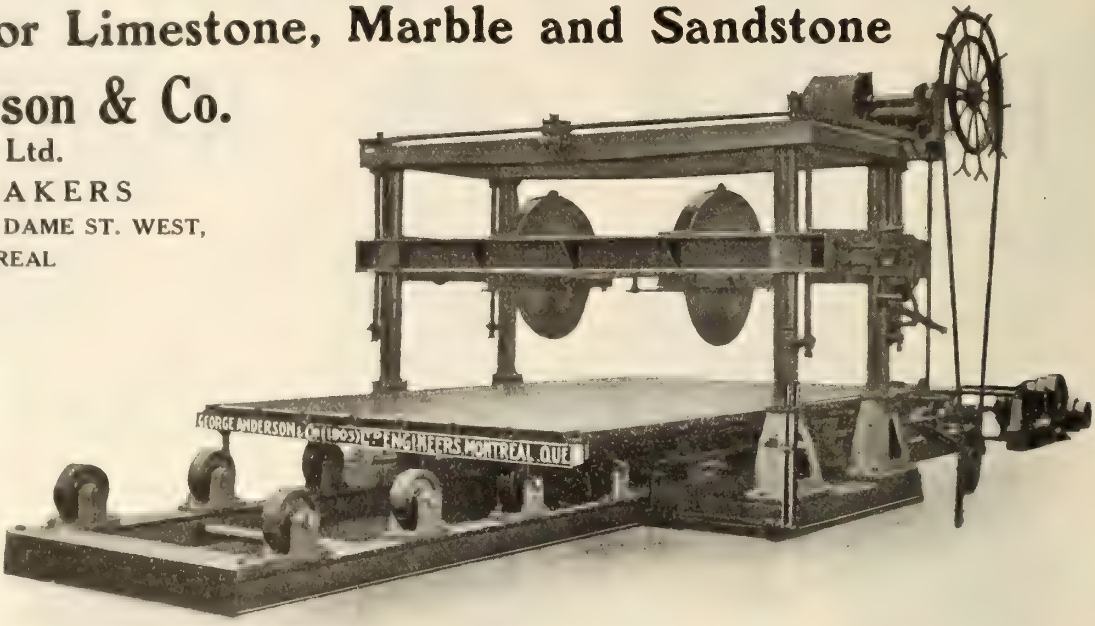
Circular Diamond Saws

For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

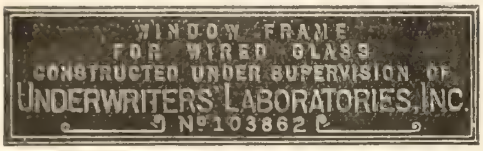
BRANCH OFFICE & WORKS
London, England, 82 Victoria St. S. W., Newark N.J. U.S.A. 420-422 Ogden St., Montreal Works, 157 Craig St. West, Head Works, Carnoustie, Scotland

MAKERS OF
GANGS, PLANERS, MARBLE DRESSERS DERRICKS, AND ELECTRIC TRAVELING CRANES UP TO 50 TONS, QUARRY MACHINERY, GAS ENGINES AND PRODUCER PLANTS 10 H.P. TO 150 H.P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 **SINGLE AND DOUBLE TABLES**

About 50 of the above Machines at work in Canada


WINDOW FRAME
FOR WIRED GLASS
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES, INC.
No 103862

Underwriters' Label.

The Underwriter's Test

There is absolutely no question as to the comparative value of our Metal Fireproof Windows over the old-fashioned metal or metal-covered wood shutters. Repeated tests have proved conclusively the superiority of metal fireproof windows.

The ideal fireproof windows should be constructed to meet the following requirements:

It must be absolutely fireproof.

It must have hollow sheet metal frames and sash, fitted with wire glass.

It must be riveted and locked together so that it will not fall apart when exposed to intense heat, solder only being used to finish the seams and mitres.

The Douglas Window has stood the National Board of Fire Underwriters' test to which it has been subjected at their Laboratory at Chicago, and is endorsed by them.

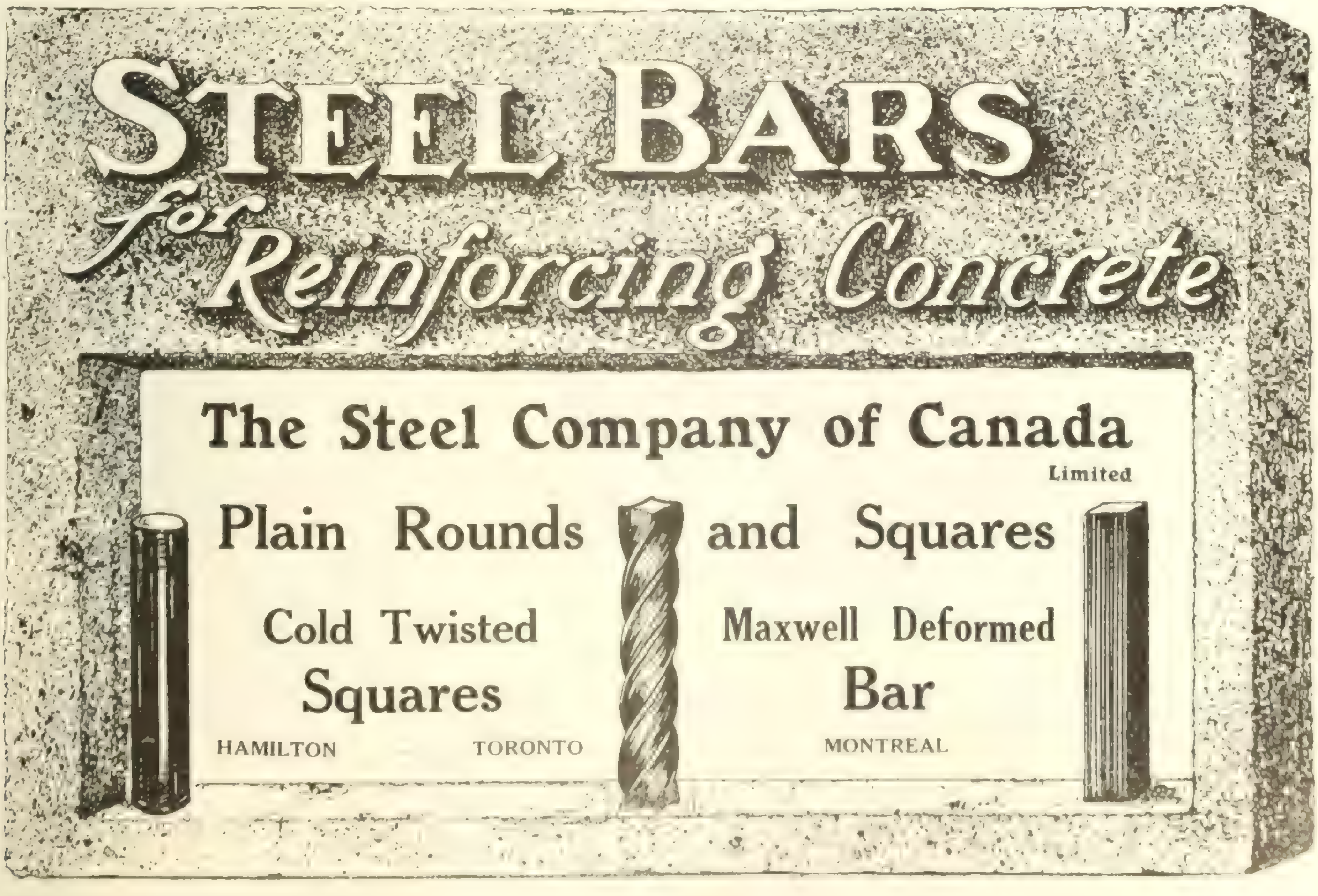
DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

The
Tillson Company
Limited
Wholesale Manufacturers of

Sash, Doors, Mouldings, Frames for Doors and Windows, Columns, Interior Finish of Every Description, Porch Work, Gable Ornaments, Brackets, Head Blocks, Corner Blocks, Base Blocks, Door and Window Screens, Etc.

Millwork of all kinds

Tillsonburg,
Ontario



STEEL BARS
for Reinforcing Concrete

The Steel Company of Canada
Limited

Plain Rounds and Squares

Cold Twisted Squares

Maxwell Deformed Bar

HAMILTON TORONTO MONTREAL

J. H. NEW, PRESIDENT RYLAND H. NEW, VICE-PRESIDENT

HOW MUCH WILL IT COST?

It is not so much the matter of first cost that you should interest those intending to instal a Sewage System but the big question that should be most sincerely considered is what is the most economical material to use so as to be assured of a premanent job.

Hamilton Vitrified Salt Glazed Sewer Pipe

has solved this question for others during the past half Century. Is there any good reason why we cannot help you?

We again say that VITRIFIED SEWER PIPE is the only material that insures you of a permanent job at the minimum of cost.

WRITE, PHONE OR WIRE FOR PRICES

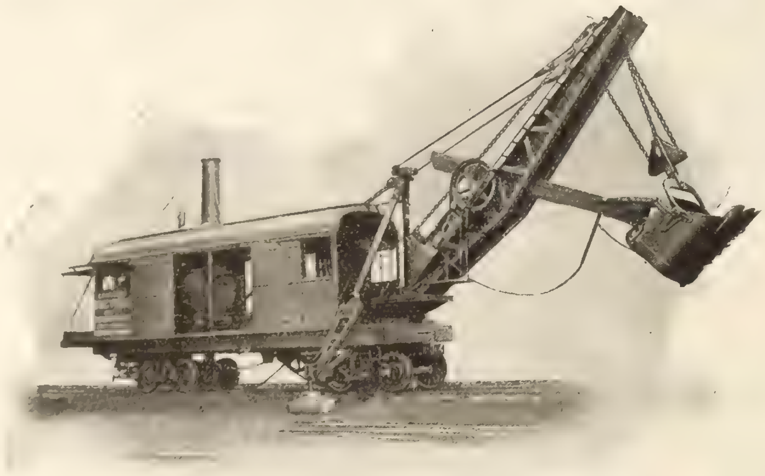
Established 1860

The Hamilton & Toronto Sewer Pipe Co.

HAMILTON and TORONTO Limited

Long Distance Phones:—Toronto, Main 990, College 1558. Hamilton, 3990, 3991, 3432.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert Pipes

We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

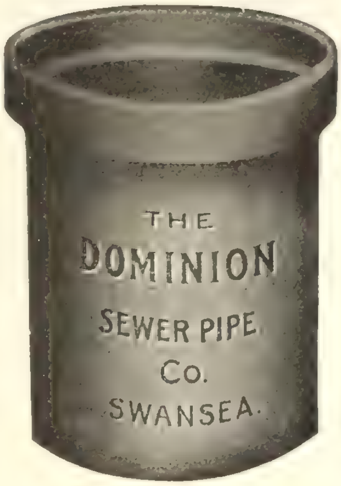
Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

- **Chimney Tops**
- **Flue Linings**
- **Wall Coping**
- **Culvert Pipe**
- **Inverts**

Telephone (Toronto Connection)
Park 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) . Limited
SWANSEA (near Toronto)

Large Contracts are our Specialty

The Pipe that makes
THE SEWER SURE

ROUND Pipe and SQUARE Dealings

WE carry a stock in all sizes, 4 inch to 24 inch, large enough to keep any job going regardless of the press of business in one-car orders.

That means money to you

No waiting on pipe when you place your orders for "**MIMICO**" goods, and it is also $99\frac{9}{10}\%$ right when it arrives.

It Saves You Worry
Worry Shortens Life

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422, Evenings Park 3888 and 3889

Railway Engineers and Contractors

Timber culverts rot, clay pipe culverts break from frost or weight, metallic culverts rust and are woefully dear, CONCRETE CULVERTS LAST FOREVER and the price is relatively low.

The only absolutely **durable and frost-proof** culvert pipe is

36″ Section

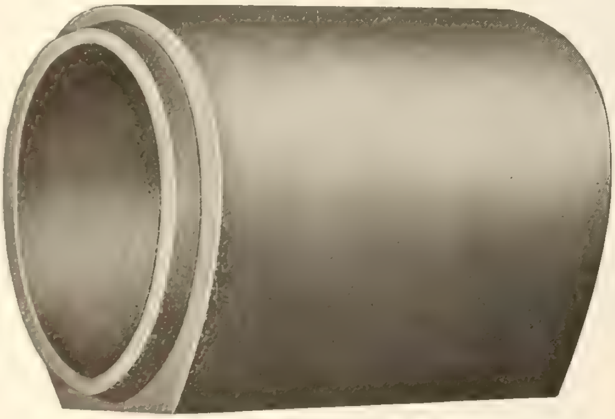
REINFORCED CONCRETE

of **first quality.** The prime requisites of first quality concrete are **good raw material, proper proportions** and **scientifically correct methods.**

We possess all these in the highest degree. Our years of experience, our facilities and our raw material enable us to make **good concrete** and make it **always good.**

Nowadays the railway engineer must get results in **permanency** as well as in other matters. The contractor too must get results if he is to stay in the game. A very important result to him is the **economy** of buying material that **holds out,** that can be handled with **facility,** and that can be procured **promptly** and at a **reasonable price.**

Don't imperil your interests by using non-durable material, or by trusting to the random hits and misses of a novice when you can buy **durable, mature,** and **guaranteed concrete pipe,** from a long-established and reputable firm.



30 Section

Mature Stock

Prompt Shipment

Quality Guaranteed

No Loss from Breakage

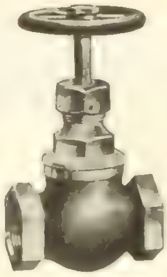
Low Prices

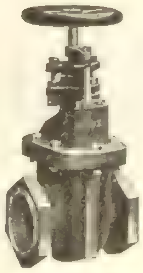
WRITE FOR CATALOGUE AND PRICES

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO

Water Crane and Hydrant Combination





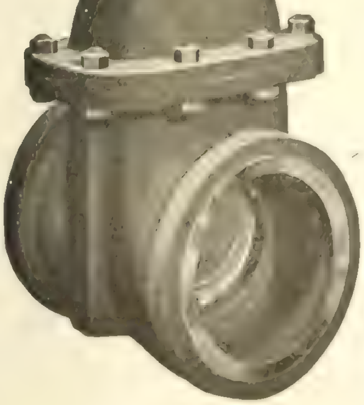
KERR VALVES

For City Waterworks

We manufacture valves and hydrants for every branch of city and town waterworks. If you are in charge of any waterworks' extensions, be sure you find out about "Kerr" goods before you prepare your specifications; then specify "Kerr."

Indicator for Fire Protection Valve

Have you copy of our Catalogue?



THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

The Only Everlasting Roof

Asbestos Cement Slate

"This is practically indestructible by atmospheric influences, so that maintenance expenses for roofs covered with this material are excluded.

For a period of three months the asbestos cement slate absorbs, and assimilates moisture in exactly the same ratio as the best natural slate. After that time the absorption ceases altogether, and the material becomes impervious, indestructable, and as hard as iron.

The stringy asbestos fibres, which, by characteristic peculiarity of a patented process, are embedded cross-wise in the cement paste. This has exactly the same effect as concrete-steel constructions. They impart to the asbestos slate extremely high physical strength, indifference to blow or shock, and great elasticity. These properties are of the same importance to conveyance, and the laying of the asbestos slates, as they are to their durability and length of service.

The insulating capability of asbestos when brought to bear either upon heat or cold, imparts an increased importance to asbestos cement slate, not only in its suitability for the tropics—where it is commonly used as a substitute for corrugated iron; but also for the continental climate, where it is economically used in workshops, in dwelling rooms, and particularly over garrets, which, with other roof coverings, would have to remain unoccupied.

The fireproof quality of asbestos renders asbestos cement slate a thoroughly fireproof material, which, owing to its strictly scientific manufacture, cannot become either cracked, rent, or scaled in case of fire."

The above is an extract, word for word, from a government report of the Canada Department of Mines.

We are the only manufacturers of asbestos shingles or slates in the Dominion of Canada."

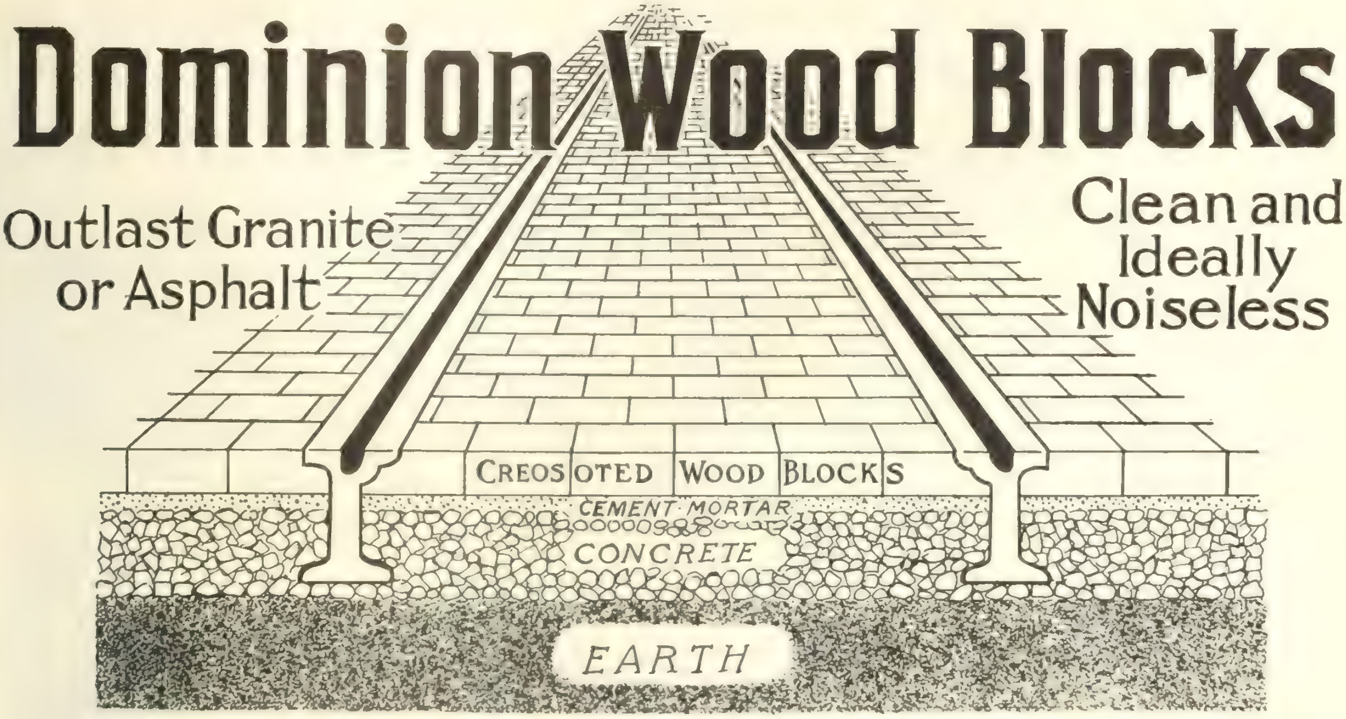
Specify

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P.Q.
Factory at Lachine, P.Q.

Dominion Wood Blocks



Dominion Wood Blocks

make the most durable pavement for all classes of service, from the lighest wear of boulevard vehicles to the grinding of the heaviest trucking traffic. It is the one pavement that won't need the annual attention of the repair gang and will pass out of reserve in perfect condition.

Don't put your money in a pavement that will need patching before the final payment is made on the assessment.

The Dominion Creosoting Co., Ltd.

SUCCESSORS TO

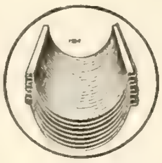
Dominion Carbolineum Works
Vancouver, B.C.
LIMITED

PEDLAR NESTABLE CORRUGATED GALVANIZED CULVERT

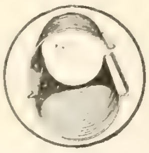
Is the Strongest, Most Practical, Durable and Easiest Laid Culvert Made

YOU ought to show this advertisement to your township reeve or warden. Get him to write for the free book about Pedlar Culverts, or write for it yourself and tell him about this new Culvert—the quickest, most economical, strongest for any use any culvert can serve.

THESE culverts of mine are a great thing for the farming world. They not only make good roads possible, but they serve the farmer in many other ways. And they are so simply laid. They come nested like this.



This compactness saves freight and makes it easy to handle them. You put the sections together like this:



Then you clamp the flanges together like this:

And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

G. H. Pedlar

See How It Saves Farmers' Money, Betters Roads, Lowers Taxes

This picture is from a photo of a washout fourteen feet deep in the Township of Darlington, caused by use of cement tile for drainage purposes. The township authorities have replaced that with Pedlar Perfect Culvert, forty feet in length by three feet in diameter; strongest, easiest laid and most durable they could get.

This picture of the Pedlar Perfect Culvert assembled and ready to lower into place, shows the immense strength and rigidity of these Culverts. Though forty feet long with a bearing of only a few feet at the centre it does not give one-sixteenth of an inch. See how easily Pedlar Culvert can be lowered into place. No skill needed.

Here you see the Pedlar Culvert doing its work of drainage twenty-five minutes after being put in place. It would have taken three times as long and cost three times as much to have installed any other type of culvert. Yet this Pedlar Culvert will last far longer and give no further trouble of any kind.

This view shows the Pedlar Culvert after the fill-in was completed. The Culvert has to carry a dead weight of several hundred tons of earth, as well as the live weight of traffic passing overhead. But that can't strain Pedlar Culvert, which will neither give nor spring. It stands what no other Culvert can.

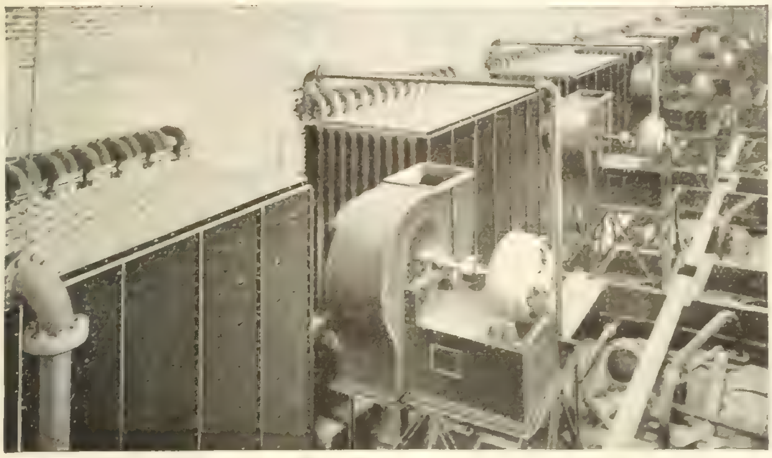
Write for My FREE Book No. "23" and Sample

and get a correct idea of what makes a good Culvert. Learn how Pedlar Culvert can be used on your farm.

The PEDLAR PEOPLE of Oshawa

411 *Address nearest place*

HALIFAX, 16 Prince St.
ST. JOHN, N.B., 42-46 Prince Wm. St.
MONTREAL, 321-3 Craig St. W
LONDON, 86 King St.
OTTAWA, 423 Sussex St.
TORONTO, 111-3 Bay St.
CHATHAM, 200 King St. W.
QUEBEC, 127 Rue de Pond
REGINA, 1901 Railway St. S.
WINNIPEG, 76 Lombard St.
PORT ARTHUR, 45 Cumberland St.
CALGARY, 1112 First St. W.
VICTORIA, 434 Kingston St.
VANCOUVER, 821 Powell St.



At the Power Plant of The Denver Tramway Co.

are installed

6 **Sturtevant** Metal-to-Metal Joint Economizers. *No Gaskets.* Capacity 300 Lbs. Pressure.

6 **Sturtevant** Multivane Induced Draft Fans direct connected to

6 **Sturtevant** Commutating Motors.

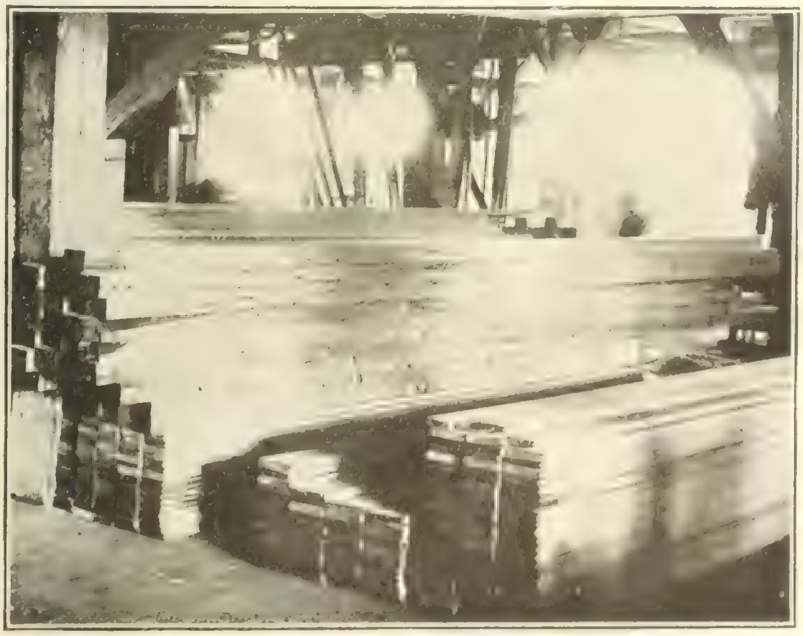
All working in connection with 6 Sterling Boilers 4200 B. H. P.

"Economical Fire Room Methods," by F. R. Low, Editor of Power; Sturtevant Bulletin No. 187-N describes the operation and equipment of one of the most efficient and economical power plants in the world, The Wood Worsted Mills, Lawrence, Mass.; told in a most interesting manner by one of the foremost technical writers in this country. It is yours for the asking.

B. F. Sturtevant Co. HYDE PARK, MASS.

853

Eadie-Douglas, Limited, Montreal Polson Iron Works, Limited, Toronto



THE INTERIOR OF OUR MILL.

Timbers

The illustration shows our mill and also some long timbers. We are equipped to supply you with construction timbers of any length in White Pine, Georgia Pine or Hemlock. Our facilities for marketing this material are unsurpassed.

TRY US ON YOUR NEXT ORDER

The M. Brennen & Sons Mfg. Co., Ltd.

HAMILTON - ONTARIO

John Whitehead & Co.

LIMITED

Albert Work: PRESTON, ENGLAND

Makers of

Reliable

Efficient

Tile and Pipe Machinery, and

CLAY WORKING PLANT

for all classes of Clays and Shales.

INQUIRIES SOLICITED. CATALOGUES POST FREE.

Established over 75 years. TELEGRAMS: Brictile, Preston

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

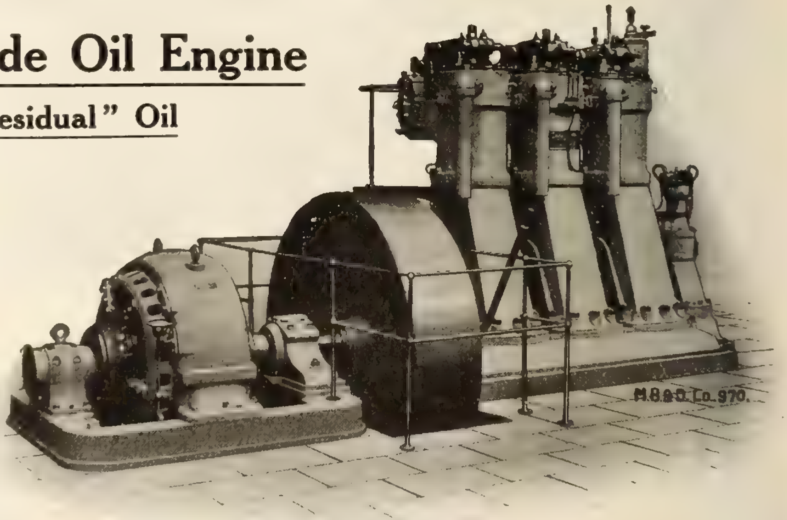
The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear
No Producer
No Chimney

No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdowns
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses



HIGH SPEED SLOW SPEED

35 to 1000 B. H. P.

A Chat on Sales

ONE of the important things that you are interested in is information that will enable you to sell more at a lower cost in a better market.

MACLEAN DAILY REPORTS are organized and operated on a plan entirely new in Canada—a plan that will supply you with fresh, dependable, accurate news—telling you DAILY where there are possible buyers, what they want and when they want it.

This information is obtained by our own staff of reporters and correspondents, by personal interview with people in authority.

Our Service tells you about the proposed operation long before the other man knows. It enables you to select from the whole field those opportunities that promise the most profit and which you can handle to the best advantage. It enables you to follow up all sales possibilities persistently and aggressively.

Ask us to tell you what it will cost to keep you informed every day on all the live sales possibilities relating to your business. Ask us to send you specimen reports.

MacLean Daily Reports Limited

220 King St. West
TORONTO ONTARIO

Hercules Waterproofing Compound

Manufactured in
Powder and Liquid Forms
by

The Hercules Waterproof Cement Company

BUFFALO, N. Y., U. S. A.

Distributors in:
Niagara Falls, St. Catharines, Welland, Hamilton, Toronto, Ottawa and Montreal

ABSOLUTELY the only Waterproofing Product on the market giving Impermeability with Increased Tensile and Compression Strength to Concrete.

The report of Mr. Peter Gillespie, Lecturer of Applied Mechanics, University of Toronto, shows by the use of 2% Hercules Compound thoroughly mixed with dry Portland Cement before the addition of sand or water, an average Increase in Tensile Strength of over 10% together with Absolute Impermeability, as compared with the same mix of the Portland Cement without the incorporation of Hercules Compound.

While this increase as shown in Mr. Gillespie's laboratory test is very considerable and makes Hercules a factor in all concrete work,—the result secured by Engineers on cubes containing a 1-3-5 mix, and made after the manner of the construction work for which they were tested, has shown an increase of from 18 to 25 , together with Absolute Impermeability. CAN YOU BEAT THIS?

Hercules Waterproofing Compound is not an experiment. We can furnish photographs showing work and furnish letters from Engineers, that positively places Hercules Waterproofing and Strengthening Compound in a class by itself.

Circulars, Catalogues and General Information cheerfully furnished upon request.

Tiffin Flushers, Sprinklers, Dump Wagons

Garbage, Street Cleaning Carts and Municipal Devices

The Most Complete and Perfect Line Made in the United States

THE TIFFIN WAGON CO.
Tiffin, Ohio

Rock Channelers

For Sale

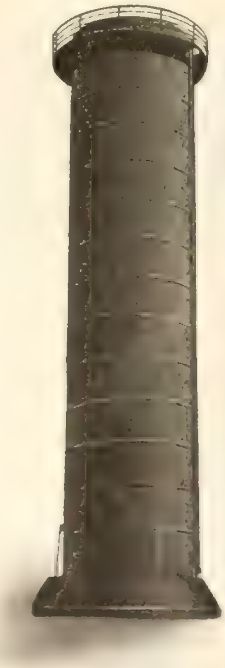
We offer for immediate delivery F. O. B. cars Niagara Falls, Ontario:

Two Sullivan "Z" Channeling machines, latest type, to be run with air, Machines equipped with air reheaters, 30 feet sectional track, and all tools. Full outfit of "Z" or gang bits to cut 12 feet, and stock of repair parts.

These are swivel head machines and have been used only a few months; are in perfect order and can be seen in operation on our work, Queen Victoria Park, Niagara Falls, Canada.

For Photos and Full Information Address:—

Purchasing Agent,
The Ontario Power Company
of Niagara Falls
NIAGARA FALLS, ONTARIO.



STAND PIPES
and
Elevated Tanks

Highway Bridge and Concrete Work.

Boilers of all kinds.

Steel Piling.

Over a quarter of a century's experience in the manufacture of these lines.

Get our figures before closing your contracts

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

The Contractor's "Money Saver"

Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment — Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto—write us **to-day.**

MACHINE PAYS FOR ITSELF IN A FEW DAYS.

"Little Giant Floor Scraper"

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

Tel. Main 4155

We are now in the

Sand Business

Our Wagons hold 2½ Yards

High Grade Sand and Prompt Delivery

Rogers Supply Co.

28 King St. West,

Toronto

WHY IS KITON

Superior to Ordinary Tar?

BECAUSE:

KITON is free from inflamable organic solvents, and therefor far less combustible than tar.

KITON is soluble in water, and in this diluted form can be applied to any surface, whether rough or smooth, hot or cold, wet or dry, as easily as paint. As soon as once dry, **KITON**, like Tar, is absolutely insoluble in water and permanent. Hence its use for

Weather and Waterproofing

KITON will cover a larger area than the same weight of tar'

KITON will do the work better and quicker.

KITON is so easily handled.

KITON needs neither fire nor tarkettle.

KITON will never run, if exposed to the heat of the sun.

KITON will stick positively to any surface.

KITON will take any whitewash, or a finish coat of plaster or cement.

KITON can be coloured.

KITON has none of the drawbacks of tar, but has all of its advantages, and then some.

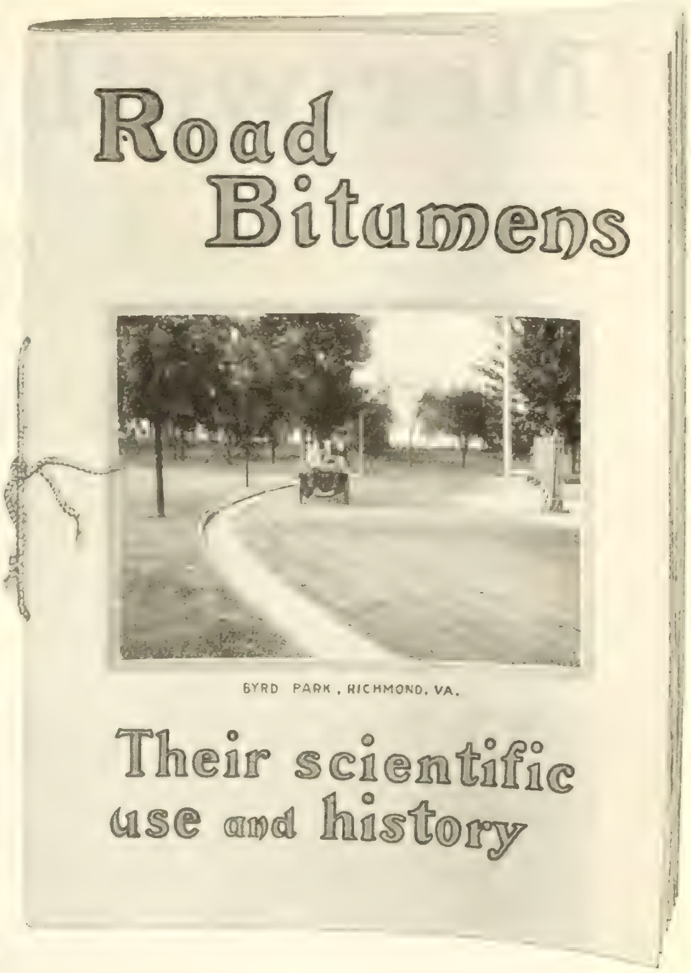
KITON is cheaper in the long run.

ASK FOR PRICES AND SAMPLE !

F. P. Mansbendel

General Distributor for Canada

212 Huron St., - Toronto, Ont.



Road Bitumens

BYRD PARK, RICHMOND, VA.

Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a phamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement Company

First National Bank Building

CINCINNATI

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

Manufacturing 60 inch pipe for the Low Level Interceptor, Toronto.

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

Write for Illustrated Catalog

ONTARIO AND QUEBEC
Francis Hankin & Co.
Montreal & Toronto

MANITOBA, SASKATCHEWAN AND ALBERTA
F. H. McGavin Company Limited
Winnipeg

BRITISH COLUMBIA
Pacific Lock Joint Pipe Co.
Seattle, Washington

Class 45-16 2½ Atlantic Shovel built for Edgar S. & L. W. Reade, Contractors
At work on the construction of the Canadian Light and Power Company's Canal, at Valleyfield, Quebec, Canada

BUILT BY
MONTREAL LOCOMOTIVE WORKS, LIMITED

Atlantic Steam Shovels are different from other steam shovels. They are built along lines established by experience. They have direct wire rope hoist and a locomotive type of boiler. They are designed and constructed along well tried out principles, and do the most work for the least cost.

WIRE ROPE HOIST

exerts a direct pull on the dipper and substitutes friction of a rope with one sheave for that of a chain with from four to six additional sheaves, greatly increasing the efficiency of the shovel and decreasing cost of maintenance.

Wire rope is safer than chain because it does not break without giving warning. It shows signs of wear by breaking strands and can be replaced at a regular shut down. Chain breaks suddenly, causing suspension of work until it can be repaired.

Behind each Atlantic shovel is the knowledge of requirements in the Contracting field, and the application of this knowledge in using the right materials in the right places.

Every part is made in jigs or to gauges, and every repair part is sure to fit. We are prepared to furnish repair parts at short notice from our works at Longue Pointe, Montreal, Canada.

MONTREAL LOCOMOTIVE WORKS, LIMITED

OTTAWA BANK BUILDINGS, MONTREAL, CANADA

KAHN SYSTEM

of reinforced cement includes Rib-Metal for floors, roofs, walls conduits, etc.

Maximum efficiency combined with economy in handling cut to exact length; working drawing furnished.

Kahn Trus-Bars increase the strength of beams 20 to 33 1/3%. Saves labor on the work, eliminating wiring and bending, being **shop prepared** means a great saving of time and labor to the contractor.

Other products, Rib-Bars, Hy-Rib and column hooping United Steel Sash. Trus-Con chemical products for water proofing and finishing cement surfaces. Estimates and catalogues furnished cheerfully.

Trussed Concrete Steel Co.

of Canada, Limited

Head Office: WALKERVILLE - ONTARIO

BRANCHES:

TORONTO—23 Jordan St.
WINNIPEG—Union Bank Bldg.
MONTREAL—128 Coristine Bldg.
VANCOUVER—52 Hutchinson Bldg.
AGENCIES: QUEBEC, HALIFAX

PURE WATER

It is easy to obtain with our plants and apparatus

We design and contract for complete municipal filtration plants of any capacity.

We supply and install apparatus for sterilizing water supplies by the application of calcium hypochlorite.

Literature, Sketches, Estimates and Recommendations Supplied on Request

American Water Softener Co.

1001 Chestnut St., PHILADELPHIA, Pa.

We have no affiliations or working acquirements with any of our competitors.

Doors

Midland Brand

That cannot Warp, Sag, or Crack

Our Doors are made from selected material and by expert workmen. Modern facilities and careful attention to details enable us to satisfy you in price and quality. . . .

Let your next order come to us.

Georgian Bay Shook Mills, Limited

MIDLAND, ONTARIO

London Automatic Batch Mixer No. 1
Capacity 50 yards per 10 hours.

London Concrete Mixers

are made in all sizes, meeting every requirement. CONTRACTOR, WE DO NOT DICTATE TO YOU AS TO WHAT STYLE OF MACHINE YOU SHOULD PURCHASE, we have EVERY STYLE AND SIZE of mixer required.

London Automatic Batch Mixer No. 2. Capacity 25 yards per 10 hour

These machines will be shipped anywhere on approval. WHY PAY A LARGE PRICE FOR CONCRETE MIXER WHEN YOU CAN PURCHASE AN AUTOMATIC MACHINE AT A MODERATE PRICE?

The London Automatic Machines will save you money—
Cost of Producing Concrete.
In the First Cost of Mixer.
Cost of Maintenance.

We also Manufacture—

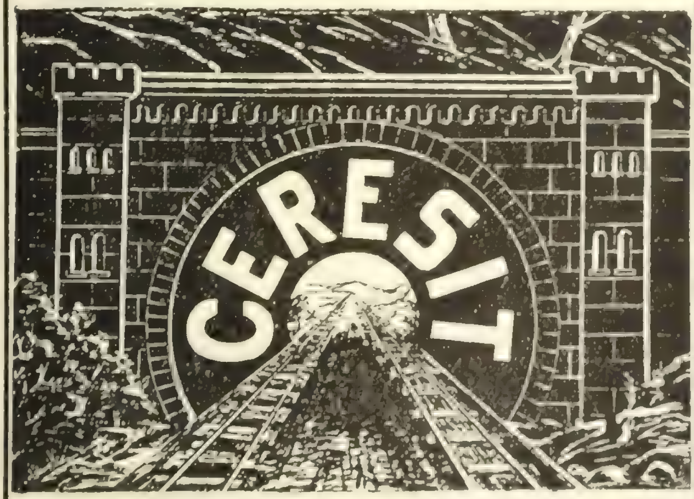
CARTS FOR CONVEYING CONCRETE BLOCKS AND TILE
WHEELBARROWS; CONCRETE CARTS
FACE-DOWN BLOCK MACHINES; FRICTION HOISTS
CEMENT BRICK MACHINES; POWER HOISTS
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES
ADJUSTABLE SILL, STEP AND WINDOW CAP MOULDS;
SEWER PIPE MOULDS; FENCE POST MOULDS;
ORNAMENTAL MOULDS; SILO CURBS
CONCRETE CHIMNEY CURBS;
ROCK CRUSHERS;
And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.

London Concrete Machinery Co., Ltd.

19 Marmora Street, London, Canada

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.



No Wet Cellars No Damp Basements

Ceresit is a cream white paste readily dissolvable in water. This water is used instead of plain water for mixing Cement, Mortar or Concrete.

Ceresit Waterproofing Co.

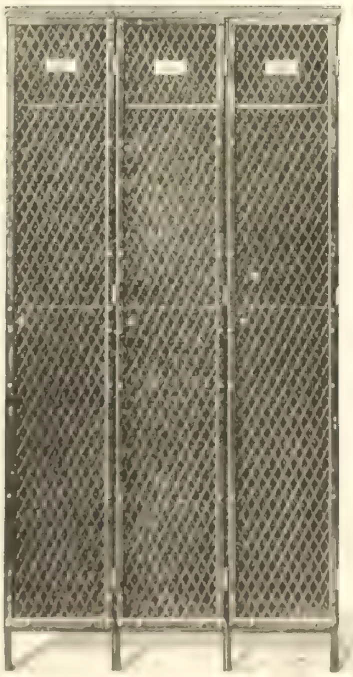
115 Adams Street, Chicago

Canadian Agents

Eadie Douglas, Limited
Montreal, Toronto, Ottawa

Grose & Walker, Limited, Winnipeg
Dean Thompson, Vancouver

GET AWAY



from the old style wooden lockers and use **Meadows' Metal Lockers.** Their construction is rigid and embodies a number of original features not found in other makes worthy of your consideration.

Send for our interesting booklet entitled

"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA

The Ford Iron Co.
485 St. James Street
Montreal

Write us for our Bulletins

GYRATORY BREAKER

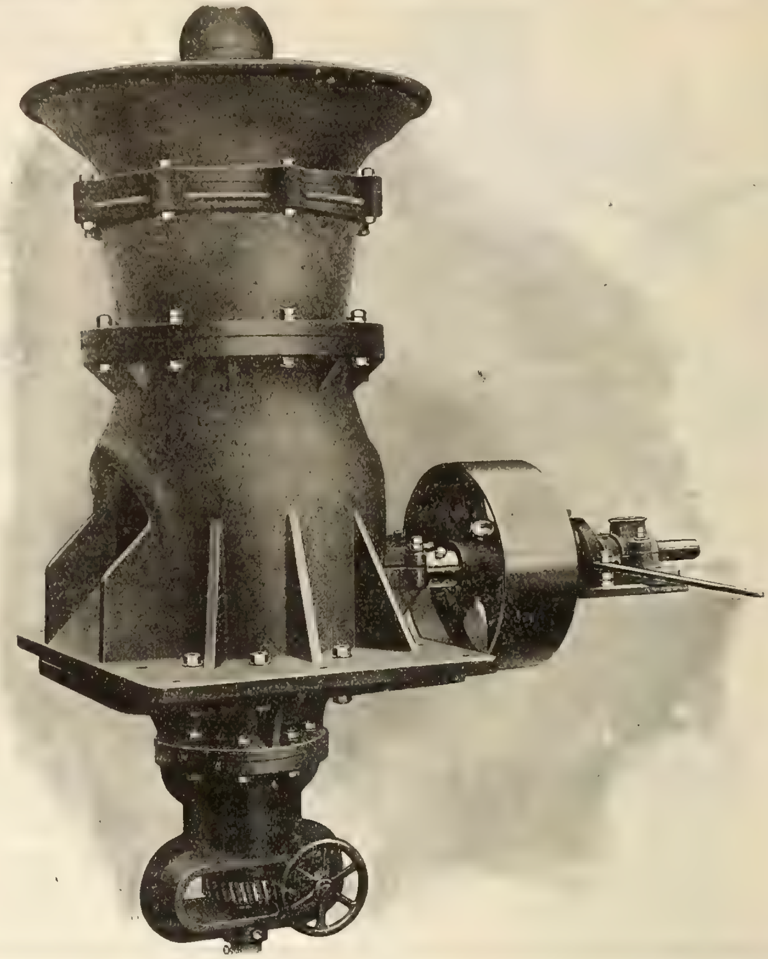
We can also supply our
ACME
Fixed Stone Crusher
Portable Stone Crusher
with or without screens

ACME
Portable Automatic Stone Breaker

RANSOME and M-C Concrete Mixer

HUMBOLDT Machinery

BRUSH Electrical Machinery



THE STANDARD IDEAL COMPANY LIMITED
GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA

The Largest Exclusive Cast Iron Porcelain Enameling Works under the British Flag

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.

HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 June 7, 1911 No. 23

Much Ado About Nothing

Since the city of Victoria awarded a contract for some 600,000 square yards of paving to the Canadian Mineral Rubber Company of Toronto, it has received a number of so-called "protests." Particulars of some of these have duly come to hand. One concern enters into quite a rigmarole concerning the developments which led up to the organization of the company, and the nice things it had hoped to accomplish since that time. Details are even given of the modus operandi of the company's representatives among the ratepayers. The illogical conclusion is made in the protest under discussion that the company, having maintained a representative in Victoria since last July, advertised in the city, etc., should have received at least a fair share of the work. The company is strengthened in this conviction because of the fact that it invited the city council to inspect other work which it is carrying on in Vancouver. Unfairness is charged on account of alleged lack of investigation.

We cannot think that protests of this kind accomplish the desired effect. Such a letter, published in the local papers, has a whining tone about it that would better befit the disgruntled congregation of a country church. There is an atmosphere of futility about it that does not strengthen contracting interests as a whole.

As a matter of fact the Canadian Mineral Rubber Company, the successful tenderers for the contract at Victoria, not only submitted the best possible figures, but they were backed by the strongest recommendations from Winnipeg and other places where their work is considered a standing memorial to their ability.

Where there is close competition and consequently some difficulty in deciding between two contractors it is certainly only fair to have the work of each inspected, but otherwise the city is under no obligation to do so, and in any case it has a free hand to reject the lowest or any other tender, upon the recommendation of its engineer. Had the Canadian Mineral Rubber Company been a United States concern there might have been some reason in the protest, seeing that Canadian contractors are totally excluded from the American field, but this is a Toronto company, doing business on sound principles and strictly Canadian lines.

Competition is essential to trade, and so long as we are beaten in a square deal there is no cause for complaint. It is far better, and more effective, to wait for the odd occasion,—which inevitably comes, when somebody tries to put it over us, and then make a great shout. Besides, it leaves a more abiding impression.

Standard Specifications for Reinforced Concrete

The standard building regulations for reinforced concrete adopted by the Canadian Cement and Concrete Asociation and published in the annual report of that body, fill a long felt want in the Canadian construction field. Their presentation at this time is particularly opportune and doubtless they will receive due recognition at the hands of the civic authorities of Toronto, Montreal, Vancouver and other cities, where defects in the existing codes have done so much to hamper building development. In the proposed revision of the Toronto by-law we would strongly recommend that they be incorporated, with perhaps a few modifications to conform with the organization of the city architect's department. These specifications are based upon those adopted by the National Association of Cement Users, which are regarded as a standard on the other side of the border. The Canadian regulations are designed to serve the best interests of the Canadian field and inasmuch as they are the outcome of exacting investigations extending over more than a year, it may be safely asserted that the best possible practice will be insured by their adoption.

The special committee of the association which brought in the report was composed of Messrs. Peter Gillespie, J. A. Jamieson, Gustave Kahn and C. R. Young.

The Selling End of Contracting

In any mercantile business the most important part is what is generally termed "the selling end," says our Chicago contemporary, The Contractor. Without sales a business cannot live. It is very true that if materials for manufacturing or goods for sale are not purchased properly, the most competent salesman cannot make a business pay. If the manufacturing end of a business is not run properly, even should the selling end be efficient, the business cannot be made profitable, but almost any business man will tell you the hard part of his business is to keep his sales up to a standard and improve on that standard.

A contractor is to some extent a manufacturer and a seller of a certain class of goods. He is the builder or manufacturer of engineering structures, he is a buyer of materials, machinery and supplies, and these, with the labor hired, are made into structures. A contractor does not have these completed structures except in a few cases of some classes of buildings, for sale, but he is always anxious to sell his ability to make them, and the organization that will produce any kind of an engineering structure for which he can contract. Thus there is a selling end to the contracting business, yet few contractors have conducted their business in the past as though this feature merited much consideration.

Very few contractors have ever advertised their business or attempted any systematic methods of obtaining contracts. The practice has been to give close attention to any contracts obtained, so as to do satisfactory work and make money on the job. Then, when new jobs were heard of, every effort is put forth to obtain some of them. These jobs are heard of either by chance or through the technical papers, or possibly through some reporting company. In most cases the contractors are unknown to the owners. On public work this is seldom of importance but for private work it may mean much.

Most public work is advertised. Most of this advertising is through the local newspapers and the technical journals. The law governing public lettings generally provides that the contract must go to the lowest possible bidder, or all bids must be rejected.

Many private corporations keep lists of contractors, from whom they ask bids. Others, who may not do much construction, make up special lists from whom bids are asked, or they allow any contractor asking permission to estimate, to submit a proposal. Some few corporations call upon a contractor and by a simple agreement as to general terms and prices, allow the contractor to do their work. Some contractors seem to secure a large number of contracts by these haphazard methods, but many contractors are frequently out of work or seldom have more than one job on hand.

There should be few contractors who cannot run more than one job. Even if their capital is limited, it is possible to do several jobs at one time, as every contract obtained is an additional asset. Thus it is seen that most contractors pay but little attention to the selling end of contracting. Yet there is no reason why it should not be considered as much as the operating part of contracting.

There are several ways that a department organized for this purpose could obtain results. First, all information gathered from the various technical and contractors' papers could be indexed and followed up by letters and personal calls. Then a judicious campaign of advertising could be carried on. Advertisements could be placed in the engineering and contractors' papers and also in the daily papers when work is to be confined to given localities. In such advertisements, just to publish the company's name and address with a photograph of some work done will hardly do much good. Tell something of the contracting company, the class of work they do, the fact that contracts are finished without disputes, and that they are completed on time. Show how money has been saved to clients. If certain classes of work are made a specialty, enlarge on the ability to do this work better than other contractors. If a certain form of contract is used, explain it and its merits. From time to time give lists of various contracts satisfactorily completed. In other words, say something in the "ads" that will attract special attention to the company. It may not be possible to trace direct results to all such "ads" but the publicity will make the company well known and materially assist in landing contracts.

Another method of advertising is to issue attractively gotten up books or pamphlets well illustrated, descriptive of work done in the past. These can be distributed among engineers and owners, who may have construction work to do.

A third method of advertising is to send circulars through the mail to those who may have jobs to let. This, if consistently followed up, brings returns.

Another method, used by an eastern contractor, is to employ a man who is really his solicitor. This man keeps posted on work to be let and keeps in touch by correspondence and personal calls on all officials and owners who have to do with the letting of work. He need not be an engineer or have had experience as a contractor, although both of these are to be preferred, but he should be a man of attractive appearance, able to put up a good sensible talk on construction work, and he should have the ability to impress those to whom he is talking.

This solicitor has nothing to do except to obtain work, and he is paid a drawing account and a commission, on the profit made on all jobs he obtains. This method is proving a success and jobs have been obtained that would not otherwise have been heard of by the contractor.

Thus, this contractor has his construction department, his engineering department (which has charge of all estimating and engineering work), his financial department and his selling department. With a well balanced organization of this kind he is becoming one of the best known contractors in his locality.

An Attractive Publication

Portland Cement on the Farm is the title of an attractive book just issued by Alfred Rogers, Limited, 28 King street west, Toronto, agents for the independent cement companies. This book is most artistically bound, is printed on heavy India tint paper and contains 128 pages replete with excellent illustrations. It contains practical directions which may be used by the farmer at little expense in permanent fireproof concrete. It tells the farmer of the many forms of construction to which cement is particularly adapted in his work, at the same time giving him details of the most satisfactory methods of construction from the ground up. There are illustrations of farm houses, barns, outbuildings and all kinds of improvements in concrete. Ample justice is done to the possibilities of the material in every department and the book is one which should be of interest not only to every farmer but to every cement worker in the country. The cost quotations given in this book are an interesting feature. The estimates have been made at approximately one-third over market prices for the various independent brands of cement. This leaves a cost margin for transportation and makes the estimates applicable to any locality in Canada. The Rogers brands of cement are the Crown, Hercules, Imperial, Maple Leaf, National, Saugeen, Sterling, Sun and Superior.

One million one hundred thousand dollars a month is the record of new buildings so far this year at Winnipeg, the total to date exceeding five and half millions. These figures do not take into account any buildings in the immediate surburban districts, of which there is an unusual development this year. An authoritative statement of the activities in new buildings in the principal cities of the three western provinces has given $50,000,000 expenditure as the minimum.

Progress of Quebec Bridge Construction

The Practical Problems of the Work and How they have been Solved to Date—Criticism of the Accepted Design

Special to the Contract Record

The work on the foundations for the new Quebec bridge is in full swing and is being pushed energetically by the contractors, Messrs. M. P. & J. T. Davis. As stated in the Contract Record of May 3, 1911, the new span is to be 1,800 feet in length. The axis of the bridge remains as in the original structure. The new north main pier will be 65 feet farther out into the river than the old pier, while the new south main pier will be correspondingly 65 feet nearer the south shore. Owing to the change in length of the anchor arms, the location of the north anchor pier will be 50 feet south of the existing pier and an intermediate pier will be built between it and the abutment, which remains in the same position as originally. The new south anchor pier will be 80 feet south of the original one.

Owing to the severe climate of Quebec the work for 1910 was stopped in November and the only work done during the winter was the widening of the rock cut on the north side which necessitated a removal of 20,000 cubic yards of solid rock. About the middle of March work was begun at Sillery on the two new caissons for the north main pier, and as soon as the river was free from ice, in April, work was commenced at the bridge site on both the north and south sides.

View from south side showing old south main pier: in the background the plant on north shore.

Plant at north shore. Anchor pier in background.

On account of the difficulties encountered in the sinking of the north caisson in 1910, the masonry plans have been changed by the board of engineers. A huge caisson, 180 ft. 6 ins. x 55 ft. 6 ins, was built early in 1910, as described in the Contract Record of Sept. 7, 1910. This caisson was put in place and about 8 feet of concrete deposited on the deck where the caisson became strained and developed leaks which caused the work to be stopped. The concrete was blasted out and the caisson towed to the dry dock at Levis and repaired. This caisson remained in the dry dock all the winter. After the additional repairs now being made are completed, the caisson will be sunk for the south main pier. It will be towed to the bridge site and put in place, and will remain there all summer, while two new caissons building at present will be sunk this season for the foundation of the north main pier.

These caissons are identical, each 85 feet x 60 feet in dimensions, and will be placed end to end, 10 feet apart, one each side of the bridge centre line. They are built of 12 in. x 12 in. Georgia pine and are up to the standard of modern practice in caisson foundations. The cutting edge is British Columbia fir, 30 x 30 ins., and instead of a steel shoe it will rest on an oak wearing timber 12 in. x 6 in. This wearing timber can be replaced when injured much more readily than a steel shoe which becomes badly twisted by blasting. The corners of the caisson are protected by steel shoes.

The working chamber of the caisson is 8 feet in height and is divided into four large compartments by solid bulkheads with doors for intercommunication. Each compartment is subdivided again by a truss or skeleton bulkhead of timber with diagonal truss rods. The roof of the air chamber is 3 feet thick, well caulked and braced to the walls by 12 in. x 12. in knee braces.

Above the deck is the crib, consisting of three longitudinal rows of timber and seven rows of transverse timbers, all 12 in. x 12 in. The caisson is stresgthened by six truss rods of 2½" of steel running diagonally from the wall under the longitudinal bulkhead and up to the other wall. The walls of the caisson are caulked and then sheathed with 6 ins. of spruce to protect the caulking. These caissons are being built at Sillery and will be launched on the high tides about this date.

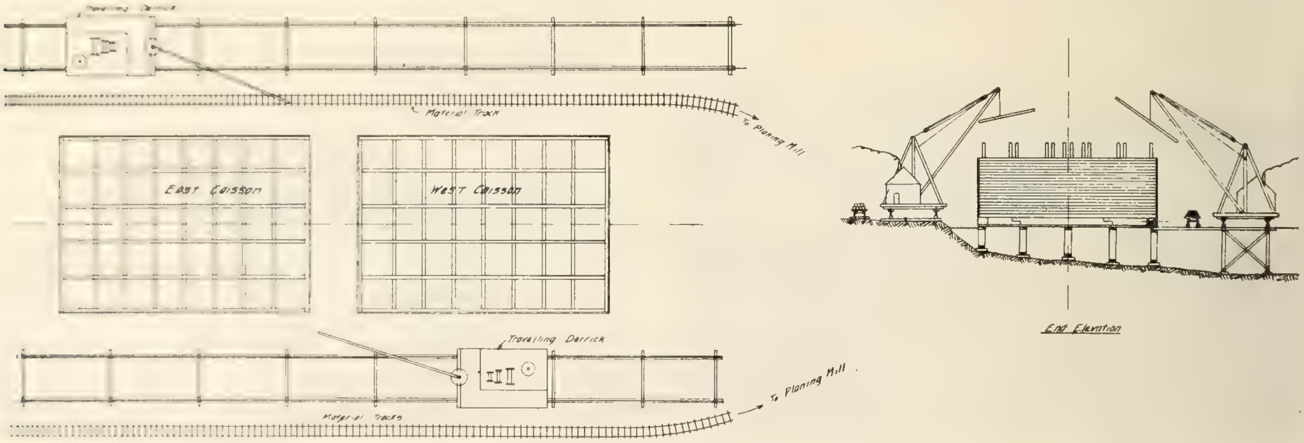
Bridge Site

At the bridge site, on the north side, preparations are being made for the caissons. The air compressor plant has been overhauled and put in shape for the sinking of the caissons. A great part of the pile platforms was removed in the autumn to prevent damage by the ice. This is now being replaced. The work on these platforms is being pushed at top speed. Two pile drivers are being worked day and night. The

Pointe a Pizeau. Two caissons for north main pier.

South main pier.—Note coping broken by falling steel.

contractor has installed an electric plant to light the work at night. The platforms will completely surround both caissons and will carry the material tracks and derricks for handling the concrete. Six stiff leg derricks are being erected, three on the south and three on the north side of the caisson.



Sketch showing method of handling material in construction of north caissons.

The swift current and great rise of the tide necessitate great precautions and the caisson will be anchored by steel cables to "dead men" placed about 900 feet up and down stream respectively.

The concrete plant is at the foot of the cliff and consists of two Gates stone crushers and three concrete mixers—two Ransomes and one Smith mixer.

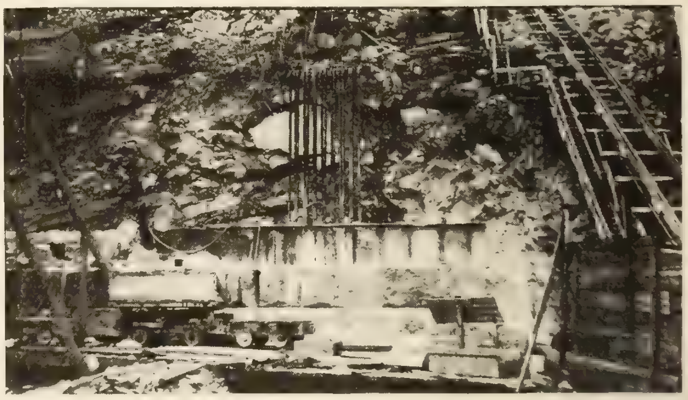
The stone and sand are brought by cars to the top of the cliff and shot down to the concrete plant by chutes. The cement will be lowered by a gravity elevator, the full car hauling up the empty one. The contractor has also installed an elevator for other material, this being operated by a 3-drum hoist.

The old anchor pier, which is to be replaced by a larger structure has been taken down and the stone is being re-cut for the new pier.

South Side

The south side of the river is also the scene of activity, the work here being carried on by night, as well as day, to take advantage of every low tide. The resting place of the huge caisson is being levelled and large rock filled cuts are being erected to form a protection from the swift current. The south main pier has not yet been removed and it will give additional protection to the caisson. It is expected that the sinking of this caisson will be started this sum-

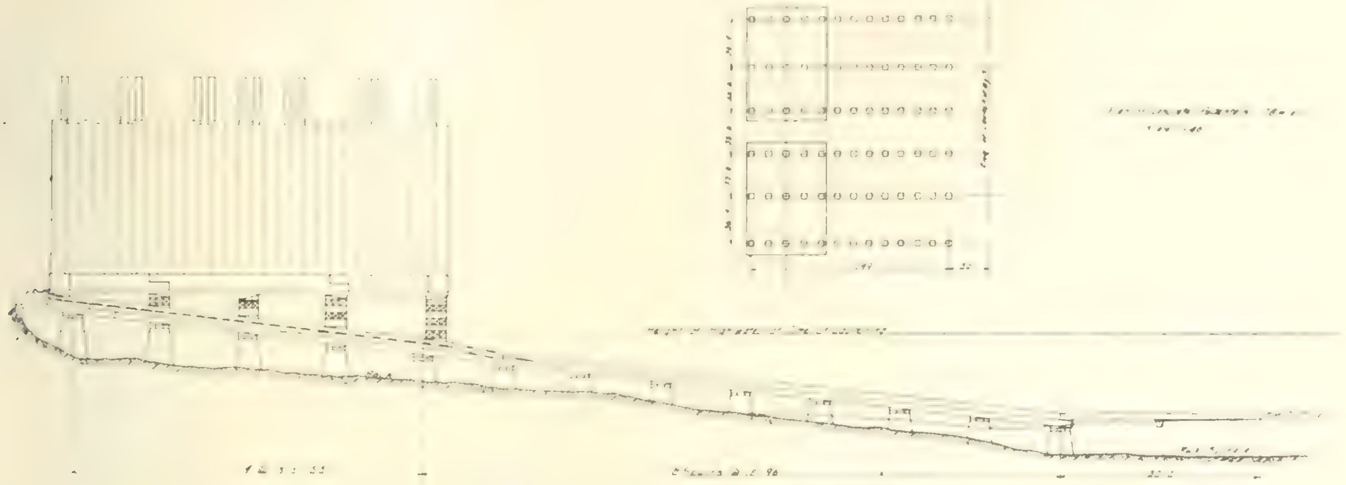
Driving piles at north main pier to make platform for new caisson.—Remains of old main pier to right.



Removing north anchor pier, showing anchor girders and eye bars.

mer. It will be carried deep enough to be proof against any movement from the ice.

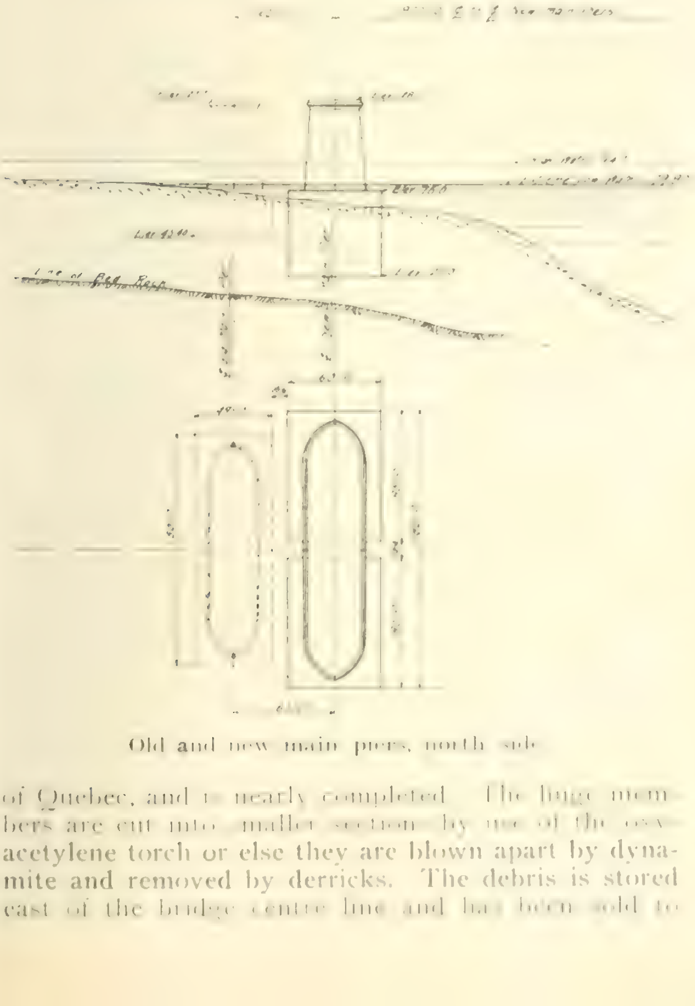
Phoenix Bridge Company



Sketch showing two north caissons on launchways.

When the ill-fated bridge fell in 1907, the two approach spans remained standing. The contract for removing them was let to their builder, the Phoenix Bridge Company, of Phoenixville, Pa. The north approach span was removed in 1910 and the plant removed to the south side when work was stopped for the winter. At present the Phoenix Bridge Company are removing the south approach span.

Koenig & Co.



Old and new main piers, north side

The contract for the removal of the debris of the old bridge is being handled by Koenig & Company, of Quebec, and is nearly completed. The large members are cut into smaller sections by use of the oxyacetylene torch or else they are blown apart by dynamite and removed by derricks. The debris is stored east of the bridge centre line and has been sold to the Dominion Steel Company of Sydney, N. S., who will shortly begin to remove it.

The contractors for the new masonry are the same as for the old, viz: Messrs. M. P. & J. T. Davis, whose chief engineer is Mr. Walter Retner, of New York. Mr. Retner has had wide experience in caisson work. Among other work he handled the caissons for the Manhattan bridge. Mr. M. P. Davis is also very active in his direction of the work.

At present Messrs. Davis have about 600 men employed on the work. They have an extensive plant of boilers, enginer, air compressors, hoists, scows, etc.

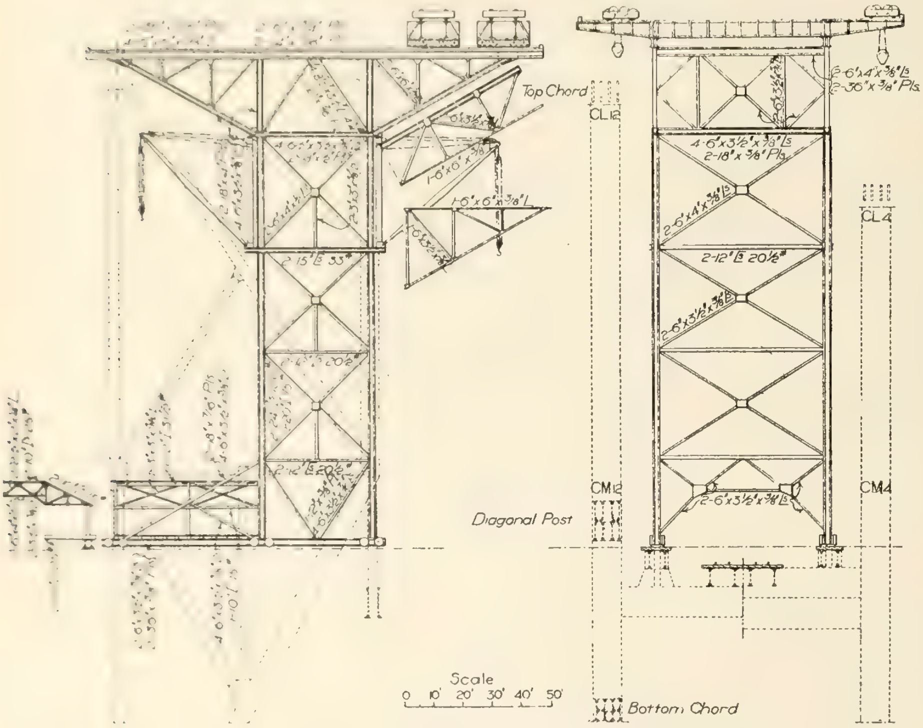
The supervision of the entire bridge is in the hands of the board of engineers for the Quebec bridge, of which Mr. C. N. Monsarrat is chief engineer and chairman, with Ralph Modjeski, of Chicago, and C. C. Schneider, of New York, consulting engineers.

Mr. J. D. Wilkens is resident engineer in charge of the work. The engineering staff occupy offices on the north shore, overlooking the river, and only a few hundred feet from the bridge.

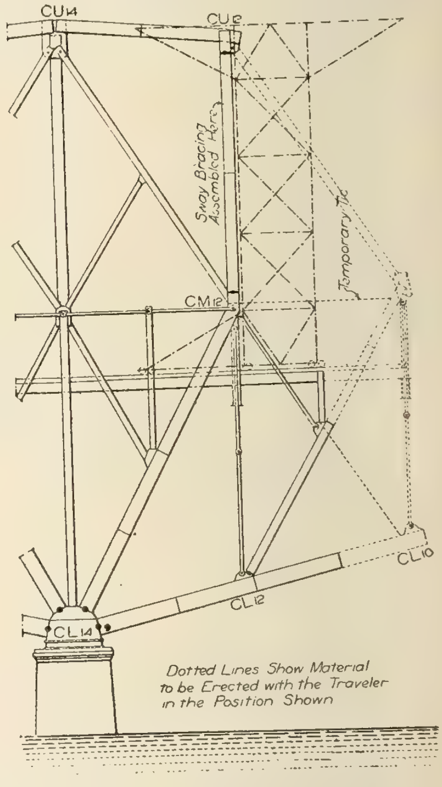
The Accepted Design for the Quebec Bridge

The design on which the $8,650,000 contract has recently been awarded to the St. Lawrence Bridge Company, of Montreal, for the fabrication and erection of the superstructure of the Quebec Bridge is for a very much heavier, stronger and more costly structure than the original bridge design of the Board of Engineers, and from the designs submitted by other bidders, says the Engineering Record. It restores the length of the main span to 1,800 feet, increases the length of the suspended centre span to 640 feet, involves the construction of an entirely new substructure, and the dead weight is considerably reduced by the use of nickel steel for all principal members between the main piers, while greater mass and counterweight in the anchor arm has been secured by the use of carbon steel there. Eyebars have been eliminated in favor of rivetted tension members in the cantilever arm, but some of these have been provided with pin connections to facilitate erection. Many details of connections that were carefully developed in the official design have been retained or modified in the contract design, but the arrangement of the web members in the cantilever and anchor trusses is entirely different from that design or from that in any American bridge, and is considered statically determinate with a minimum of secondary stresses and with no redundant members in the cantilever arms. The conspicuous omission of the members usually provided to connect the top chords of the centre spans and cantilever arms emphasizes the structural independence of the stresses. Modifications have been made in the original specifications and the present design has been carefully revised by the commission. The consulting engineers and the contractors have had the advantage of a careful study in connection with the original bridge, the great spans recently erected in the United States and the variety of designs submitted in competition with it.

The top chords and the main tension diagonals are all made of four heavy plate webs connected by very light bracing. They have a maximum depth of 78 in. for pieces 86 ft. long, thus developing great stiffness to resist flexure from their dead weight. The bottom chords have four webs 78 to 48 in. deep, with full length longitudinal plate diaphragms. Both top and bottom chords are made in full panel sections of a maximum length of 86 ft. and will be fully spliced with joints made and completely riveted as the erection progresses. The web members are pin-connected to gusset plates projecting beyond the top and bottom chords so that neither of the latter have pin holes through them. The bottom chords have half-hole pin bearings on the main pedestals at the river piers, and the principal compression members in the truss webs have similar bearings at both ends. None of the compression members have forked ends, the maximum members will have a shop length of about 43 feet and a weight of about 300,000 lb., but it is believed that they can be fabricated without special difficulty.



Elevation of the Inside Traveller.



Dotted Lines Show Material to be Erected with the Traveler in the Position Shown

Members erected in One Position of Traveller.

In each panel the shear, being divided between two principal web members, is reduced to a moderate amount except in the main diagonals meeting on the river piers, and the chord connections providing for a moderate increment of stress at each panel point do not present special difficulties.

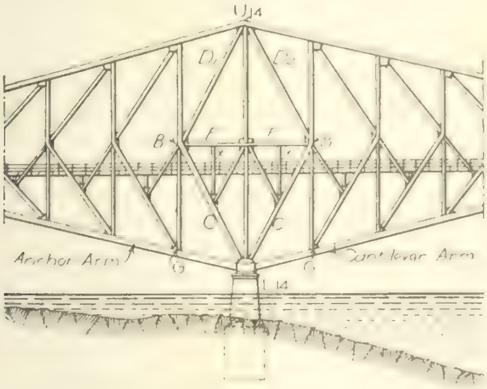
In the cantilever and anchor arm trusses all members carry both dead and live loads excepting the four secondary ones marked X in the pier panels. All shear transmitted to points BB is taken directly down the inclined posts CC to the pier bearings, and the horizontal thrust at the points BB is taken by the tension subcord EE. Because of the shorter length of the anchor arm, the shear there will always be greater than on the cantilever arm, and the function of the diagonals D D is that of compensating braces carrying part of the shear from the anchor arm to the cantilever arm side, D1 being always in tension and D2 always in compression. The useful result of this construction is that the local distortion immediately at the pier is only that due to the compression of the comparatively short members c c, added to the depression, due to other sources of the panel point g g.

Comparison of the displacement diagram for this design, for the official design and for the designs previously used in cantilever bridges shows far less secondary stresses in the members connected to the main shoe in this design than in any other design examined, all of the secondary stresses in it being so small as to be considered practically negligible.

The contractors consider the greatest advantage in their design to be the ease and safety with which it is believed that the structure can be erected. Most of the members can be independently erected in due sequence. An overhang of only 42 ft., or one subpanel, is required for the traveler instead of two or three times as much which would be necessary for the erection of most of the other designs. This enables the length of the traveler to be sufficiently reduced to enable it to clear the sway-bracing at the first panel point from the end, thus permitting that bracing to be always connected up close to the traveler and maintaining the stability of the trusses as fast as they are extended. It is intended to complete the erection of the anchor arms before commencing that of the cantilevers.

The most difficult and critical part of the work will be the placing of the 5,000-ton, 640-ft. suspended canter span which it is proposed to erect by ordinary methods at the proper height on shore falsework, which will be floated with it to position between the finished cantilever arms and connected to them. As there is here an average tide of 16 to 17 ft. and a corresponding current of six or seven miles per hour, the difficulties are great, and the feat will be one demanding the utmost skill and ability. No precedent of equal magnitude exists, but the contractors have for many years successfully employed this method of erection for numerous smaller spans, such as the Miramichi, the Fraser River, the Coteau and other important bridges.

It is proposed to erect the cantilever and anchor arms by a 600-ton steel traveler running on a special track carried on the regular floor-beams. The traveler will have a clearance of about 10 feet on each side with the trusses, and will run on two standard-gauge tracks about 54 ft. apart on centers, each carried by two lines of stringers 6½ ft. deep, borrowed from the permanent structure. The traveler will have a 36 x 54-ft. tower 160 ft. high, with a base extended in the rear to a total length of about 85 ft. It will be of riveted construction, with four vertical main columns. There will be a clearance 20 ft. high through the bottom extension for the delivery of materials to the overhang on a center service track, each side of which there will be cantilever platforms for the hoisting engine. The top chords of the overhang, about 150 ft. long over all and 54 ft. apart on centers, will form runway girders for two double cantilever traveling cranes, each of them having overhangs of 25 ft. which command both trusses with two trolley hoists of 60 tons capacity. This will enable all principal truss members to be erected simultaneously in pairs.



Panels at Main Pier.

The facility with which the most difficult portion of the erection can be handled by this traveler is indicated by the diagram of the first two panels, C10-14, of the cantilever arm, where the traveler, supported on the semi-panel C12-13 clears all of the C12 connection and commands semi-panels C13-14. In this position it assembles all of the members indicated by dotted lines and thus completes the erection sufficiently to enable it to advance to C14 and erect the next sub panel and so on.

Discoloration of retaining walls built in trench and temporarily backfilled along the face was avoided by using cinders, in the Bloomfield, N. J., improvements of the Delaware, Lackawanna & Western Railroad. The walls were built in advance of the general excavation for depressed tracks, and on account of their great extent and height, it was necessary to pull the trench sheeting for re-use, the trench being filled front and back. If the original material, a reddish, sandy clay, were used or were permitted to run in against the wall face, there was danger of serious discoloration of the surface. In addition, this material was of a character such that it would stick to the wall, necessitating close approach of the steam shovel dipper in loosening it. This presented the danger of marring the wall with the dipper teeth. It was found that the cinder fill preserved a dry, clean surface, and that it flowed away from the wall toward the shovel in excavating so that it was not necessary for the teeth to approach the face closer than about 2 ft.

Cost Keeping for Contractors

A recent issue of the Journal of the American Society of Engineering Contractors contains an article entitled "Cost Keeping and Its Value in Relation to Estimating on New Work," which is significant in its substance as well as its title in that it indicates that the contractor of to-day is looking upon his business as not merely that of a good "boss," getting a maximum amount of work out of each laborer at the minimum wage, but that he is advancing it to be a profession, the laws of which should be studied and mastered if success is to be attained.

Even more significant of this than the paper itself was the discussion, in which several contractors stated their belief in this idea of contracting. One contractor whose work is largely reinforced concrete stated: "I keep a clerk on all of my work, and he has nothing to do but one thing, keep the time and keep track of the materials and their disposition. He check up materials, and that relieves the foreman of that duty. . . . It is a small job that does not pay for the clerk to keep time and check materials. I think that is as necessary as any other part of the work. If there is a bag of cement that goes over to a certain footing it is charged to that footing, and so on for other sections of the work. And all it costs to know that is the salary of the man who is taking notes of them."

Another speaker summed up the advantages to contractors of cost keeping as follows: "The old-fashioned contractor who did not keep cost records never knew whether he had made or lost money on his job until it was completed; and if he had made money he did not know on what items he had made it. He had made money on the whole job, and that is all he knew. And he used those same figures on the next job, if it was similar to the previous one; whereas, if he had kept a cost system he would have been able to bid more intelligently on work by reducing the price on some of the items where he had made more money than was necessary, and increasing the price for those items on which he had figured too low before."

The author of the article, Berton M. Laughead, described in brief what is included in such cost keeping as follows: "In order to successfully make estimates that will enable a contractor to make safe bids, it is absolutely necessary that he keep daily records, in detail, of every branch of his work, so that on completion, he will be able from such records to compile a final cost sheet that will show him the total cost and the cost per yard of his work."

The Practical Phases of City Planning

The Experience of Well Known Experts, as given at the Recent Conference in Philadelphia Abstracts of Principal Addresses

An excellent programme of papers and discussions was given at the third national conference on City Planning, at Philadelphia, May 15-17. A feature of the meeting was an exhibition of drawings and photographs conducted by the city of Philadelphia. The pictures illustrated the achievements of upwards of 100 cities in the United States, Canada, England, Germany and other countries.

Among those who attended the convention were Mr. Raymond Unwin, of London, Eng.; Mr. Thos. Mawson, of Liverpool University, Eng.; Mr. Thos. Adams, of London, Eng.; and City Engineer Rust, of Toronto. The attendance included, of course, the leading American experts.

Synopses of the principal papers are given below. It will be seen that these papers were confined almost exclusively to the practical phases of city planning and not to the aesthetics of the subject. The idea of the new city planning movement is not so much the "city beautiful" as the **basic plans** of the city, including streets and parks, and the relation of public and private buildings to each. It is the practical side of the work which demands the more serious consideration at this stage.

The main topics chosen for each of the seven sessions were as follows: (1) Municipal Real Estate Policies; (2) Public Buildings in General and Their Location in Reference to Parks and Open Spaces; (3) Buildings in Relation to Street and Sites; (4) Taxes, Assessments and Condemnation; (5) Dock and Harbor Improvements; (6) Street Widths and Their Subdivisions, and (7) A Uniform City Planning Code.

German Municipal Real Estate Policies

Some of the work done by German cities in city planning was outlined by Mr. Frederick C. Howe, of Washington, D.C. A German city enjoys almost supreme home rule. The American city is subject to legislative control. Every German city now has a plan formulated by landscape architects and by engineers and other specialists working together. Many German cities are large owners of land from which heavy revenues are derived. The cities have adopted the policy of "excess condemnation," or taking more land than is required for city improvements, selling the surplus at sufficient profit to pay for all or a part of the cost of improvement. The taxation of the unearned increment is also common. In some cases this tax amounts to from 33 to 40 per cent of the increase in its value. Mr. Thomas Adams, city planning expert of the local government board of England, opened the discussion on Mr. Howe's paper.

Public Buildings, and Their Location in Parks and Other Public Open Spaces

A paper on "Public Buildings" was presented by Mr. Ernest Flagg, of New York city. After showing how the advent of steel skeleton buildings in America had been really the introduction of a new type of construction rather than a new type of architecture, and remarking that the recent introduction of steel construction in France bids fair to be accompanied by complementary architectural development, Mr. Flagg made some remarks on the height and location of public buildings.

He asked whether we are likely in this country to use low structures for public buildings or out-Herod Herod by making our public buildings even taller than our business structures. He thought the latter was likely, and predicted that within 25 years American cities would be running up public buildings 2,000 ft. in height. He brought in here his suggestions, previously made public, looking to a limitation on the height of that portion of buildings occupying a space equal to the whole ground area, but with no limit to the height of the tower portion of the buildings.

As regards sites for public buildings, he suggested that we might in this country well follow the example of European cities in clearing slum areas for city replanning purposes and in utilizing a portion of them as sites of public buildings. When public buildings are located in an old business center, they add but little to the taxable value of the district and destroy old landmarks. By going a little to one side of business centers, land could be secured at low cost and the value of the whole district be materially increased by the erection of public buildings.

Mr. Frank Miles Day, of Philadelphia, read a paper on "The Location of Public Buildings in Parks and Other Open Spaces." He called attention to the large sums of money often expended in the acquisition of lands for public parks and squares and the continental pressure which is being brought upon public authorities to place public and semi-public buildings within these areas.

In essentially park areas, whose original justification was their sylvan landscape effect, buildings are generally an intrusion. There may be cases, however, where a portion of park land is naturally separated from the remainder or perhaps surrounded by buildings in such a way as to make it advisable to use these special areas as sites for public buildings.

Mr. Thomas Mawson, of the University of Liverpool, England, took exception to a statement by Mr. Day that architectural objects are out of harmony with rural landscapes. Mr. Mawson thought that instead architectural objects give a poetic and romantic touch to parks.

Mr. F. L. Olmsted remarked that a park now without a public building, which would be better if it had one, was faulty in its original design. Where architectural features mar parks and open spaces, this is usually due to haphazard location of the buildings or a vacillating policy. Sometimes to re-design a park is necessary on account of an original mistake in laying it out or because of changed conditions. The Museum of Natural History did not invade Central Park, New York, but instead a piece of land not suited to the general purposes of Central Park and partly separated from it was completely cut off and dedicated to a new purpose.

In planning new tracts or additions to cities, it is advisable to make reservations for future public use, final use to depend upon circumstances. Some of these areas may finally be occupied by public buildings.

A member from Baltimore remarked that boulevards in open spaces in that city would have saved a large part of the fire loss which took place at the time of the great conflagration there. He also said that using small open spaces for buildings was generally an example of trying to get something for nothing.

Buildings in Relation to Street and Site

This subject was introduced by Mr. Lawrence Vellier, of the National Housing Association, New York city. As an illustration of the fact that city planning is not a full solution to the housing problem. he said that Washington is one of the best planned cities in the world and has some of the worst slums. City planning has three important relations to housing: (1) regulations of heights of buildings; (2) depths of lots, and (3) width of alleys.

Mr. Veiller presented his subject largely from the viewpoint of the housing of the so-called working classes, with particular relation to populations of foreign origin and but small earning capacity. All sentimentalities aside, and viewing only the known habits and financial limitations of these classes, the best means of housing them is to limit lot depths to 25 ft. and build rows of houses occupying the full depth of the lots. Such houses would be only two rooms deep, and thus every room would have light and air. Where great masses of people must be housed, back yards and play places have generally been a failure. Where land is reserved for front or rear yards it soon becomes bare ground and littered with rubbish. It is, therefore, useless to provide more space than what is required for light and air. Even in relatively small towns there is a remarkably strong opposition to any limitations put upon the utilization of land for building purposes.

It should be clearly understood that the 25-ft. solidly-built-up lot is designed only for unskilled laborers with limited means and desires. The author suggested more liberal provision for other classes of laborers, such as lots of 50 ft. and 125 ft. in depth. He remarked that to get away from the uniform street and block plans would be a revolutionary step in city planning in America, but submitted the proposition as an eminently practical one worthy of consideration.

The alley was characterized by Mr. Veiller as both a blessing and a curse. It has value for light and air purposes, but is generally an evil through becoming a dumping ground for all sorts of cast-off material, besides harboring serious nuisances. In a number of cities alleys are not a distinct evil. Where they exist they should be paved, lighted and cleaned by the city, receiving the same treatment and care as streets.

As to the regulation of heights of buildings, the author remarked that hotels and some office buildings must be high in practically all cities of any size, but, that outside of New York city there is sufficient room to render tall buildings for general use unnecessary. The first thing to be done is to get streets right as to widths, and then to make the buildings conform to the widths of the streets. Outside of New York and Boston there is no reason why building heights should not be limited to the widths of the streets. As a rule, a height of six stories should not be exceeded except in selected areas.

English Experts' Views

Mr. Raymond Unwin, of London, England, author of "Town Planning in Practice," said that he believed that city planning could be made to do more for housing than Mr. Veiller thinks. In densely populated England a space of 15 ft. is required at the rear of each house line, or 30 ft. in all between rear house lines, and the height of the house is limited to three storeys. Mr. Unwin also took issue with Mr. Veiller's ideas as to the advisability of providing garden spaces for laborers. He urged that sanitary abuses in alleys should be prevented instead of permitted. He thought tnat the block dwelling so common in the United States, and which is sometimes displacing the single dwelling in England, is very harmful. Some of the population should be carried into the suburbs, as in the garden cities and garden suburbs. The British Town Planning Act, he remarked, provides for controlling all these matters.

Mr. Unwin stated that streets are the most expensive and disagreeable form of open spaces that can be provided for the people. Building fewer houses to the acre but slightly increases the rental value of the house and grounds combined. Estimates show that three times the lot area can be provided for only 25 per cent. additional rental charge.

Mr. Thomas Adams, of London, said that the people of England are not docile, but that those of this country are. The English people refuse to be shut off from nature. He suggested that Mr. Veiller read the British Town Planning Act and learn that planning and housing are intimately related. The growth of cities must be directed into the suburbs. The alternative is not between ownership and tenantry.

In closing the discussion, Mr. Veiller mentioned some of the obstacles he had encountered during his fifteen years' work in attempting to bring about housing reform in American cities and to secure needed housing legislation in American states. So far as the population to be housed is concerned, we have to deal here with people from every country on the globe, which is very different from dealing with the homogeneous population of English cities. As an illustration of the difficulties encountered in securing legislation which will interfere with the personal liberties of the American citizen, Mr. Veiller said that for some weeks an attempt, thus far unsuccessful, has been under way to get an act through the Pennsylvania Legislature requiring that there should be one water faucet in every Philadelphia tenement; also, that while the health department of Philadelphia has the right to enter tenements for sanitary inspection it has a right to enter private houses for that purpose.

Street Widths and Their Subdivision

Mr. Nelson P. Lewis, M. Am. Soc. C. E., chief engineer of the board of estimate and apportionment, New York city, and chairman of the conference committee on Street Planning, introduced the above-named topic by remarking that readjustments of widths of old streets is sometimes possible and necessary, and may be effected by narrowing sidewalks and removing sidewalk obstructions, as has already been done on 5th avenue, New York City, and as is now under way or proposed for several other overcrowded thoroughfares.

The first paper presented at this session was by Mr. Charles Mulford Robinson, civic adviser, Rochester, N. Y. The paper was entitled "Narrowing of Minor Residence Streets as Affecting Tenant and Owners," and was summarized from the chapters of a forthcoming book on "The Width and Arrangement of Streets," by M. Robinson.

Minor residence streets, Mr. Robinson remarked, are more numerous than those of any other class. A rigid adherence to standard street widths, regardless of the character of the streets and their occupants, places unnecessary burdens on abutting property, on account of the heavy cost of improving the street surfaces—and the speaker might have added because of the unnecessary cost of the land itself. This discourages development. Narrower streets would divert traffic to streets better designed to carry it, and would thus diminish the up-keep and lengthen the life of the pavements of the minor streets. Where wide streets are needed for through traffic in residence districes, the cost and excessive needs of local traffic might be placed upon the town as a whole. Considerations of this character are particularly important where the number of houses to the acre is limited, as is now being done in England.

Mr. John Nolen, landscape architect, Cambridge, Mass., submitted a paper on "Standardized Street Widths." His basis for standardization is the required unit width for a line of vehicles in the roadway and a line of pedestrians on the sidewalk. He gave standard street widths adopted in Washington, D. C., and a number of German cities, and suggested a tentative standard for American cities in general to be adapted according to local circumstances.

In discussing the paper just outlined, Mr. B. A. Haldeman, engineer in charge of city planning, Bureau of Surveys, Philadelphia, said that scientific study of each street problem is more important than any rules. It is always necessary to do more or less replanning. The most essential consideration is a wiser regard for the needs of the city, which should dominate private interests. The control of street planning should be vested in a strong administrative body.

Two important considerations are standard unit widths and the provision of an elastic street. Since there is no likelihood of legislation fixing the width of vehicles, the assumption of a unit vehicle width of 9 ft. would perhaps be wiser than 8 ft. An allowance of 2 ft. as a pedestrian unit might be assumed. A planting space of 4 ft. for narrow and 8 ft. for wide streets might also be assumed.

The elastic street would combine present economy with the possibility of a future increase in capacity. It might begin with a width of two vehicle units for a roadway, or 18 feet, with 6 feet for each sidewalk, or a total width of 30 feet. The understanding, of course, is that streets under the elastic plan would be widened as traffic increased, but that meanwhile abutting property owners would have the reserve space virtually added to their front lawns. In conclusion, Mr. Haldeman said that skill, courage and power are more important than rules when dealing with street problems.

A paper on "The Street Surface" was next presented by Mr. Geo. W. Tillson, M. Am. Soc. C. E., now Consulting Engineer of the Borough of Brooklyn, New York City, but until recently Chief Engineer of the Bureau of Highways, Borough of Manhattan. The greater part of Mr. Tillson's paper consisted of a discussion of the various classes of city pavements. In his prefatory remarks, Mr. Tillson suggested a classification of streets into wholesale, retail and residential, with the idea of apportioning relative widths of roadway and sidewalk and choosing the pavement to suit various classes. Obviously, sidewalks for wholesale streets could be narrower and the roadways wider, relatively speaking, than those of retail streets. A roadway 42 feet wide might be allowed with two 9-foot sidewalks. The roadway width is based on an allowance of 13½ feet on either side of the street for trucks being loaded, and 15 feet for clear roadway for traffic, it being assumed that there would not be a continuous line of trucks under processes of loading on each side of the street.

"The Sub-Surface" of streets was considered in a paper by Mr. Geo. S. Webster, M. Am. Soc. C. E., Chief Engineer, Bureau of Surveys, Philadelphia. Since 1902, no vaults have been allowed beneath the Philadelphia streets nearer than four feet to the surface, the prohibition being designed to give space for pipes and wires. No underground structures are allowed in Philadelphia for which a permit has not been secured from a board of city officials created for that purpose. Records of all permits and of construction are kept. The permit fees more than cover the cost of drafting, clerical and inspecting forces.

The Principles of a Uniform City Planning Code

The final session was devoted to this topic, and was presided over by Mr. Walter L. Fisher, Secretary of the Interior Department, Washington, D.C. The subject was introduced by Mr. A. W. Crawford, Assistant City Solicitor of Philadelphia, who stated that the Hartford Commission on City Planning affords a precedent which may well be followed elsewhere, especially as it does not create a new administrative body to usurp the powers of already existing city officials.

Although the subject given on the programme called for a planning code, Mr. Crawford stated that, in order to let each proposed grant of additional power to cities stand or fall (in the courts) by itself it had been thought best to submit a series of city planning acts, each dealing with separate subjects. Accordingly, one bill accompanying the paper (which was to a degree a report of the Committee on Legal and Administrative Methods) would permit cities to plot vacant areas and to reserve portions for public purposes without defining the use to which these reservations should be devoted. Another bill would authorize cities to place a limit on the heights of buildings in specified portions of the city. Still other acts contemplated would provide, among other things, for excess condemnation.

In discussing the topic for this session, Prof. Ernst Freund, of the University of Chicago Law School, recorded an objection to excess condemnation, either as a means of making profit for a city or of restricting the character of buildings adjacent to city improvements. He preferred an assessment of benefits for raising the cost of improvements, and he also preferred to condemn easements for restrictions on the use to be put to adjacent property. He did not believe in cities controlling the action of individuals as to the character of improvements made by them. He thought that a city planning commission should not be forced on a city, and that the powers of such commission should be advisory; also, that city planning commissions should have the authority to employ experts from outside their own city.

Mr. Frank B. Williams, of Hartford, Conn., and New York city, questioned whether in the formation of city plan commissions the aim should be to make a commission of experts wholly or in part. He said that as a rule men available for service on city planning commissions could not find the time to give unpaid expert services to the city, while in the smaller cities it was not always possible to find experts in the various lines. Mr. Williams also was of the opinion that it may be possible to do much good city planning or improvement work through the exercise of the health and police powers, especially as regards the relief of congested districts.

Mr. F. L. Olmstead said that the matter of restrictions on the development of the land by its owners might be subject to the local-option principle, under which a certain percentage of the property owners in a given district might agree on restrictions which would then become applicable to the district as a whole.

Mr. Thomas Adams remarked that the British Town Planning Act had for the first time introduced into legislation the word "amenity" in addition to health as an object to be attained through municipal action. Commenting on the remarks of the previous speaker to the effect that the City of Frankfort, Germany, has never yet exercised the much-advertised powers given it a few years ago to take small irregular tracts of land from private owners and reapportion them so as to give better building sites and improve the city plan. Mr. Adams remarked that in England it had been found that compulsory powers are necessary in order to secure friendly agreements.

The Increasing Height of Office Buildings

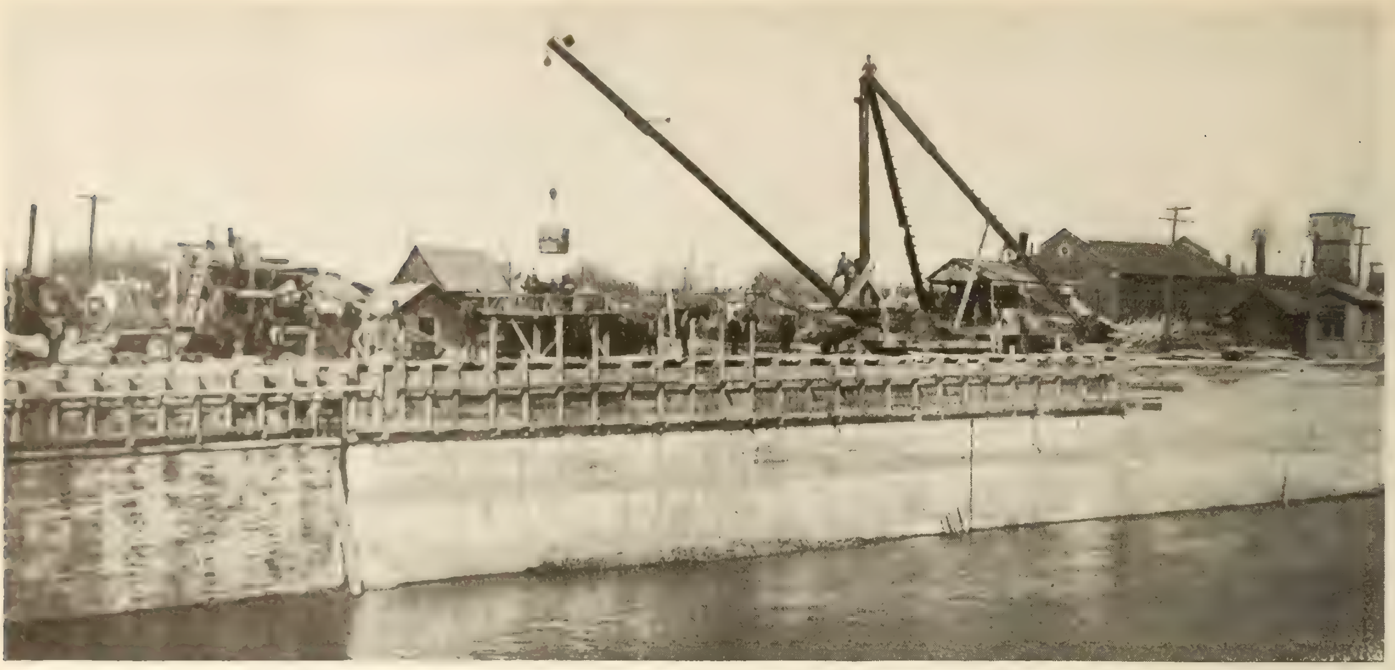
The construction of office buildings from twenty to thirty storeys high, some of them with towers of large dimensions nearly doubling their height, has ceased to be unique and calls for consideration of the type, says the Engineering Record. Many structural features of such buildings, carried to extremes, are illustrated in the Woolworth building, New York City, which will rise 840 ft. or more above the bottom of its deepest foundation, and will probably involve a total expenditure of over $10,000,000. Many things that are of importance in ordinary tall official buildings become grave problems in such a structure; their importance, complexity, and occasionally their novelty, require the most thorough investigation.

The best present practice reasonably safeguards life and adjacent property during the construction of the building, provides strength and stability for static loads and wind streses, and assuses protection against structural collapse from fire. But there are other qualities which are desirable in moderately tall buildings, although they have not generally been sufficiently considered, which become vital for these great towers. There should be, for example, special provision against structural deterioration from insidious causes like rust, electrolysis, fatigue of metal and possible abuse. Extreme precaution should be taken against the possibility of even the smallest piece of exterior stone, terra-cotta, tile or metal work becoming detached and falling from a great height to the street. Slight earthquake shocks are a matter of record even in New York, and it is not certain that more severe ones may not occur. While the well-braced framework necessary to withstand wind pressures would probably endure any seismic vibration not sufficient to wreck the whole city, these would be greatly magnified by the height of the structure, and might produce the most disastrous disintegration between the steel work and the walls and other portions of the structure. Ordinary fire precautions will not suffice. The protection system must, of course, be entirely independent of the street service, and while the structure itself may be entirely fireproof, every room in it is a potential furnace because it may be filled with inflammable material, and unless all exterior windows are safeguarded flames may, in spite of fireproof floors, corridors and shafts, pass rapidly from storey to storey by breaking out of the lower windows and into the upper ones. Tenants occupying the upper floors should be safeguarded not only from actual flames but from smoke, panic and disabled elevator service.

No absolute necessity for these very tall buildings is recognized. The plea has, of course, been for the utmost utilization of exceedingly costly ground space and on account of the great congestion of the business districts where they are located. So far as the latter consideration is concerned the cure aggravates the disease, because the added thousands of tenants greatly increase the pressure in the already crowded streets and by overtaxing the inadequate transportation facilities make bad conditions worse. Excessively tall buildings can be municipally desirable only under special conditions which will permit of suitable proportion, artistic treatment and effective display, as, for instance, where they can be located on adequate areas in parks, or occupy commanding squares with unimpeded vistas through approaching avenues. The construction of exceedingly tall buildings on small sites in narrow streets makes chimney-like monsters never really pleasing to the eye, injurious to the usefulness of the narrow streets and greatly depreciating adjacent property.

The principal advantages of the very tall buildings are the opportunities they provide for the concentration of large allied interests and the pleasant quarters afforded tenants in the upper storeys, where the light, air and view are superior to those of ordinary office buildings. Careful analyses and estimates made a number of years ago indicated that office buildings about sixteen storeys high yielded the maximum percentage of profit on investment in the financial district of New York. Although the profitable heights of buildings may have somewhat increased with increasing values of real estate, it is significant that many tall buildings have considerable unrented space, and that it is claimed that the average net revenue from them amounts to only about three per cent. on the total investment.

At Vancouver, B.C., all the affiliated trades connected with the Building Trades Council have threatened to go out on strike unless the Master Builders' Association meets the demands of the carpenters, who are asking $4.50 for an eight-hour day. Four thousand workmen are said to be associated with the Building Trades Council. Contractors state that at present they can get all the men they need. Large numbers of new arrivals continue to relieve the employers.



Fallon Bros.' Contract on the Cornwall Canal.—The completed concrete wall.

Cornwall Canal Improvement

Good progress is being made on the work of improving the upper entrance to Lock 17 of the Cornwall Canal, for which Messrs. Fallon Bros., of Cornwall, Ont., have the contract. The concrete wall, which extends some 700 feet from the lock, is completed, and steamboat men are now taking advantage of this long-felt want. The bottom for the cribs was prepared by dredging, and the material was cast over and saved to make the back fill after the wall was completed. The cribs were built of white pine to water level, and entirely covered with five feet of concrete. The gravel was fed to the concrete mixer by slush scraper and steam hoist, and the concrete was taken from the mixer in centre dump pier buckets and travelling derrick. Where the concrete was deposited over cribs at the outer end it was conveyed in side dump cars of English make, and hauled by another steam hoist. While 2,400 cubic yards of concrete were put into this work within twenty days, not one foot of gravel was shovelled by hand.

The waste weir on the south side of the canal to the river St. Lawrence, which is now about completed, is an exceptionally fine piece of work. It is the only entire concrete weir on the canal. At present the contractors are doing their back filling behind wall with a specially made scraper worked by steam hoist.

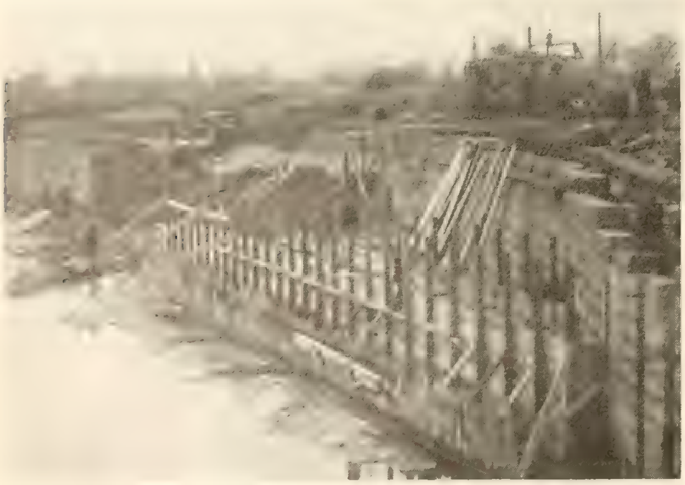
Messrs. Fallon Bros. have another contract of about the same nature at the upper entrance to Lock 19, and work will be commenced at once.

Mr. John H. Smythe is superintending the construction for the contractors.

An Example of Inadequate Specifications

The following sentence is copied from a set of specifications covering many different classes of work, the job for which they were used having a large amount of concrete construction: "Concrete shall be mixed in the manner prescribed by the engineer, and of such proportions as the engineer may direct."

It is needless to say that nothing could be more indefinite than this clause, yet even by following it injustices can be inflicted, says The Contractor. It would seem that when specifications are so indefinite that it would be better not to have any specifications to govern the work. But few would agree with this statement owing to the fact that although some class-



Cofferdam built and forms nearly ready for concrete

Track system for transporting contractors' material es of work might be poorly covered yet others may be described in great detail. In considering this clause we must first look into its origin.

No doubt such a clause was inserted in the specifications when concrete was but little used, and the amount of that class of work was always insignificant. In those days there were few, if any, mechanical mixers on the market, so that nearly all concrete was mixed by hand. Thus the contractor was to consult the engineer as to the method of mixing, that is, was sand and cement to be first mixed then water added, or was the concrete to be mixed dry, and then made wet, and how much water was to be used.

But with the introduction of many makes of mixers such questions were forgotten and the interpretation of the clause changed. The question to be decided was whether or not the concrete was to be mixed by hand or by machine, and if by the latter, what style of machine would be permitted. Here is where an injustice can be done the contractor. Under the specifications the engineer could prevent a mixer being used, compelling the contractor to mix all the concrete by hand, or if a mixer is allowed, the engineer could refuse to have on the job certain makes and styles of machines. These are not suppositions, but the editors of this journal have known of actual cases of these kinds, and contractors have been compelled to use methods and machines that made his work more expensive. This shows the necessary cutting out of specifications where the clauses have outlived their usefulness.

The second part of the provision quoted relates to the proportion of the materials to be incorporated in the concrete. Nothing affects the cost of concrete more than when the ingredients vary, and it is an easy matter to set forth the various proportions to be used. Even if the kind of structure to be built is not known, it is still possible to make the specifications definite. When it is not done the contractor is very apt to suffer. If he bids on a 1:3:5 mixture, it may be changed to a 1:2½:5 or even 1:2:4, and the cost will be increased. On the other hand the owner may be made to pay an excessive amount for the work, owing to this element of doubt.

A method in this connection, that is to be commended, is the dividing of the concrete work into classes, as Class A, Class B and so on. Thus the specifications can be definite as to each class, although on some work there may not be used concrete of certain classes, while if there is work to be done the specifications are explicit and the contractor has named a price for the work.

Some specifications go a step farther by providing for the different classes of concrete and obtaining a price on each class with forms and without forms. This is done to obtain more economical construction, and should be welcomed by contractors.

From these remarks it is evident that there should be no need of writing specifications as indefinite as those from which we have quoted.

Street Names on Concrete Curbs

Arkansas City, Kan., makes a practice of placing the street names on the top of the curb in the line of the sidewalk paving. The city owns a set of brass letters which are in charge of the city engineer, and these are loaned to the contractor to whom any curb and gutter work is awarded. These letters are brass, 3½ inches high and 1½ inches wide. With these the letters forming the street name are driven into the concrete while it is green, thus leaving the name depressed in the top face of the curb. These letters are sold by dealers in concrete workers' tools at from 15 to 25 cents each. Arkansas City has a population of 10,000 only. In a larger place where there is considerable amount of curb construction it would probably be profitable for each contractor to own his set of letters.

Estimating Buildings by the Square Foot

The subject of estimating the cost of a building at so much per cubic foot has received more or less attention in the trade press, with the result that a great diversity of opinion as to the merits of such a basis has developed.

The topic, however, has by no means been exhausted, and some interesting comments as to estimating the cost on a square foot basis are contributed by E. P. Hoerr to a recent issue of the National Builder.

The author states that every now and then we hear of a contractor and builder who estimates building on a cubic foot basis, using as the foundation of his estimates the cost per cubic foot of a contract he may have previously executed. Continuing he says:

"We are rather inclined to doubt the wisdom of estimating in this manner, for there are bound to be so many points at variance in the different buildings. These differences are, of course, considered, but is it not rather too much "guess work" to add or deduct here or there for these differences?

"Let us suppose, for instance, that a contractor kept close cost on a house just built by him; say it was a frame building 26 feet wide by 32 feet deep with gable style. The studs and joists were of yellow pine, likewise the sheathing and under floors. The foundation was of concrete, the cellar floor being also concreted. There were two porches, front and rear of concrete and wood. The interior finish was of plain red oak throughout, with plenty of cabinets, bookcases and mantels. The top floors were also of oak corresponding to the finish of the rooms. The cost of this house was, say 15c. per cubic foot.

"Now he has placed in his hands a set of plans where the house is 36 feet front by 30 feet deep, with peak roof. The specifications called for Northern lumber to be used in its construction. The foundation to be entirely of stone and the cellar floor to be concrete. Only one porch is to be built in the front entirely of wood. The interior finish to consist of birch, oak and yellow pine. There are to be cabinets, bookcases, etc., but entirely different in size and style from those on the other job. Naturally there were many smaller differences.

"We surely know that the same square foot basis would not hold good on the two houses, but is it possible to even use it as a basis, and take up differences by adding or deducting? Would it not be better to figure anew? Seems like a too uncertain way of doing so important a thing.

"It's true, of course, that estimating at its best is in a sense a guess. But let a man take up the various sections one by one, considering each part singly, then put them all together as a whole, and he will come much nearer to the right cost than if he took it up as a whole in the first place."

Specifications for Reinforced Concrete

The Standard Building Regulations Adopted by The Canadian Cement and Concrete Association — A Satisfactory, Well-Balanced Code

The following specifications were adopted by the Canadian Cement and Concrete Association at their last convention in Toronto and are published in the annual report and proceedings of the association. The members of the special committee which brought in these regulations were Messrs. Peter Gillespie, Gustave Kahn and C. R. Young, Toronto, and J. A. Jamieson, Montreal. The report contains, in addition, a number of valuable papers given at the meeting. Copies may be obtained from Mr. Snaith, secretary-treasurer of the association, 57 Adelaide street east, Toronto.

I. General

1. Height of buildings.—There shall be no fixed limit to the height of buildings of reinforced concrete except that arising from the requirements of these regulations.

2. Plans and computations.—Before permission is granted by the Building Department to erect any reinforced concrete building, complete plans, accompanied by specifications, signed by the engineer and architect, must be filed with the Building Department and remain on file for public inspection until the building is completed.

3. The Building Department shall have access to the computations. These shall give the various loads assumed, such as dead, live and wind loads, the impact allowance, if any, and the resulting maximum stresses.

4. Specifications.—The specilcations shall state the qualities of the materials to be used for making the concrete, and the density and strength required.

5. Certificate of carrying capacity.—Upon the completion of the building the engineer and architect shall issue, under the approval of the Building Department, signed certificates, to be posted on each floor of the building, stating the safe carrying capacity per square foot.

6. Records.—There shall be kept, for the inspection of the Building Department, careful records of the progress of the work. These records shall show the date of placing of all the concrete, the date of removal of the forms, and they must be turned over to the Building Department when the building is completed.

7. Walls.—Reinforced concrete walls may be used in place of brick or stone exterior or bearing walls with thickness reduced to two-thirds the thickness specified for brick walls. Such walls shall not be less than four (4) inches thick.

8. Reinforced concrete walls shall be reinforced at both faces. The maximum spacing of bars in the same vertical plane shall be 18 inches on centres. The quantity of metal employed shall be sufficient to provide for a uniformly distributed horizontal pressure of 30 pounds per square foot acting on either side of the wall.

II. Materials

9. Cement.—Only Portland cement shall be used in reinforced concrete structures which meets the requirements of the specifications of the Canadian Society of Civil Engineers.

10. Tests of the cement used in building operations shall be made from time to time under the supervision of the Building Department and in accordance with the preceding specifications.

11. Fine aggregates.—Fine aggregates shall consist of sand, crushed stone or gravel screenings graded from fine to coarse and passing, when dry, a screen of quarter-inch mesh. Not more than six per cent. shall pass a screen having 100 meshes to the lineal inch. They shall be of clean, silicious material free from vegetable loam or other deleterious matter.

12. Mortar.—Mortars composed of one part of Portland cement and three parts fine aggregate when made into briquettes shall show a tensile strength at least equal to the strength of 1:3 mortar of the same consistency and age made with the same cement and standard Ottawa sand.

13. Coarse aggregates.—Coarse aggregates shall consist of inert material graded in size, such as crushed stone or gravel, which is retained on a screen of quarter-inch mesh. The particles shall be clean, hard, durable and free from all deleterious material. The maximum size of the coarse aggregates shall be such that they will not separate from the mortar in laying and will flow readily around the reinforcement and into all parts of the forms.

14. Cinder concrete.—Cinder concrete shall not be used for reinforced concrete structures; it may be used for fireproofing. Where cinders are used as the coarse aggregate, they shall be composed of hard, clean, vitreous clinker, free from sulphides, unburned coal or ashes.

15. Medium steel.—Medium steel for reinforcement shall have an ultimate tensible strength of 58,000 to 66,000 pounds per square inch, an elastic limit of not less than onhalf the ultimate strength and a minimum percentage elongation in 8 inches of 1,500,000 divided by the ultimate strength. In all respects not covered by this specification, medium steel shall conform to the requirements of the general specifications for steel bridges and viaducts of the Department of Railways and Canals, Canada, 1908.

16. High elastic limit steel.—High elastic limit steel for reinforcement shall be made entirely from new billets and shall have an ultimate tensile strength of 80,000 to 96,000 pounds per square inch, an elastic limit of at least half the ultimate strength, and a minimum elongation in eight inches of 1,200,000 divided by the ultimate strength. It shall bend cold 180 degrees around a pin the diameter of which is four times the thickness of the bar without showing fracture on the outside of the bend.

17. Rust, scale and dirt.—All loose rust, scale or dirt shall be removed from reinforcement steel before it is placed in the work.

III. Design

1. General Assumptions

18. The ratio between the moduli of elasticity of steel and concrete shall, for a concrete crushing at 2,000 pounds per square inch in 28 days, be assumed at 15.

19. The compressive stresses in a reinforced concrete beam shall be assumed to vary directly as the distance from the neutral axis.

20. The tensile resistance of concrete shall be assumed to be zero.

21. T. Beams.—Where adequate bond between slab and web of beam is provided, the slab may be considered as an

integral part of the beam, and its effective width may be determined by the following rules:

(a) It shall not exceed one-fourth of the span length of the beam.

(b) Its overhanging width on either side of the web shall not exceed four times the thickness of the slab, nor twice the thickness of the web.

(c) Where the slab extends on only one side of the beam, it shall be permissible to consider as effective flange area, an overhanging width not greater than four times the thickness of the slab or twice the thickness of the web.

2. Bending Moments

22. Moments on slabs and beams.—In computing the positive and negative moments in beams and slabs, continuous over several supports, due to uniformly distributed loads, the following rules are recommended:

(a) That for floor slabs the bending moments at centre and at support be taken at $\frac{w l^2}{12}$ for both dead and live loads, where w represents the load per lineal unit and l the span length.

(b) That for beams the bending moment at centre and at support for interior spans be taken at $\frac{w l^2}{12}$ and for end spans be taken at $\frac{w l}{10}$ for centre and adjoining support, for both dead and live loads.

23. Distribution of loads on slabs.—Floor slabs shall be designed and reinforced as continuous over the supports. The distribution of loads longitudinally and traversely in slabs reinforced in both directions shall be determined by the following formula:

$$r = L^4 \div (L^4 + B^4)$$

where r is the ratio of the load carried transversely to the whole load, L is the length and B the bredth of the slab. If the length of the slab exceeds 1.5 times its width, the entire load shall be assumed to be carried by the transverse reinforcement. Square slabs are preferably reinforced in both directions using reinforcement in each direction calculated for one-half the specified load.

24. Distribution of loads on beams.—The loads carried to beams by slabs which are reinforced in two directions will not be uniformly distributed to the supporting beams, but may be assumed to vary as the ordinates on the sides of an isosceles triangle, the base of which is the length of the beam. The moments in the beams should be calculated accordingly.

3. Working Stresses

25. The working stresses proposed below are for a concrete the ultimate crushing strength of which at an age of 28 days is 2,000 pounds per square inch. For concrete of greater or less compressive strength, proportionate increments to, or reductions from, the proposed stresses shall be made.

(a) Bending.—The maximum allowable compressive stress on the extreme fibre of beams shall be 650 pounds per square inch.

(b) Direct compression.—The maximum allowable compressive stress on concrete in columns without hoops, or in columns reinforced with less than one per cent. of hooping, shall be 500 pounds per square inch.

(c) Pure shear.—Pure shearing stress uncombined with tension or compression shall not exceed 120 pounds per square inch.

(d) Diagonal tension.—Shearing stress combined with diagonal tension shall not be greater than 40 pounds per square inch.

(e) Bond.—The maximum allowable bond stress between concrete and plain steel shall be 60 pounds per square inch, and between concrete and deformed bars approved by the architect or engineer, 120 pounds per square inch.

(f) Tension in steel.—The tensible stress on steel reinforcement shall not exceed one-half of the elastic limit of the steel nor in any case 16,000 pounds per square inch.

(g) Columns.—Columns reinforced with longitudinal reinforcement only, shall be figured for a working stress in the concrete of 500 pounds per square inch and in steel, a stress of 7,500 pounds per square inch.

(h) Columns with at least one per cent. of reinforcement in the form of bands or hoops shall be figured at a working stress of 500 pounds per square inch on the concrete.

(i) Columns reinforced with at least one per cent. and not more than four per cent. of longitudinal bars and with at least one per cent. of reinforcement in the form of bands or hoops, or with structural steel column units which thoroughly encase the concrete core, shall be figured at working stresses of 650 pounds per square inch on the concrete and 9,750 pounds per square inch on the longitudinal reinforcement.

4. Details of Design

26. Spacing of bars.—The lateral spacing of bars should not be less than three diameters, centre to centre, nor should the distance from the side of the beam to the centre of the nearest bar be less than two diameters. The clear spacing between two layers of bars should not be less than one inch. In no case shall the minimum thickness of fireproofing be less than that specified by the Building Department.

27. Web reinforcement.—In the calculation of web reinforcement to provide a strength of 120 pounds per square inch, which is assumed to be the maximum permissible vertical shearing stress on beams no matter how well reinforced for diagonal tension, the concrete may be counted upon as carrying one-third of the shear, or for 2,000 pound—concrete, 40 pounds per square inch. The remainder may be provided for by means of metal reinforcement consisting of bent bars or stirrups, but preferably both. The area of a stirrup, acting in tension, must be proportioned to the force equal to the whole horizontal shear produced between the two adjacent stirrups less the amount to be carried by the concrete. This total horizontal shear may be found by multiplying the distance between the stirrups by the average horizontal unit shear, which is equal to the vertical unit shear and is represented by the expression $\frac{V}{d}$, where V is the total vertical shear not carried by the concrete and d is the depth of the beam to the centre of the steel. In accordance with this method, the stress is a vertical stirrup will be equal to $\frac{V s}{d}$ and in a stirrup or rod bent at 45 degrees it will be $0.7\frac{V}{d}$, in which s is the horizontal spacing of stirrups or bent rods in the direction of the axis of the beam.

28. Stirrups.—The longitudinal spacing of stirrups shall be such that at least one rod shall intersect below the centre

of the beam any 45° line of rupture in the portion of the beam where the shearing stresses exceed the allowable shearing value of the concrete.

29. Length of columns.—The ratio of unsupported length of columns to their least width shall be limited to fifteen.

30. Area of hooped columns.—The effective area of the hooped column shall be taken to be the area within the protective covering which shall not be less than two inches in thickness. In the case of columns reinforced with structural shapes, it shall be taken as the area wholly within the structural shapes.

31. Longitudinal reinforcement.—Bars composing longitudinal reinforcement must be straight and shall have sufficient lateral support to hold them securely in place until the concrete is placed.

32. Hooping.—The clear spacing of bands or hoops shall not be greater than one-eighth the diameter of the enclosed column. Adequate means must be provided to hold bands or hoops in place so as to form a column, the core of which shall be straight and well centred.

33. Bending stresses.—Bending stresses due to eccentric loads must be provided for by increasing the section until the maximum stress does not exceed the values specified above.

34. Bases of Columns.—At the bases of columns, longitudinal reinforcement shall abut squarely on bearing plates, or shall be carried into the footing a sufficient distance to develop the compressive stress in the reinforcement on the basis of the working stresses specified above.

35. Splicing of reinforcement.—In columns, all longitudinal reinforcing rods shall be properly butted or spliced.

36. Wherever it is necessary to splice reinforcement by means of lapping, the length of the lap shall be determined upon the basis of the safe bond stress and the stress in the bar at the point of splice; or, a connection shall be made between the bars of sufficient strength to carry the stress. Splices at the point of maximum stress must be avoided.

37. Shrinkage and temperature changes.—Where large areas of concrete are exposed to atmospheric conditions, the changes of form due to shrinkage and variation of temperature must be provided for by placing small rods or light fabric near the exposed surface, of a quantity to be determined on the basis of the elastic and thermal properties of the materials.

IV. Construction

38. Measuring and mixing of ingredients.—The ingredients of concrete shall be thoroughly mixed to the desired consistency, and the mixing shall continue until the cement is uniformly distributed and the mass is homogenous and uniform in color.

39. Methods of measuring and proportioning the ingredients shall be such as are approved by the engineer or architect.

40. When the conditions will permit, a machine mixer of a type which insures the uniform distribution of the materials throughout the mass shall be used.

41. When it necessary to mix by hand, the mixing shall be on a water-tight platform, and special precautions must be taken to turn the materials until they are homogeneous in appearance and color.

42. Consistency.—The materials must be mixed wet enough to produce a concrete of such consistency as will flow readily into the forms and about the reinforcement, and which, on the other hand, can be conveyed from the mixer to the forms without separation of the coarse aggregate from the mortar.

43. Retempering.—Retempering mortar or concrete, i. e., remixing with water after it has partially set shall not be permitted.

44. Placing of concrete.—Concrete shall be rapidly and continuously handled from the time the water is added until it is finally placed in the work. The placing shall be fascilitated by the use of suitable agitating and ramming tools so as to produce a thoroughly compact concrete of maximum density.

45. Wetting.—Concrete exposed to premature drying shall be kept damp for a period of at least four days.

46. Forms.—Before concrete is placed, care shall be taken to see that the forms are substantial and thoroughly wetted and that the space is entirely free from debris.

47. Joining up new work to old.—When work is resumed, concrete previously placed shall be roughened, thoroughly cleaned of foreign material and laitance, drenched and slushed with a mortar consisting of one part Portland cement and not more than two parts fine aggregate.

48. Placing in water.—Where concrete must be placed under water, unusual care must be taken to prevent the cement from being washed away.

49. Freezing temperature.—Concrete should not be mixed or deposited at a temperature lower than 28 degrees Fahr. unless special precautions are taken to avoid the use of materials containing frost or covered with ice crystals, and to provide means to prevent the concrete from freezing after being placed in position.

50. Reinforcement.—The reinforcement shall be accurately located in the forms as required by the plans and carefully secured by wiring or other means against displacement before placing the concrete.

51. Joints.—Reinforced concrete work shall be stopped at points where joints will have the least possible effect on the strength of the structure.

(a) Footings shall, where practicable, be cast to their full depth at one operation.

(b) Columns shall be cast at a single operation and work shall be stopped at the underside of the lowest beams or girders bearing on the columns. Where a bracket is used, the bracket shall be considered a part of the beam or girder.

(c) Construction joints in beams and girders shall be vertical and at the centre of the span. Any concrete which may run past the bulkheads must be cleaned up before the concreting of the next section is started.

(d) Construction joints in slabs shall be at the centre of the span. Where a joint occurs between a slab and a beam or girder, no T-action in figuring the beam or girder shall be considered.

52. Removal of forms.—No forms shall be removed without the written consent of the engineer or architect.

53. Tile and joist construction.—Wherever floors are built with a combination of tile or other fillers between joints, the following rules regarding the dimensions and methods of calculation shall be observed.

(a) The ratio of minimum depth to clear span of joist shall not be less than one to twenty-four.

(b) Wherever a portion of the slab above the tile joist shall be considered as acting as a Tee-beam section, the slab portions must be cast monolithic with the joist and must have a minimum thickness of 2 inches. In such a case all regulations applying to Tee-beams shall apply to tile and joist construction.

(c) In no case shall the tile or other fillers be considered as bearing stress.

(d) Wherever porous tiles, or other materials which by their nature will absorb water from the concrete, are used between the joists, care must be taken to thoroughly saturate the tiles, or other materials, with water immediately before the concrete is placed.

Standard Specifications for Tests of Drain Tile and Sewer Pipe

The following specifications were recommended by the Engineering Experiment Station of the Iowa State College, and adopted by the Association of Iowa Cement Users, the Iowa Brick and Tile Manufacturers' Association, the Iowa Drainage Association and the Iowa Engineering Society.

Specifications for Standard Absorbtion Tests

1. **Specimens.** The specimens shall be each approximately three inches square, and shall extend the full thickness of the pipe wall, with the outer skins unbroken.

2. **Number of Test Specimens.** Five individual tests shall constitute a standard test, the average of five, and the result for each specimen, being given in the report of the test.

3. **Drying Specimens.** Each specimen shall be dried in an oven or by other application of artificial heat, until it ceases to lose further appreciable amounts of moisture when repeatedly weighed.

4. **Brushing Specimens.** All surfaces of the specimens shall be brushed with a stiff brush before weighing the first time.

5. **Weighing.** The specimens shall be weighed before immersion, on a balance or scales capable of accurately indicating the weight within one-tenth of one per cent.

6. **Water for Standard Test.** The water employed in the standard absorption test shall be pure soft water, at the air temperature of a room which is artificially heated in cold seasons of the year.

7. **Immersion of Specimens.** The specimens shall be completely immersed in water for a period of 24 hours.

8. **Re-weighing.** Immediately upon being removed from the water, the specimens shall be dried by pressing against them a soft cloth or a piece of blotting paper. There shall be no rubbing or brushing of the specimens. The re-weighing shall be done with a balance or scales capable of accurately indicating the weight within one-tenth of one per cent.

9. **Calculation of Result.** The result of each absorption test shall be calculated by taking the difference between the initial dry weight and the final weight and dividing the remainder by the initial dry weight.

Standard Tests of Bearing Strength

1. **Specimens.** The specimens shall be unbroken, full sized samples of the pipe to be tested. They shall be carefully selected so as to represent fairly the quality of the pipe.

2. **Number of Specimens.** Five individual tests shall constitute a standard test, the average of the five and the result of each specimen being given in the report of the test.

3. **Drying.** The specimens shall be dried by keeping them in a warm, dry room for a period of at least two days prior to the test.

4. **Weighing.** Each dried specimen shall be weighed on a reliable platform scale just prior to the test.

5. **Bedding of Specimen for Test.** Each specimen shall be accurately marked with pencil or crayon lines, in quarters, prior to the test. Specimens shall be carefully bedded above and below in sand for one-fourth of the circumference of the pipe, measured on the middle line of the tile wall. The depth of bedding above and below the tile at the thinnest point shall be equal to one-fourth the diameter of the pipe, measured between the middle lines of the tile walls.

6. **Top Bearing.** The top bearing frame shall not be allowed to come in contact with the tile or with the test load. The upper surface of the sand in the top bearing shall be carefully struck level with a straight edge, and shall be carefully covered with a heavy, rigid top bearing, with lower surface a true plane, made of heavy timbers, or other rigid material capable of uniformly distributing the test load without any appreciable bending. The test load shall be applied at the exact centre of this top bearing in such a way, either by the use of a spherical bearing, or by the use of two rollers or rods at right angles, as to leave the bearing free to move in both directions. In case the test is made without the use of a machine, and by piling on weight, the weight may be piled directly on a platform resting on the top bearing, provided, however, that the weight does not touch the top frame holding the sand, and provided, further, that the weight is piled in such a way as to insure uniform distribution of the load over the top surface of the sand.

7. **Frames for Top and Bottom Bearings.** The frames for the top and bottom bearings shall be composed of timbers so heavy as to avoid any appreciable bending by the side pressure of the sand. The frames shall be composed of timbers so heavy as to avoid any appreciable bending by the side pressure of the sand. The frames shall be dressed on their interior surfaces. No frames shall come in contact with the tile during the test. A strip of soft cloth may be attached to the inside of the upper frame on each side along the lower edge to prevent the escape of sand between the frames and the tile.

8. **Sand in Bearings.** The sand used for bedding the tile at top and bottom shall be washed sand which has passed a No. 8 screen. It shall be dried by keeping it spread out in a warm, dry room.

9. **Application of Load.** The test load shall be applied gradually and without shock or disturbance of the tile. The application of the load shall be carried on continuously, and the tile shall not be allowed to stand any considerable length of time under a load smaller than the breaking load.

10. **Calculation of Bearing Load.** The total breaking load shall be taken as equal to the total top load, including the weight of top frame, sand for top bearing, top bearing timbers, etc., plus five-eighths of the weight of the pipe. This total load shall be divided by the length of the pipe in feet so as to give the bearing strength per linear foot of pipe.

Calculating the Modulus of Rupture

The modulus of rupture for drain tile and sewer pipe shall be computed from the results of the standard test for bearing strength, according to the following rule:

Divide the bearing strength per linear foot by 12, multiply the quotient by the radius of the middle line of the tile wall expressed in inches, and divide this product by the square of the minimum thickness of the tile wall at top or bottom, also expressed in inches. This quotient will be the modulus of rupture of the pipe expressed in pounds per square inch.

Among the many different brands of waterproofing materials now on the market, the H. W. Johns-Manville Company, 100 William street, New York, are offering a line of fabrics, felts, cements and coatings known as J-M waterproofing materials. These materials, which are the result of this firm's half century of experience, careful study and unexcelled facilities, are especially made to meet every condition in waterproof building construction and have been effectively used for waterproofing underground tunnels, walls of brick and concrete buildings, dams, reservoirs, swimming pools, etc., with much success. The Johns-Manville concern has issued a little booklet explaining fully the merits of their waterproofing materials, which they will gladly mail to anyone on request.

Personal News and Notes

Wm. Robinson, C.E., of Owen Sound, died last week in his [illegible] year.

A [illegible] day and 50 cents an hour is the basis of an agreement effected between the carpenters of Calgary, Alta., and the Builders' Exchange of that city.

Mr. W. Hollingsworth, a well known member of the city's engineering staff at Toronto, has been appointed assistant engineer at Hamilton, Ont., at a salary of $2,000 a year.

The Toronto board of control has made City Architect McCallum a grant of $2,600 to engage two inspectors for structural iron work. The appointments will only be temporary.

Mr. D. J. McKenzie, of Ottawa, dealer in builders' supplies, at Ottawa, has amalgamated with Standard Supplies, Limited, and will be Managing-Director of that company with office and warehouse at 106 Bank street.

The city of Lethbridge, Alta., is having a deluge of applications for the vacant post of city engineer. According to a recent dispatch from that city over 100 have applied for the job. The salaries asked range from $1,200 to $7,000 a year.

The Montreal press records how City Engineer Janin was struck by lightning last week, since when, according to the dispatch, he has enjoyed improved health. Evidently shocks of this kind are mild in comparison with those received within the precincts of the council chamber.

Mr. Stanley Mitton, architect, 413 Granville street, Vancouver, B.C., has been holding an exhibition in his studios. The possibilities of various materials have been demonstrated and complete schemes shown for buildings of various classes. Mr. Mitton is making this an annual feature of his business.

At Hamilton, Ont., last month 230 perimts were issued for buildings aggregating in value $539,005. The total for May, 1910, was $202,625. The detailed statement shows that 116 brick dwellings were erected at a cost of $262,200; 78 frame dwellings costing $73,750; 2 factories, $65,000; 8 store buildings, $56,900.

The ratepayers of Cranbrook, B. C., have decided in favor of the installation of a sewerage system and a sewage disposal works at a cost of $100,000. The work will be proceded with immediately and will be carried out by day labor under the supervision of the John Galt Engineering Company, of Winnipeg.

The Grand Trunk Pacific are stated to have approved plans for the proposed new Selkirk Hotel, which is to be erected in Winnipeg at a cost of $1,000,000. The latest information to hand is that the architects, Messrs. Ross & MacFarlane, are now working on the detail plans and that construction is to commence forthwith.

According to our Vancouver correspondent the friction between the contractors and the carpenters in that city last month was offset considerably by the bad weather. From the 1st of the month to the 20th, he states, there were only three actual working days on account of the rain. This constituting the wettest May on record at Vancouver.

At Ottawa the final plans for the new departmental block are again delayed owing to the absence of the Prime Minister. This means holding the work over for another year. The latest suggestion is that the buildings be placed on the east side of Sussex street. A number of influential people are supporting the scheme and it will probably receive some consideration. Otherwise it was hoped to commence building operations in July.

The Standard Construction Company, Toronto, is suing E. A. Walberg for $16,000 for the construction of eight miles of transmission line, which has been laid between the Mines Power Company's power house on the Maddabitima River and Cobalt. A contract was entered into for the construction of 25 miles of a line for $19,000, but after the building of eight miles the plaintiffs ceased work, claiming that the defendant obstructed them. The case is proceeding.

At Montreal considerable interest is being taken in the selection of paving material for extensive work which is to be paid for by property owners. It has been pointed out that the city, with a larger population than Toronto, has less than one-fifth the quantity of permanent paving, aside from the fact that the work in the latter city is superior. It would seem that a little good missionary work might be accomplished at this stage by some of the enterprising paving concerns.

Mr. Thomas J. Drummond, of Montreal, president of the Canada Iron Corporation, Limited, is in Europe on a trip combining business with pleasure. He is accompanied by Mrs. Drummond, their son Louis, and Master Gerald Drummond, son of Mr. George E. Drummond. They expect to be away two months. Mr. Drummond is one of the six delegates appointed by the Iron and Steel Institute of America to attend the conference of the iron and steel manufacturers of the world in Brussels early in July.

J. W. Stewart, of Foley, Welch & Stewart, returned recently to Prince Rupert, after a visit of inspection over G. T. P. construction at Skeena river. Good progress is being made on the work. The tunneling beyond Kitselas is being prosecuted expeditiously and the sinking of the caissons for the Skeena river bridge is preceeding without any serious difficulty. Mr. Stewart was to leave in a few days for Edmonton, from which point he proposed to inspect the progress of the work as far as it had been proceeded with by his company.

The Consolidated Plate Glass Company of Canada, Limited, are building a new warhouse and factory in Winnipeg, on Barmoral street, near Portage avenue. The building will be 167 by 50 feet, four storeys and basement. It is expected to be finished about July 1. Mr. J. E. Wilson, who has been with the company in Toronto for the last seven years, will have charge of the Winnipeg branch. Good progress is being made on the new general offices, factory and warehouse on Spadina avenue, Toronto, and the company expect to remove at an early date.

A Made-in-Canada Fair Building was erected recently at Vancouver, in one day, by union labor. Three hundred carpenters put 125,000 feet of lumber into place in six and one-half hours. The dimensions of the building are 60 x 252 feet. An incidental item in the construction was the erection of a fence 1,200 feet in length and 9 feet high. Upwards of one and one-half tons of nails were used. The building covers over 1,500 feet of floor space. According to the Vancouver World, to whom we are indebted for the above details, 10,000 citizens witnessed this notable feat.

Trouble is brewing in the ranks of the men employed in the erection of steel work on some of the large buildings now going up at Montreal. Reports state that the men consider this a good time to demand higher wages, and that a strike is in prospect if their demand is not complied with. The trouble may be smoothed over or fought out, but at the present writing there is considerable apprehension regarding the outcome in local building circles. There is much work to be done and capable men are not over plentiful, so it is hard to form any idea as to what the result will be if the men made a determined stand for more pay.

The Sandstone, Brick & Sewer Pipe Company (head offices Calgary), are putting up a new plant at Sandstone, Alta., twenty miles from Calgary. Operations will be commenced early in July. Temporary kilns will be built this year and the output during 1911 will consequently be limited to 500,000 brick a week. Continuous kilns will be put in next year, however, when it is expected to increase the output to one million bricks a week. The manufacture of sewer pipe, terra cotta, etc., will also be added next year. The manager of the concern is Mr. F. Prendergast, formerly connected with the Alberta Portland Cement Company.

Arthur J. Barclay, Licentiate R.I.B.A., Toronto, has obtained an appointment as architect with the Department of Public Works at Ottawa. Mr. Barclay is a medallist of the Royal Institute of British Architects and came to Canada a few years ago from Montrose, Scotland, where he enjoyed an excellent reputation in the profession. Among his most recent successes in Ontario is the award of first place in the competition for plans for municipal buildings and fire station at Goderich, Ont. The town of Goderich hopes to retain Mr. Barclay as consulting architect on this work. Meantime communications regarding it may be addressed to Mr. Barclay at 294 Bathurst street, Toronto.

Mayor Drouin, of Quebec, accompanied by Mr. W. D. Baillarge, returned recently to the ancient capital after a visit to Montreal, Toronto and Boston, undertaken for the purpose of inspecting the various paving works in those cities. Upon his return the Mayor of Quebec told the council that he had never seen streets kept in such a perfect condition as those in Toronto. While in the United States Messrs. Drouin and Baillarge paid a visit to the Hassam Paving Company's great works at Worcester, Mass., and were most favorably impressed with the product of that concern. As previously announced in these columns the city of Quebec has been authorized to expend $400,000 on paving work this season. Tenders for a considerable portion of the work have now been submitted. At date of writing they are in the hands of the city engineer for report.

Several leading American railway contractors were in Edmonton last week sizing up their prospects for a share of contracts aggregating about $15,000,000. Tenders were due to be opened last Friday for the building of a 160-mile section of the C. N. R. from Kamloops to Hope, through the Fraser riven canyon. Among the visitors were A. R. Porter, of Porter Bros., Spokane and Portland; Martin Woolson, of Woolson & Cochrane, St. Paul; W. A. Winston, of Winston Bros., St. Paul; and P. Welch, of Foley, Welch & Stewart. Mr. Porter stated that it was his firm's intention to establish in Canada. He stated that in the coast states there was no work in sight and thousands of men were idle. Mr. Porter is a native of Nova Scotia and he considers that he has a right to return to the country for a living now that development is beginning to pan out in the States.

After completing arrangements for the shipment of a quantity of asphalt from Fort McMurray, to be used for experimental purposes in paving in Edmonton streets, to demonstrate the utility of deposits in the north country, J. K. Cornwall, M.L.A., returned to Edmonton last week from Athabasca Landing. The asphalt will be placed in sacks and loaded at Fort McMurray on the Hudson's Bay company's boats for transportation to Grand Rapids. From here it will be brought to Athabasca Landing on a steamer of the Northern Navigation company, and will be freighted from the Landing to Edmonton, reaching there about June 15th.

J. S. Irvin, Ottawa—One of the Pioneers of the Canadian Cement Industry

Perhaps no one man has done more for the cement industry in this country than Joseph S. Irvin, of Ottawa. Many of the largest factories in North America owe their existence to him, and the industry in general is indebted to him for many improvements which have resulted from his constant endeavor to effect improvements in this field. He was identified with the introduction into Canada of the dry method of manufacturing cement. He was also instrumental in bringing the first block machine into Canada and was among the most energetic advocates of reinforced concrete at the experimental stage of that construction. In the negotiations which resulted in the merger of the leading Portland cement companies and the organization of the Canada Cement Company he took an active part.

When, in 1901, he entered the Canadian field of the Portland cement industry it had three great requirements. One, was a man with organizing ability to form companies and secure capital from somewhat conservative investors. Another, was a man with mechanical training necessary to build the right kind of factories to produce high grade cement at low cost. The third was a campaign to impress upon the people of Canada the advantages of cement construction, against which, at this time, there was yet considerable public prejudice.

Mr. Joseph S. Irvin of Ottawa.

Fortunately for the industry, the pioneers in the cement business found Mr. Irvin a man possessing all these requisites. If there was any doubt of it at the time, after years have amply fulfilled the hopes of those who first invested under his leadership.

It is interesting to follow how quite unconsciously his natural gifts were trained in early years for just such a position as he now occupies. When a young man he entered the employ of a big harvesting company at Plano, Ill. He was naturally a machinist and in a few years he could build any part of a grain binder; but he was naturally an organizer, as well, and in a short time the company appointed him travelling organizer and expert. When twenty-one he was general manager of Michigan and Northern Indiana, with from twenty-five to fifty travelling salesmen and over three hundred agencies under his supervision. He remained in this line of activity with marked success for some years. His observations, however, had impressed upon him the growing importance of the Portland cement industry, and refusing a tempting offer to become general manager for Northern Michigan for the McCormick Reaper Company, he became associated with this field in 1898, distinguishing himself at once in the organization and development of the Peninsula Portland Cement Company, of which he was elected a director. The Peninsular Company's plant was at Cement City, Mich., and in due course this received a visit from a Canadian deputation which had been appointed to make careful investigations in the United States with a view to effecting improvements in the industry at home. This visit resulted in Mr. Irvin's being induced to cross the border to assist in the organization of the National Portland Cement Company, at Durham, Ont. Later he returned to the United States and helped to organize the Southern States Portland Cement Company, at Atlanta, Ga., and the Western States Cement Company, at Independence, Kan. About this time he and his associates, appreciating the advantages of manufacturing cement by the dry process, decided upon the investigation of properties in Ontario and Quebec with a view to finding the proper materials and other conditions for the erection of a plant. This resulted in the organization of the International Portland Cement Company, and the erection in 1902 of a splendidly equipped plant at Hull, Que. A great demand ensued for the product of the plant, which was enlarged twice in four years.

The possibilities of Western Canada next attracted Mr. Irvin and those associated with him, who after going over the ground from Fort William to the Rockies, decided upon establishing a plant at Exshaw, Alta. This plant is up-to-date in every particular and contains all the improvements evolved from the other plants. His activities are unlimited and he is now organizing a company which will erect a plant at Spokane, Wash., which, when completed, will be one of the largest in the country.

Mr. Irvin's interest in the cement industry has not been confined exclusively to the consideration of dollars and cents. He undertook much of the pioneer work of introducing concrete construction throughout Canada and he has written a number of excellent articles and pamphlets setting forth the uses and advantages of cement. He has addressed public meetings and given demonstrations at the big exhibitions. In fact he has taken every available opportunity to promote the welfare and success of the industry in the broadest application.

He is a man of unswerving honesty of purpose, ever alive to opportunity, a man of untiring energy and an optimist all through; moreover, he is always genial and always approachable—indeed, much of his success as an organizer may be attributed to his magnetic personality.

Western Ontario Builders Organizing

The London Builders' Exchange sent a large delegation to St. Thomas last week to discuss with the exchange in that city the question of a more adequate organization of building interests. As a result of the discussion it was resolved that the officers of the London and St. Thomas exchanges should get into communication with contractors and supply dealers in all the cities and towns in Western Ontario districts and endeavor to have them organize local exchanges as early as possible. It was also resolved that the secretaries of the two exchanges represented at the meeting immediately communicate with the officers of the other exchanges in Western Ontario with the view of forming a provincial association of builders, prior to the meeting of the national convention, which will be held in Toronto in February, 1912. The representative director of the Canadian National Association for Western Ontario, Mr. E. R. Dennis, gave an interesting description of the itinerary of the delegates to the convention held in Winnipeg last February, and a synopsis of the most important business transacted at the Winnipeg convention. He was followed by Messrs. Martyn, Jones and Gould, of London, who touched upon some of the practical methods to be derived by affiliation with the national association.

The St. Thomas exchange has made excellent progress since its organization a few months ago. Its quarters are centrally located and are well equipped for carrying on the work.

Trade News from Montreal

Mr. George W. Goodbody is the contractor for an addition to the Engineers' Armory at Point St. Charles.

Messrs. O Martineau & Son, Limited, are building eight three-storey houses on St. Denis street at a cost of $24,000.

Messrs. Sparrow & MacNeil, general contractors, Montreal, have moved into their new offices at No. 12 Beaver Hall Square.

Splendid progress is being made by Mr. E. G. M. Cape, contractor, who has the construction for the extension to Fairmount avenue school. The roof will soon be on.

Mr. F. P. Jones, manager of the Canada Cement Company, denies the statement published in Winnipeg that the price of cement is about to be increased. He says if there is any change it will be lowered.

The council of the municipality of Laprairie has decided to pay its share of the cost of constructing the highway between St. Lambert and Rouse's Point, this being a section of the Quebec to New York highway.

The managers of St. Giles Presbyterian Church have purchased a lot at the corner of Boulevard St. Joseph and Nelson street on which they will erect a new church edifice. It is not know when work on the new church will be commenced as the management have not yet appointed their architect.

In one week recently building permits to the value of $33,000 were issued by the Building Inspector in the town of Outremont, Montreal. The largest structures were semi-detached cottages on Rockland avenue, for Mr. A. Lesserette, and on St. Viateur street for Mr. A. Paissent, at $10,000 each.

The Standard Ideal Company, of Montreal, have moved from Notre Dame street to No. 44 Beaver Hall Hill where extensive alterations are being made to the premises, which when completed will give them one of the finest show rooms in the city for the display of modern sanitary furnishings manufactured by this company.

Good progress is being made on the central building of the Y. M. C. A. on Drummond street, and the Westmount and Fairmount branches. If the work continues under as favorable conditions as have prevailed hitherto, the architects expect both branches to be completed by November or December, and the headquarters to be ready for opening by March, 1912.

For some days past workmen have been employed in taking down the upper storeys of the old Y. M. C. A. building at the corner of Craig street and Victoria square. Last fall this building was condemned owing to some defect in the foundation. It is stated that a temporary roof will be erected over the ground floor and that the Shedden Forwarding Company, which was obliged to move out along with other occupants when the building was condemned, will return to occupy the premises temporarily.

The management of the Windsor Hotel have commenced the demolition of the Synagogue Temple Emmanuel, which they recently purchased from a Hebrew congregation in Stanley street, and will shortly begin the construction of a power house and laundry on the site. The large boilers and heating apparatus will be removed from the basement of the hotel into the new structure just across the street. Good progress is being made on the new Synagogue which is being built in Westmount for the use of this congregation.

Over 600 men are now hard at work on the new elevator being erected by the Montreal Harbor Commission. Streams of liquid concrete are being poured into the moulds of the substructure. The second storey has been begun and the walls are rising in sections of about six feet, the frames or forms being raised to a new elevation as fast as the last section laid becomes hard enough to permit being built upon by the next section. This elevator, when completed, will have a capacity of some $2,000,000 bushels, which is considerably larger than the Commissioners' elevator No. 1. or the Grand Trunk elevator at Wind Mills Point.

The steel frame work of the Dominion Express building at the corner of St. James and St. Francois Xavier streets is now up almost to its full height, in fact part of the frame work has reached the height of the roof. The Structural Steel Company, Limited, which has the contract for supplying and erecting the steel work of this building, made almost a record by placing the frame work of the first eight storeys inside of about ten days. The total height will be ten storeys above the St. James street level and three storeys below. Owing to the pergola style of roof which will be put on the building, the frame work cannot be completed for a few weeks, but the work so far has been very satisfactory.

In connection with the extension of the Victoria pier in the Montreal harbor it was found that the distance between the end of this pier and that of the guard pier would be less than 1,000 feet, which is the required distance between the end of the piers and any other obstruction. Consequently the Harbor commissioners have decided to cut a piece off the east end of the guard pier and extend it towards the south shore. This will give the required distance between the piers and at the same time the turning of the guard pier will have the effect of diverting the strong current which hitherto has existed at this point farther out into the river. This will considerably lessen the current in the harbor and make it much easier for ships to berth at the Victoria and other piers on the harbor front. Work has already been commenced on the guard pier. The construction will be held together by a rip-rap which is expected to be strong enough to resist the force of the current at any time of the year.

Rumors continue to be circulated to the effect that the Canadian Northern Railway Company are purchasing a large area of land in the vicinity of St. Catherine and Bleury street for terminal purposes. Officials of the company in Montreal say they know nothing about such deals, and the statement has been made that it would be impracticable to have a railway station established south of St. Catherine street for the reason that they would have to go down to a very great depth so as to pass beneath the city's sewage system, and in any case they would be obliged to enter the city by tunnel under the mountain. By establishing their terminals in the vicinity of Ontario street, below Sherbrooke street at certain points they would be able to enter a tunnel practically on the level emerging on the north side of the mountain without too serious a grade. Certain very expensive real estate deals recently put through, involving the transfer of hundreds of acres of land between the mountain and the Back river, have been popularly connected with this railway terminal project. If the company have really bought the tract of land known as the Maher Boulevard they will have a right of way extending practically from Outremont to the Back river. For obvious reasons, however, neither the company nor the real estate dealers will make any statement in connection with these matters.

The Toronto building permits for last month totalled $2,643,755. This total is $773,455 in excess of May, 1910. Since Jan. 1st the permits aggregate $9,555,513, compared with $7,518,098 for the corresponding period of last year.

Good roads construction in York county will be in charge of the following officials: highway engineer, E. A. James; assistant and construction engineer, A. E. Edwards; bridge engineer, Frank Barber. The sum of $300,000 is to be expended upon the improvement of York county roads.

The management of the Dominion Carbolineum Works, Limited, of Vancouver, whose new and modern plant on the North Arm of the Fraser was recently described in these columns, have secured permission from the Registrar of Joint Stock Companies of British Columbia to change the firm name to "The Dominion Creosoting Company, Limited." This title better covers the nature of the business, which is constantly expanding. See advertisement elsewhere.

Mr. E. T. Dartnell, of Montreal, dealer in builders' supplies, has removed from 157 St. James street to 8 Beaver Hall Square. The new premises are commodious and splendidly adapted to the various lines carried by Mr. Dartnell, which include high grade face brick, tapestry brick, terra cotta fireproofing, floor quarries, and roofing tiles. One of the important orders for supplies received so far this season, calls for 160,000 white porcelain tiles to be used in the exterior of the Dominion Express Building now being erected in that city from plans by Messrs. E. & W. S. Maxwell.

The Pulsometer Steam Pump Company, 17 Battery Place, New York City, have sent us a copy of their catalogue No. 17, descriptive of the Pulsometer, its operation, construction and field of application. The Pulsometer is claimed to be the simplest, handiest, most efficient and most durable steam pump known for general low service water raising purposes. It can be set up and taken down quickly, and it will operate practically without attention and will not be subject to interruptions or excessive wear due to gritty or muddy water. Contractors will do well to investigate its merits for trench draining and excavation.

"A Handy Book of Greenhouse Materials" is the title of a practical booklet published by M. Brennen & Sons Manufacturing Company, Limited, Hamilton, Ont., manufacturers of greenhouse construction materials and hot bed sash. One of the most important features in the manufacture of greenhouse material is the kind and quality of lumber used. The Brennen Company use white cork pine, exclusively, for the reason that it is less affected by atmospheric conditions than any other. Prospective builders of this type of work will do well to obtain figures from the firm

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Battleford, Sask.

Tenders are called until June 19th for material and construction of waterworks and sewerage system. Wm. Kitson, town engineer. Advertisement in "Tenders and For Sale Department" of this issue.

Cobourg, Ont.

Tenders addressed to D. H. Minaker, clerk, will be received until June 19th for construction of cement walks. Specifications at office of clerk. Estimated expenditure, $3,000.

Calgary, Alta.

A by-law is in course of preparation to construct a further 30,000 square feet of permanent paving.

Cannington, Ont.

Plans are being made for drainage system to cost about $3,000 for this village. Engineer in charge, Cavana & Watson, Orillia. Glazed pipe, 8 in. to 15 in. will be used, length, 3,400 feet.

Cardston, Alta.

By-law on gravity water system will be voted on early in July. Engineer, R. E. MacArthur, Lethbridge.

Foam Lake, Sask.

Tenders addressed to Thomas H. Rowley, secretary-treasurer, Foam Lake, Sask., will be received until June 15th for construction of cement sidewalks. Plans, etc., at office of the above.

Halifax, N.S.

Plans are being prepared by W. W. Doane, city engineer, for sewer system, $98,000. Part to be constructed this year, Cobourg Road and Oxford street.

Lacombe, Alta.

The construction of waterworks system for fire protection will commence at once.

Medicine Hat, Alta.

The $33,350 by-law for cement walks, $17,500 for curbs, gutters and boulevards, $40,000 for plank walks and $80,000 for grading were carried.

Moncton, N.B.

Tenders will be called for erection of pumping station in connection with waterworks system. John Edington, city engineer. Estimated cost, $16,000.

Tenders will probably close on June 18th for dam for waterworks, $85,000. J. Edington, city engineer.

Separate tenders received about July 1 for laying main water pipe, 18,000. J. Edington, city engineer.

Tenders will be received until about July 1st for excavation of trench for main pipe line for waterworks. Estimated cost, including laying of pipe, $75,000. John Edington, city engineer.

Tenders addressed to J. Edington, city engineer, will be received until June 5th for clearing right of way for pipe line for new reservoir.

Moose Jaw, Sask.

The $170,000 by-law for paving having been carried, contemplated improvements will be now made; $28,000 by-law for cement sidewalks, was also carried.

Montreal, Que.

Tenders addressed to Board of Commissioners will be received until June 12th for supply of artificial paving blocks and sidewalk and crossing flags. L. N. Senecal, secretary.

Tenders are also called until 15th June for construction of pavements, etc.

North Bay, Ont.

Tenders are called until June 15th for laying about 25,000 lin. feet of sewers, and furnishing certain materials therefor. Advertisement in "Tenders and For Sale Department" of this issue. T. N. Colgan, commissioner of works.

Tenders called until June 15th for supply of sewer pipe. T. N. Colgan, commissioner of works. Advertisement in "Tenders and For Sale Department" of this issue.

Stellarton, N. S.

Tenders for loan of $29,000 for water and sewerage are called until June 15th. J. W. Henderson, town clerk.

Steelton, Ont.

Tenders addressed to J. Robinson, town clerk, will be received until June 10th for construction of reinforced concrete outfall sewer, about 570 feet in length and 66 inches interior diameter. Chipman & Power, engineers, Toronto. Advertisement in "Tenders and For Sale Department" of this issue.

St. David's, Ont.

Negotiations are in progress between the St. David's Spring Water Company, Limited, and this municipality in regard to the installation of a waterworks system for the village. Secretary, Water Company, E. W. Murphy, Niagara Falls, Ont.

Thorold, Ont.

A by-law will shortly be prepared to cover the cost of proposed pavement and sewerage scheme.

Vancouver, B.C.

Tenders addressed to W. McQueen, city clerk, will be received until June 13th for supplies used in connection with the sewer construction.

AWARDED

Calgary, Alta.

Calling for the second tenders for the asphalt paving has resulted in a lower bid being put in by the Calgary Paving Company, who now offer to do the work at $2.32 a square yard. Their previous bid was for $2.45. The Crown Paving Company repeated the tender which they put in some time ago for $2.27. It was decided that the Calgary Paving Company should be given 25,000 square yards in the work to be given in the next by-law at the same figure as the lowest tendered on that work.

Edmonton, Alta.

The contract for construction in tunnel and supply of all materials for reinforced concrete block sewer was awarded to W. Manders, $179,816. A. J. Latornell, city engineer; contractor's engineer, R. Gregory, Edmonton.

Lethbridge, Alta.

The Canada Iron Corporation has been awarded the contract for five hundred tons of c. i. pipe for this city, about two miles. It is expected that the total amount will be put down this season.

Melville, Sask.

The successful tenderers for supply of equipment for waterworks and electric light were received: Kilmer Pullen & Burnham, Toronto, generators, switchboards, exciters, pumps, motors, and compressors installed complete, $7,438; Nortern Electric & Mfg. Co., Ltd., Winnipeg, street lighting system, $832; Northern Electric & Mfg. Co., Ltd., Winnipeg, poles and line material, $2,947; Wm. Bros & Sons, Minneapolis, two compression tanks, $2,018; Stanley Brock & Co., Toronto, cast iron mains, $37 per cwt.; Stanley Brock & Co., Toronto, special castings, $60.80 per cwt.

The following were the successful contractors: McAvity & Son, St. John, 4-in. hydrants, $36; 6-in. hydrants, $46; 8-in. gate valves, $17.50; 6 in. gate valves, $9.75; 4-in. gate valves, $6.50. Jas. Robertson Co., Winnipeg, pig lead, $4.55 per cwt.. oakum, $3.20 per cwt.

Moose Jaw, Sask.

The contract for extension of storm sewer was awarded to Walter Manden, Edmonton, Alta, $11,000. Othere tendered as follows: H. G. McVean, Regina, Sask., $12,950; W. E. Ransome, Moose Jaw, $8,850; Navin Brothers, Moose Jaw, $11,913; P. Kilkinny, Ltd., Moose Jaw, $11,148.

The contract for concrete sidewalks, curb and gutter, was awarded to Moose Jaw Construction Co., Ltd., $55,430. Others tendered as follows: W. E. Ransome, Moose Jaw, $56,018.35; Nairn Brothers, Moose Jaw, $61,492.69; Occidental Construction Company, $65,441.04; Moose Jaw Paving Company, Moose Jaw, $30,393.99 (part of work only); Western Pavers, Ltd., Winnipeg, $39,628.63 (part of work only). W. F. Heal, city clerk.

Montreal, Que.

The tenders for laying of permanent sidewalks are as follows: George Janin, chief engineer; Bithulitic Company, $26,500; Quinlan Asphalt Company, $14,000; Henault & Hefferman, $3,960; J. Chartier, $4,000; Hofeler Cement Company, $10,000; Hassam Paving Company, $40,042; Sicily Asphalt Paving Company, $31,000. The sidewalks are to be constructed in either asphalt or cement. Report about June 12.

Ottawa, Ont.

Contracts for pavements to be laid down this season were awarded by the board of control recently, as follows: Somerset street from Bronson to Division street, to the Union Construction Company, $24,258.90. The other tendeds were: The Barber Asphalt Company, $26,000; The Ottawa Construction Company, $24,870.

King Edward ave., from Laurier avenue to Somerset street., to the Ottawa Construction Company, for $10,897. The other tenders were: The Barber Asphalt Company, $12,180, and the Union Construction Company, $11,465.60.

Okotoks, Alta.

Work—½ mile of cement walk. Contract for ½ cement walk awarded to Curliss & Mattaini, 1102 Centre street, Calgary. Price, 17½ cents per sq. ft. Other tenderers: James Metcalfe, Okotoks, 18 cents; Crown Paving Construction C., Calgary, 19 cents; Forest City Paving Co., Calgary, 17¼ cents for walks, 25½ cents for crossings. D. J. Downey, clerk.

Penticton, B.C.

Contracts for waterworks material (bids opened May 1) have been awarded as follows: 69,800 lin. ft. 4, 6, 8 and 10 inch c. i. pipe at $46.05 to $47.35 per ton f.o.b. via Pacific and Vancouver, or $53.77 to $55.05 via Atlantic & C. P. R.; to Crane Co. for 10,000 ft. 12-in. pipe steel, lap welded, at $1.1969, and 400 feet 14-in. 14-in. at $1.6801, and gates for $3,719; to Simson, Blakwell & Co., of Vancouver, for hydrants, $2,668; to Canadian Fairbanks Co. for galvanized pipe, $1,248, and meters, $2,418, and to Drummond, McCall & Co., Montreal, Que., for steel pipe, $2,850. F. H. Latimer, Consulting Engineer, Penticton, B.C.

Quebec, Que.

The cost of paving according to different tenders received was as follows: granite paving, I. Blodeau & Sicily Asphalt Co., $90,000; scoria blocks, Madden & Barbeau, $107,000; Sicily Asphalt Co., $158,000, and Falardeau & Co., $142,000, not including scoria blocks between the rails. The tender of Madden & Barbeau for scoria blocks was accepted, that for asphalt rererred for report.

St. Lambert, Que.

The contract for supply of concrete pipes was awarded to Messrs. Francis & Co., that for vitrified pipes to Messrs. F Hyde & Co.

The council have awarded the following contracts for municipal improvements and machinery: quantity of sewer pipes to Hyde & Webster, $11,090; concrete pipe, F. Hawkins, (Aberdene) Granite and Marble Works, $8,460; ten ton steam roller, The Monarch R. R. Co., $2,600; crusher, screen and elevator, Canada Ford Co., $1,139; portable engine and boiler, Williams & Wilson, $790; surface for sidewalks, gutters and curbs, The Canadian Hassam Paving Co., at $1.31 per lineal foot. The work will average about six feet in width

St. John, N.B.

Tenders were awarded as follows: Paving blocks, Hilyard Bros., 1,500 yards at 55 cents per square yard; asphalt, Robert Reford Co., Ltd., $23.50 per ton; coal tar, Carritte Paterson Co., $3.40 per barrel; hardwood for use in making steam, George Dick, $7.39; Bay Shore spruce, C. E. Harding & Son, $14.50 per thousand; paving Johnston street, W. J. Thomas, 48 cents per square yard.

Waterloo, Ont.

The tender of the Warren Bitulithic Paving Co., Toronto, for the paving of King street, Waterloo, from William to Young streets, at $2.29 per square yard, was accepted. The cost of the pavement will be about $50,000. Work will be commenced at onse, and it is expected will be completed by September 1st.

Railroads, Bridges and Wharves

Burford Township, Ont.

Tenders for superstructure and substructure combined will be called about July 1st by the County of Brant for reinforced concrete bridge, one 75-ft. span, 16 ft. wide, foundation hard gravel over Whiteman's Creek. Engineer, W. H. Fairchild, Brantford; county clerk, A. E. Watts, K.C., Brantford.

Finch, Ont.

Tenders addressed to D. B. Cameron, clerk, township of Finch, will be received until June 9th for construction of the McLean drain in the 7th concession. Length of drainage work, 6,170; estimated quantity of earth excavation, 6,143 cu. yds. Plans, etc., at office of Magwood & Walker, civil engineers, Cornwall.

Meadow Brook, Westmoreland Co., N.B.

Tenders will be called about July 15 for bridge here, concrete abutments as foundation, superstructure, hard pine. Engineer, A. R. Wetmore, Fredericton.

Montreal, Que.

The Canadian Pacific Railway has under consideration plans for the construction of a five hundred foot bridge at Graham station, Ont.

Tenders addressed to David Seath, secretary, harbor commissioners, will be received until June 15th for supply of timber for 1912. David Seath, secretary.

Ottawa, Ont.

Tenders addressed to L. K. Jones, secretary, Department of Railways and Canals, will be received until August 1st for construction of a section of about 185 miles of the Hudson Bay railway from Pas Mission to Thicket Portage. Advertisement in "Tenders and For Sale Department" of this issue.

Tenders are to be called shortly for the extension of the Intercolonial Railway from Dartmouth, N.S., to Deans settlement; from New Glasgow to Sunny Brae, and also for an extension to Baddeck, C.B.

Osnabruck, Ont.

Tenders addressed to H. E. Hodgins, clerk, Osnabruck Centre, will be received until June 19th for construction of reinforced concrete bridge over the Hoople creek at lot 10, second concession. Engineer's estimate, 107 cu. yds. reinforced concrete, $1,500; 230 cu. yds. excavation, $140; 480 cu. yds. grading, $240; 250 lin. feet and wing fence, $50; expanse, $200, total, $2,130. Plans, etc., with above and with Magwood & Walker, engineers, Cornwall.

Port Arthur, Ont.

Tenders addressed to Mackenzie, Mann & Co., Toronto street, Toronto, will be received until July 1st for construction of the following sections: Port Arthur to a point on the boundary line between districts of Thunder Bay and Algoma; from end of section 1 to Kapuskasing Lake; Kapuskasing Lake to Sellwood junction. Tenders to include clearing, grubbing, grading, bridges, trestles, culverts, masonry, fencing, telegraph line, track laying, and blasing. Plans, etc., at office of above.

Quebec, Que.

It is announced that satisfactory financial arrangements have been made for the building of a new railway to run in an air line from Quebec to St. John, N.B., crossing the State of Main, by a syndicate known as the St. John and Quebec Railway Cobpany. Mr. Gould, president.

Toronto, Ont.

Tenders addressed to F. S. Spence, chairman board of control, will be received until June 20th for construction of a steel span crossing the tracks of the C. P. R. at Weston Road. Specifications, etc., at the Department of Railways, Bridges and Docks, engineer's office. Advertisement in "Tenders and For Sale Department" of this issue.

Public Buildings, Churches, Schools, etc.

Berlin, Ont.

The by-law to raise $15,000 toward the erection of proposed addition to the Berlin-Waterloo hospital was carried.

Belleville, Ont.

The Board of Education have approved of the plans of Ellis & Co., architects, Manning Chambers, Toronto, for two public schools, one 10-room, the other 12-room, brick and stone, costing respectively $35,000 and $50,000. Tenders after June 20th.

Brandon, Man.

Work will commence shortly on the projected addition, 4-storey brick wing to Brandon College. Principal, A. P. McDiarmid, D.D.

The site has been purchased for Winter Fair building for the Winter Fair Association, concrete and steel. No details have been worked out yet. W. A. Elliott, architect for previous work, will probably take charge.

Birchton, Qne.

Tenders were called until June 6th for erection of school for District No. 2, Low Forest, Eaton. A. F. Swan, secretary-treasurer.

Brantford, Ont.

Burke, Horwood & White, Toronto, have been recommended as architects for the new Y. M. C. A. building, $100,000.

Tenders will be called shortly for all trades with the exception of masonry for Roman Catholic church here, $10,000. Architect, R. Closhesy, 236 James street, Hamilton.

Tenders addressed to Leslie Hastings, trustee, will be received until June 17th for erection of Grand View school, $18,

000. Plans call for 2-storey 6-room, brick and stone, 81 x 74, slate roof. Architects, Taylor & Taylor, Brantford.

Chippewa, Ont.

On June 23rd a by-law will be submitted for approval, to provide $11,000 for the erection of a school house. W. A Myers, clerk.

Cannington, Ont.

New tenders are wanted for 2-storey school here, $8,000. Specifications call for brick, cement foundation, steam heating, shingle roof. G. M. Miller & Co., 59 Yonge street.

Cornwall, Ont.

Tenders addressed to L. K. Jones, secretary, Department of Railways and Canals, will be received until June 9th for erection of machine shop. Plans, etc., at offices of chief engineer, Ottawa, and of resident engineer, St. Lawrence Canals, Cornwall.

Calgary, Alta.

The congregation of Knox Church have accepted the plans for the new church and the board of managers were authorized to call for tenders. Building proper will cost over $150,000; organ, about $10,000; furniture and cost of manse to be erected later, not included. Mr. Justice Stuart and J. T. MacDonald, are interested.

Tenders will be called for construction of new municipal hospital. W. F. Heal, city clerk.

Nearly $25,000 has already been subscribed towards the $75,000 required by Grace Presbyterian congregation for their new church. Rev. A. Elser, pastor.

East Sherbrooke, Que.

Tenders are called until June 20th for erection of Protestant hospital here. Specifications call for 4-storey, stone and brick, stone foundation, hot water heating, fireproof, etc. C. E. White, architect.

Fergus, Ont.

Plans for a new Armory, 64 feet by 32 feet, to be built by the Dominion Government, have been received, the only condition attached being that the council provide a free site, which, no doubt, will be done.

Fort Erie, Ont.

Tenders are called until June 24th for 1-sty. hall (brick veneer) for St. Paul's Church, Fort Erie. Plans, etc., at Henry Emrick's, Bridgeburg, Ont. ....

Fort William, Ont.

Tenders will be called shortly for theatre, $75,000, solid brick, stone, tar and gravel roof, two tiers of galleries. Owner, J. C. Murray & Co.; architect, G. W. & G. L. Rapp, Chicago.

Gleichen, Alta.

Plans are being prepared for erection of Fire and City Hall, $7,000. Architect, J. D. W. Wilson, Dominion Block, Calgary.

Hamilton, Ont.

Tenders will be called shortly for new school building, brick and stone. Architects, Stewart & Witton, Hamilton.

Halifax, N.S.

New tenders will be called for Technical School laboratory. Lowest tender received, $21,000; estimated cost, $12,000. The Commissioner of Public Works anad Mines will call for tenders.

Tenders are called until June 15th for garbage disposal plant, $40,000 with capacity of 50 tons in 24 hours. City engineer, F. W. W. Doane.

Tenders to be called about June 20th for erection of Tower Road school. W. J. Busch, architect, 60 Bedford Row.

Lumsden, Sask.

On June 14th a by-law will be submitted to raise $7,000 by way of debentures, for the erection of a skating and curling rink. B. Morton, secretary-treasurer.

Lethbridge, Alta.

The armory to be erected here is estimated to cost about $30,000. Mr. Manwaring, secretary, board of trade.

London, Ont.

Tenders are called by County Clerk T. E. Robson, until June 9th for alterations to court house. City Architect, A. E. Nutter.

Lennoxville, Que.

Tenders are called until June 15th for erection of school building, $15,000. Specifications call for brick and stone, 2-storey. Architect, J. W. Gregorie, Lennoxville.

Medicine Hat, Alta.

Tenders addressed to E. J. Fewings, secretary-treasurer, general hospital are called until June 12th for erection of brick addition to nurses' home.

Montreal, Que.

The following tenders for the new smallpox hospital for the city of Montreal are under consideration by the con trollers: J. B. Pauze & Co., $41,000. Mantineau & Prenoveau, $33,900. Joseph Denis, $33,701. J. Gauthier, $47,500. O. Rondeau, $38,980. N. Allard & Fils, $32,500. Messrs. Marchand & Haskell, architects.

The Sparrow Amusement Company has purchased a building site on St. Catharine street, east of the present Theatre Francis, on which, it is stated, a theatre capable of seating 2,100 people, will be erected.

Ottawa, Ont.

Tenders will be called shortly for erection of New Westminster Presbyterian Church, 60 x 99, stone, steam heat, electric light, asbestos shingle roofing, interior finish ash and oak, metal ceiling, steel beams. Architect, A. Keefer, Free Press building, Ottawa.

Renfrew, Ont.

Plans are being passed on by Minister of Education for gymnasium addition to high school, 2-storey, 35 x 75, concrete foundation, solid brick walls. Tenders will be called later. J. D. McNichol, architect, Renfrew.

Red Deer, Alta.

The by-law to raise $10,500 to purchase the Exhibitions Association property was carried.

Regina, Sask.

Tenders are called until June 12th for erection of parish hall. Architects, Storey & Van Egmond.

Tenders addressed to J. H. Cunningham, secretary, public school board, will be received until June 7th for erection of addition to Albert school. Architects, Storey & Van Egmond.

Saskatoon, Sask.

The by-law for extension of the municipal hospital was defeated.

Work will commence on the new St. Paul's hospital for the Order of Grey Nuns, headquarters, Montreal. Estimated expenditure, $100,000.

Swift Current, Sask.

This municipality is contemplating the erection of a hospital. Secretary, A. J. Macdonald. Further information later.

Strathcona, Alta.

The trustees of St. Anthony's have taken an option of block 12 between Fifth and University avenues for a building site for a new school.

South Vancouver, B.C.

The Provincial government will be asked to guarantee bonds to the extent of $1,000,000 as provision for hospital.

Sault Ste. Marie, Ont.

The erection of a theatre is under consideration by the Star Amusement Co. The building will probably be 2-storey, brick, 44 ft. x 105 ft. Tenders will probably be called for Sept. 1st.

Plans are called for erection of general hospital. Proposed building, 3-storey solid brick, hot water heating, electric lighting, stone foundation. For further information address Algoma Benevolent Society, this city. Estimated cost, $20.000.

Trail, B.C.

The school by-law to raise $25,000 was carried by a large majority.

Thamesville, Ont.

On June 12th a by-law to raise $3,500 for town hall purposes will be voted on. W. J. Cryderman, clerk.

Toronto, Ont.

Plans are being prepared by Symons & Rae, architects, 15 Toronto street, for Parish House, $15,000, for St. John's Church, West Toronto.

Tenders addressed to J. P. Hynes, ar chitect, Bank of Commerce Building, for erection of a building on St. Patrick street for the Young Women's Christian Association.

Tenders are called until June 12th for the several trades required in enlargebent of Earl Grey Frankland schools, also midsummer repairs (all trades). Advertisement in "Tenders and For Sale Department" of this issue.

Tenders addressed to R. C. Desrochers, secretary, department of public works, Ottawa, will be received until June 14th for supply of fittings for Central post office. Plans, etc., on application to Mr. T. A. Hastings, clerk of works, postal station "F" Toronto; and at the above department.

Verdun, Que.

The Presbyterians here will tear down their church, corner of Ross and Church streets, and erect a larger structure in its place.

Virden, Man.

The $25,000 by-law for opera house and telephone exchange will be voted upon this month. W. A. Elliott, architect.

Victoria, B. C.

The plans prepared by Architect C. E. Watkins, for the new high school to be erected in the Spring Ridge district have been accepted by the school board. Intructions were given to call for tenders or construction as soon as possible.

Vancouver, B. C.
Tenders are called until June 5th for erection of 2-storey brick and stone school near East Collingwood school. J. H. Bowman, architect.

Welland, Ont.
Tenders addressed to J. McCaw, secretary public school board, will be received until June 20th for erection of 8-room school here. Plans, etc., at office of A. E. Nicholson, architect, 46 Queen street, St. Catharines, and at the store of the above.

Waterville, Que.
Tenders are called until June 15th for erection of Episcopal church hall, $3,500. Specifications call for 1-storey, shingle roof, hot-air heating.

Winnipeg, Man.
The members of St. John's Methodist Church have decided to take steps to enlarge the present edifice, or erect a new one.

AWARDED

Calgary, Alta.
The general contract for erection of Golf & Country Club house has been awarded to Blacksire, Lyttle & Jones, $15,000. Architect, Lawson & Fordyce, Calgary.

The new garbage destructor will be of the Heenan & Froude type, equipped by Laurie & Lamb, Montreal, who undertake to have it in operation by Nov. 1st. Capacity of plant 75 tons per day.

Contracts have been awarded by the school board for the erection of five 2-room school houses as follows: To J. Macphail, one in West Mount Pleasant and one in La Grange, at 4,350 each. To H. Lougheed, one in Erlton at $4,200. To H. Church, one in Glengarry and one on a site to be selected later, $4,350.

Fort William, Ont.
The contract for erection of Roman Catholic Separate school has been awarded to C. Mathieu, $12,000. No sub-contracts let yet.

The contract for erection of Central school annex was awarded to R. McLeod, $29,680. Instructions were given to call for tenders on painting, glazing, heating and plumbing.

Lake Megantic, Que.
The contract for the building of the new Presbyterian church has been awarded to Mr. Jos. Coulet of Megantic, for $4,450 for the finished structure.

Montreal, Que.
Messrs. Martineau & Prenoveau have the contract for erection of the new normal school which the ladies of the congregation are erecting on Sherbrooke street west. Architects, Marchand & Haskell.

Nutana, Sask.
The Brandon Construction company has been awarded the contract for a school, $55,000.

Orillia, Ont.
The general contract for erection of Y. M. C. A. building was awarded to F. Webb, Orillia. J. H. Robertson, architect. Contracts for plumbing and heating not awarded.

Toronto, Ont.
The contractors for erection of Deer Park Presbyterian Church were as follows: Masonry, Leslie & Killer, Waterloo; carpentry, Geo. Nicholson, 61 Clinton street; plastering, Thos. Fitzgerald, 47 Sorauren ave.; heating and plumbing, W. J. McGuire, Ltd., 86 King street west; slate roof, G. Duthis & Sons, 30 Widmer street; iron work, Dominion Bridge Company, 4 Richmond street east; terra cotta work, Chillas & Black, 106 Bay street, agents for Doulton Co.; architects, Sharp & Brown, 18 Wellington street east.

The following tenders were accepted by the board of education:—Fern avenue school—Masonry, J. W. Hewitt, $12,041; carpenter kork, Frank Armstrong, $7,039; plastering, George White $12,041; carpenter work, Frank Arm-structural steel, W. H. Salter, $1,128; roofing and tinsmithing, Forbes Roofing Co., $854; fire proof floors, H. Lucas & Son, $1,354. Ogden street school—Masonry, G. T. Gayton, $1,100; carpenter work, M. Hutchinson, $2,386; plastering, Geo. White, $588; painting, J. Casey $210; heating, etc., Fred. Armstrong Co. $299; structural steel, Reed & Brown, $1,755; roofing and tinsmithing, Geo. Duthie & Son, $330. Roden school—Masonry, R. Chalkley & Son, $13,200; carpenter work, Frank Armstrong, $10,185; plastering, Geo. White, $1,296; painting, Jas. Casey, $799; structural steel, W. H. Salten, $1,250; roofing and tinsmithing, Geo. Duthie & Son, $1,160; terra cotta work, R. Chalkley & Son, $1845; cupboard doors for armouries, Simpson Planing Mill, $75; liquid slating, W. Walker, 35c a yard.

Winnipeg, Man.
The contract for heating and ventilating the Strathcona school and new addition was let to Thomson & Horner, $16,300. This includes air washer and Vacuum cleaner. J. B. Mitchell, architect, commissioner, school buildings.

The contract for 1,300 feet of iron fence around King Edward school was let to Munro Steel and Wire Works for 71½ cents per lin. ft.

Residences

Brantford, Ont.
Tenders received after June 5th until June 15th for erection of residence for W. B. Preston. Estimated cost, $10,000. Specifications call for tapestry brick, brick foundation, 3-storey, slate roof, hot water heating, electrical work, hardwood interior finish.

Tenders will be received shortly for priest's residence, $10,000. Plans call for pressed brick, concrete foundation, with stone facing, 40 ft. x 40 ft., hot water heating, electricity, slate roof, hardwood and Georgia pine finish, 2½ storeys. Rev. Dean Brady is interested. Architect, R. Closhesy, 236 James street south, Hamilton.

Brockville, Ont.
Tenders addressed to B. Dillon, architect, will be received until June 10th for the various trades required in connection with improvements to residence of A. Gilmour.

Calgary, Alta.
Tenders called after June 2nd for erection of residence for J. E. B. May. Architect, Burroughs & Richards, 11 Crown Block. Estimated cost, $4,000

Drummond, Que.
Tenders addressed to Thos. Tremblay, city engineer, were received until June 3rd for erection of double tenement house here, about 3¼ miles from Sherbrooke.

Galt, Ont.
Tenders called after June 10th and received until June 20th for store, $4,000, for J. A. McDougall, Galt. Foundation constructed last fall. Specifications, brick veneer, hot water heating, interior finish ash, electric light, 2-storey, 36 x 48.

Medicine Hat, Alta.
Architect Williams is preparing plans for the Nurses' Home for the general hospital. Estimated cost, $7,000. Plans for residence for F. M. Ginther on the corner of Fifth avenue and Balmoral street are also being prepared. Estimated cost, $3,500.

Orillia, Ont.
Tenders will be called shortly for 2-storey residence, $5,000, for S. S. Mullett. J. H. Robertson, architect.

Toronto, Ont.
Tenders called after June 8th for erection of apartment house, $6,000, for W. H. Mitchell, Toronto. Plans call for 3-storey brick, 40 x 43. J. Hunt, Stanford, Yonge Street Arcade, Toronto, architects.

Thornbury, Ont.
Tenders will be called for 8-room, solid brick residence, $3,000 for E. C. M. Pedwell. Architect, John Wilson, Collingwood.

Vancouver, B.C.
Plans have been filed for extension of apartment house at Thurlow and Haro streets, $125,000, by Mr. P. Agren.

Calgary, Alta.
Tenders called after June 2nd for erection of residence, $4,000, owner, J. E. B. May; architect, Burroughs & Richards, Crown Block.

Winnipeg, Man.
Tenders are called until June 8th for erection of residence for Mr. Geo. Cram by E. D. Tuttle, architect.

Tenders addressed to E. D. Tuttle, architect, 701 McArthur building, will be received until June 9th for erection of two residences.

AWARDED

Hamilton, Ont.
The general contract for residence for Bank of Montreal has been let to R. Tope, 191 Robinson street, brick and stone construction. Architects, Stewart & Witton.

Business Buildings and Industrial Plants

Belleville, Ont.
The by-law to grant aid to Messrs. Marsh & Henthorn towards erection of $40,000 building will be submitted June 26th; also that for Allard & Platinum Co., who agree to expend not less than $10,000 on site.

Brockville, Ont.
Plans are prepared for plant for National Manufacturing Co., $15,000, calling for brick, 400 x 50, [illegible]

heating, [illegible] [illegible]. Nothing further will be done for some time. A [illegible] [illegible], architect, Brockville.

Tenders will be called shortly for [illegible] for Metropolitan Bank, Toronto. Plans call for 1-storey masonry and wood construction, hot water heating, electric lighting, interior oak and brick materials—cut stone, metallic lath, ornamental iron, vaults, plastic relief, plate glass.

Brantford, Ont.

The Massey Harris Co., Ltd., will build a large extension to their plant at Brantford.

Tenders are called until June 15th for erection of bank and office building, $30,000 for Royal Loan & Savings Co. Specifications call for 3-storey, 40 x 63, fireproof, reinforced concrete, marble front, brick foundation, electrical work, terra cotta brick, metallic lath, pipe covering, plate glass, sheet metal work, vaults, hardwood and marble.

Plans were presented for approval covering the 10-storey block which is to be erected for Ald. Rogers at corner of Granville and Pender streets. Estimated cost, $500,000.

Chatham, Ont.

Tenders were called for erection of brick and concrete packing house at the junction of the G. T. R. and P. M. railway. Plans, etc., at office of O'Keefe & Drew.

Calgary, Alta.

Alderman Ross is planning a 2-storey and basement addition to his present block in Hillhurst. Estimated cost, $30-000.

Collingwood, Ont.

Tenders will be called shortly for factory for E. A. Ditson, Collingwood, of solid brick. Architect, John Wilson.

Fort Frances, Ont.

The transfer of thirty acres to the C. N. R. for their tourist hotel has been ratified by council. Stipulated expenditure, $150,000 on hotel, $50,000 on grounds.

Guelph, Ont.

The by-law to grant civic privileges to the Independent Tire Co. was carried in return for which a factory will be erected to cost $50,000.

Hamilton, Ont.

Tenders will be called at once for brick and stone hotel. Owner, W. Willison, John and Jackson streets. Architect Munro & Mead, Main street, Hamilton.

Tenders will be called shortly for erection of factory for Zimmerman Mfg. Co., 2½ storeys, stone and brick, 150 x 60. Owners in charge of work. Estimated cost, $25,000.

Tenders will be called at once for business building, $40,000, for Standard Sanitary Co., Ltd. Architect, Stewart & Witton.

Hespeler, Ont.

The A. B. Jardine Company will erect a new moulding shop at Hespeler, Ont.

Kingsville, Ont.

The exchange hotel here was destroyed by fire on the 30th ult. Owner, W. Wilson. Estimated loss, $15,000.

Lethbridge, Alta.

Tenders are called until June 21 for erection of grain elevator 40 miles south of this city. Elevating machinery, cleaners, metal siding and lumber required. Architects, H. M. & W. A. whiddington, Lethbridge.

London, Ont.

The cold storage plant here was damaged by fire to the extent of about $20,000 on the 30th ult.

A building permit for $60,000 was issued recently for C. P. R. improvements in East London. A roundhouse is to be erected. New repair shops will be built in the fall.

Mulgrave, N. S.

Tenders addressed to A. W. Campbell, chairman government railways managingboard, will be received until June 10 for construction of a brick and stone passenger station here. Plans, etc., at office of the above department, at the station master's office here and at the chief engineer's office, Moncton.

Medicine Hat, Alta.

Tenders were called until June 3rd for erection of brick and stone building for Medicine Hat Printing and Publishing Co., Ltd. W. T. Williams, architect.

The Union Bank has purchased the corner of Fourth avenue and Toronto street. It is understood that a 3-storey building will be erected here. Local manager, Mr. Hopper.

Medicine Hat, Alta.

By-laws were carried granting a site and 250,000 cubic feet of gas per day to the glass works backed by D. C. Cameron, of Winnipeg, which will employ 150 hands. The same concessions go to the Alberta Foundry and Machine company, employing 100 hands. This month a vote will be taken on granting a site to the Preston Planing Mills, the Gordon Nail Works and the Medicine Hat Milling company. The Union bank has purchased a site on Toronto street and will immediately proceed to erect a 3-storey building.

Montreal, Que.

Plans for the Carlton Hotel, corner of Sherbrooke and Drummond streets, were approved by Mr. A. Chausse, the building inspector, subject to certain alterations, which will make for little thicker exterior walls. The cost of the hotel building will be $1,250,000, exclusive of all furniture and fittings. It will be ten storeys high, containing 350 rooms, three staircases, four elevators, and two fire escapes. The building will be fireproof throughout. The architects are Messrs. Warren and Wetmore, New York.

Orillia, Ont.

Plans are being prepared by J. H. Robertson, Orillia, for factory for National Hardware Co., $15,000. Specifications call for brick (slow burning) cement foundation, asbestos roofing, 2-storey, 45 x 100 x 34, steam heating, electric lighting, iron columns.

Plans are being prepared by J. H. Robertson, Orillia, for brick and stone store for Cabana & Watson. Specifications call for steam heating, electric lighting, 4-storey. Work will commence in the fall.

Port Arthur, Ont.

Messrs. John Stirrett & Sons purpose erecting planing mills, sash and door factory, in Midway. Estimated cost, $85,000.

Regina, Sask.

The Farmers' Steel and Wire Company, Limited, will erect a 6-storey warehouse, 110 x 112, the first two storeys being built this year. Architect, W. W. Hilton.

Plans are being prepared for the erection of a five or six storey building for the Leader Publishing Company, on Hamilton street. Sharon and Darrach are said to be preparing the plans for the building. Estimated cost, $200,000

Sherbrooke, Que.

It is understood that Bank of Montreal will erect a branch on the property recently purchased here by them. Local manager, Mr. R. A. Aiken.

Smith's Falls, Ont.

Tenders addressed to H. A. Davidson, Smith's Falls, will be received until June 15th for erection of brick block on corner of Beckwith and Russell streets. Plans, etc., at office of architect, Smith Falls, and at store of H. A. Davidson.

Southampton, Ont.

Tenders are called at once by Bell Furniture Co., Ltd., for installation of vaccum heating system and sprinkler system for fire protection in new addition to chair factory.

Toronto, Ont.

Tenders were called until June 5th for erection of stores and apartments, $20,000, cor Spadina and St. Patrick. Architect, H. Simpson, 82 King street east, Toronto.

Woodstock, Ont.

Tenders were called for erection of 1-storey bonding factory for Crown Lumber Co., Ltd., Woodstock. Interior finsh will be of cement. Specifications call for cement work, asbestos pipe covering, telephone system, sprinkler system, electric bells, plate glass. Architect and contractor, F. G. Bachman.

Winnipeg, Man.

The Gilmour Soap Company, Montreal, are reported to be contemplating the erection of a branch factory. G. M. Bilmour, manager.

The Canadian Swift Packing Company have secured a building site with trackage at the corner of Adelaide and William avenue, and it is understood that they intend to build this summer.

It is announced that the new Winnipeg Electric Railway office building, on the corner of Notre Dame avenue and Albert street, will most probably be a ten-storey building. Preliminary plans have been prepared which will be laid before the board at their next meeting.

Vernon, B. C.

Tenders were called until May 29th for erection of 2-storey and basement general store building for the Hudson Bay Co. Plans, etc., at Davis Chambers, 615 Hastings street west, Vancouver. Dalton & Eveleigh, architects, Vancouver.

Vancouver, B. C.

A factory building is contemplated by the Brantford Motor Truck Co., Ltd., building to commence at once. R. A. Bailey and R. P. Cumback, owners.

A building permit has been issued to Boyd & McWhinnie for 6-storey building, corner of Cordova street and Columbia avenue, $60,000.

AWARDED

Hamilton, Ont.

The general contract for erection of factory building, $15,000; office building, $40,000, for Oliver Plow Company, has been awarded to Prack & Perrine, Gilkinson street, Hamilton. Contractor for iron work, Hamilton Bridge Company.

Regina, Sask.

James McDiarmid & Co., Winnipeg, are stated to have been awarded the contract for erection of C. P. R. and C.N.R. new Union Station.

Sherbrooke, Que.

The general contract for erection of store for D. W. Stinson, Sherbrooke, has been awarded to J. V. Laplante. Specifications call for stone and brick, 3-storey building to be completed Sept. 1st.

Swift Current, Sask.

The general contract for erection of hotel has been awarded to Martin & Murphy, Regina. Estimated cost, $60,000. Cement contract, A. Gilsbrow, Swift Current; plumbing contract, J. Simes. Excavations for foundations nearly completed.

Winnipeg, Man.

Carter-Halls-Aldinger Co., Ltd., have been awarded the contract by the C. P. R., for the erection of an addition to the tender and wheel shop in the company's Weston shops, 220 feet by 54 feet 8 inches.

A contract, amounting to $90,000, it is stated, has been awarded to Peter Lyall and Sons, for the erection of the train shed at the new Union depot.

Vancouver, B. C.

The contract for the construction of the examining warehouse to be built by the Dominion Government has been awarded to A. McDermott & Co. of Winnipeg. The estimated cost of the building, which is to be of stone structure and four storeys in heigth, is given as $350,000.

Power Plants, Electricity and Telephones

Berlin, Ont.

The by-law to raise $20,000 for alterations, etc., to gas and electric light plants was defeated, also that for the laying of new tracks on King street.

Brantford, Ont.

Tenders are called by Engineer W. P. Kellett, Brantford, until August 1st for construction and equipment for the Brantford & Port Dover Railway. Length, 30¼ miles; steel towers (6,600 volt, single phase); five large bridges. Surveys made.

Canora, Sask.

By-laws aggregating $100,000, for waterworks and electric light, have passed the council, and will shortly be submitted for approval

Comox, B.C.

Tenders addressed to W. L. Coulson, general manager, will be received until June 26th for supply of Hydro-electric equipment for the Canadian Collieries (Dunsmuir) Ltd., Puntledge River. Contract includes complete hydraulic and electric equipment, furnishing and installation of two direct connected units, each unit developing 3,750 k.v.a. at switchboard. Plans at office of company, Pemberton Block, Victoria.

Tenders also received until June 26th for construction in connection with development of power, including clearing, construction of dams, flume, pipe line and power house.

Hamilton, Ont.

A by-law will shortly be submitted to provide for $500,000, for power and light distribution plant.

Hull, Que.

The Hull Electric Company intend to erect car sheds, repair shops and offices for their railway at a cost of $25,000, on their property near the Hull Junction (Ottawa and Gatineau Valley station) in the Little Farm. Plans for the buildings, which will be constructed of brick, with all modern improvements, will be presented to council by Mr. Chene, city engineer, who has gone carefully over the plans, and will present them to the city council on Monday next

Middleton, N.S.

A by-law is under consideration to provide $15,000 for the purchase and installation of an electric light plant.

Moose Jaw, Sask.

The by-law to raise $7,500 for ornamental lights was carried; also that for electric light system, $35,000.

Niagara Falls, Ont.

Tenders addressed to J. Robinson & Sons, Niagara Falls, will be received until August 1st for the following electrical equipment: lathe, drill press, shaper, electric rectifier.

Prince Albert, Sask.

Bids will be received until June 26 by C. O. Davidson, secretary-treasurer, for hydraulic power and electrical power equipment at La Colle Falls Power Station. C. H. & P. H. Mitchell, Engineers, Traders' Bank Building, Toronto, Ont.

Peterborough, Ont.

The Otonabee Power Co., it is stated, will spend $200,000 on increasing its equipment to provide an output of 4,000 h.p. About 50 acres of land have been purchased for extensions. Estimated expenditure, $200,000. Messrs. Ross & Holgate prepared plans in 1907.

Swift Current, Sask.

In connection with power plant there will be an opening for sale of electric meters, no house connections or secondary wiring done yet. Engineer, J. Darlington Whitmore, Regina.

AWARDED

Moose Jaw, Sask.

Contracts for equipment for the power house were awarded as follows: To the Babcox-Wilcox Co., boilers at $5,975, stoker at $2,000, piping at $375, tee bars and supporting flue, $200. The City Weigh Master reported receipts for the week of May 30 as follows: Water, $7.67; scales, $6.50; dog pound, $8.00.

Regina, Sask.

Some 200 iron poles will be purchased for the street railway work, from Dawson & Company, Winnipeg.

Saskatoon, Sask.

The Dominion Bridge Co., Montreal, were the successful tenderers for the steel framework for the new power house. A. J. Randall, Saskatoon, will put together some 170 tons of frame work at $16 a ton.

Winnipeg, Man.

The tender of Dunn Bros. for the street light known as the "mast arm," meaning that the lights are at the end of square arms on a 22-ft. standard, was accepted. Amount of tender, $15,612 for 150 delivered in the city brackets, half way up the pole to carry the signal lamps which will flash red lights for the fire department and green lights for the police patrol system will cost $7.

Miscellaneous

Winnipeg, Man.

The following building permits were issued recently: J. W. Phillipson, dwelling, Telfer street, $2,000; Stanbridge Realty Company, dwelling, Morley avenue, $2,500; J. Robinson, dwelling, Wellington Crescent, $20,000; H. Rodgers, dwelling Victor street, $2,400; Hicks Construction Co., 9 dwellings, McMillan ave., $27,000; Machray Parker, dwelling, Assiniboine ave., $10,000; A. Rheume, tenement, Alexander ave., $2,600; Presbyterian church, Burrows ave., $25,000; A. Macam, dwelling, Dorchester avenue, $4,000; Winnipeg Supply Co., coal bins, Nora street, $3,000; G. A. Muttlebury, two stores, Portage avenue, $5,600; J. M. Suttie, dwelling, Fisher street, $5,000; D. Kirkerod, two dwellings, Lenore street, $7,000; P. Rungle, tenement house, Boyd avenue, $2,900; C. L. Taylor, dwelling, Wellington Crescent, $30,000; J. G. Walker, dwelling Wardlaw avenue, $6,000; C. Henneson, dwelling, Toronto street, $2,500; T. P. Carver & Son, dwelling, Polson avenue, $2,500; P. Tropik, two dwellings, Aberdeen avenue, $1,600; Andrews and Son, dwelling, Yale avenue, $4,500; Andrews & Son, dwelling Harvard avenue, $8,000; W. D. Brock, dwelling, Assiniboine avenue, $7,500; F. W. Stoneham, dwelling, Lipton street, $3,000; Lawrence Brothers, three dwellings, Richmond street, $4,800; J. A. Patterson, dwelling, Athol avenue, $2,800; MacKissock and Thomas, Limited, two dwellings on Dominion street, $10,000; G. R. Crowe, dwelling on Assiniboine avenue, $33,000; H. J. Box, dwelling, Crescent Road, $10,000; J. A. Matthews, three dwellings, Rosedale avenue, $7,500; F. Walker, dwelling, Dorchester avenue, $9,000; H. Holderson, dwelling, Inkster avenue, $3,000; L. D. Fitzgerald, dwelling, Victor street, $3,360; J. F. Scribner, dwelling, Agnes street, $3,800; J. A. Munro, store and apartment block, Pembina street, $20,000; H. J. Box, dwelling, Crescent road, $10,000; J. A. Matthews, three dwellings, Rosedale avenue, $7,500; F. Walker, dwelling Dorchester avenue, $9,000; H. Holderson, dwelling, Inkster avenue, $3,000; L. D. Fitzgerald, dwelling, Victor street, $3,300; J. F. Scribner, dwelling, Agnes street, $2,800; T. E. Lewiston, stores and apartments, Selkirk avenue, $20,000; E. Bray, brick dwelling, Bannerman avenue, $3,000; A. C. Galbraith, 4 dwellings, Wolesley avenue, $10,000; A. C. Galbraith, nine dwellings, Bannerman Place, [illegible]; A. [illegible] dwelling, Oakwood [illegible]

Tenders and For Sale Department

Contractors' Material
IN CANADA

[illegible] Motors, 3, 5 and 7½ h.p.
C. W. Co. Auto Starter 5 to 15 h.p. and 15 to [illegible]
[illegible] 10-ton Locomotive Crane, overhauled.
[illegible] Complete Cableways.
Thirty-eight Western, One-way, Side Dump Cars.

We [illegible] of material in Canada.

If in want of anything, write us. What have you to sell?

THE MALES COMPANY,
No. 82 Perin Building.
Cincinnati, Ohio.

Tenders
For the Construction of a Reinforced Concrete Subway

Sealed and endorsed tenders addressed to the Chairman of the Utilities Committee will be received at the office of the City Clerk up to 5 o'clock p.m., **June 30th, 1911**, for the construction and supply of all materials in connection therewith.

Plans, specifications and forms of tender may be obtained at the office of the City Engineer, Fort William; the office of the Contract Record, 220 King street west, Toronto; Canadian Engineer, 62 Church street, Toronto, or Builders' Exchange, Winnipeg.

The lowest or any tender not necessarily accepted.

JOHN WILSON,
City Engineer.

City Engineer's Office,
May 16th, 1911. 22-24

Tenders
For
Waterworks Supplies, Etc

TAVISTOCK, ONTARIO,

Sealed tenders addressed to the town clerk will be received up to 12 o'clock noon on **Wednesday, June 14, 1911**, for waterworks supplies and labor as follows:—

Approximately 2,250 feet of 8-inch, 2,550 feet of 6-inch and 2,100 feet of 4-inch cast iron water pipe, about 7 tons of special castings, about 16 hydrants, valves, etc. Also excavating for, laying and covering above pipe. One steel elevated tank.

Conditions and forms of tender, plans and specifications may be seen at the office of either of the undersigned.

Lowest or any tender not necessarily accepted.

F. W. FARNCOMB,
Consulting Engineer.
64 Bank of Toronto Chambers, London, Ont.
J. G. FIELD, Village Clerk.
Tavistock, Ont. 21-23

Bucket Crane

FOR SALE—One full circle, self-propelling, modern 10 to 15-ton capacity. Browning size No. 1 Locomotive Crane, standard gauge, 4-wheel truck, 38 ft. steel boom, 8 x 10 engines, equipped to handle Clam or Orange Peel. Will furnish with or without bucket. Attractive price, fine condition, quick delivery. Inspection here.

WILLIS SHAW MACHINERY CO.
39 So. LaSalle Street, Chicago.

CITY OF SASKATOON

Sub-Structure for 19th Street Subway

Sealed tenders, addressed to the City Commissioners, Saskatoon, and endorsed "19th Street Subway," will be received up to twelve o'clock noon on **Thursday, June 15th, 1911**, for the above.

All informtaion may be obtained from M. H. McLeod, Chief Engineer, Canadian Northern Railway, Winnipeg, or from George T. Clark, City Engineer, Saskatoon.

The lowest or any tender not necessarily accepted.

JAMES CLINKSKILL,
W. B. NEIL, City Commissioners.
E. M. SNELL,
Saskatoon, Sask. May 23, 1911. 22-23

VILLAGE OF BIGGAR SASKATCHEWAN

Sealed tenders marked Tender No. 1, Tender No. 2, Tender No. 3, Tender No. 4, Tender No. 5, Tender No. 6, Tender No. 7, will be received by the Sec.-Treas. of the Village of Biggar, Sask., up till noon, **Tuesday, June 13th, 1911**, for the following:

Tender No. 1.—Trenching, laying and back filling for cast iron water mains, hydrants, valves, etc.

Tender No. 2.—For supplying cast iron water mains and specials.

Tender No. 3.—For supplying hydrants, valves and valve boxes.

Tender No. 4.—For supplying and installing all pump machinery.

Tender No. 5.—For supplying and installing a compressed air storage tank.

Tender No. 6.—For erection of a power house.

Tender No. 7.—For the construction of a concrete reservoir.

An accepted cheque equal to five per cent. of the amount of tender must accompany each tender.

Plans and specifications can be seen at the offices of the Secretary-Treasurer of the Village of Biggar, Sask., or the Engineer, Yorkton, Sask., or copies can be had from the Engineer on receipt of a marked cheque for $10, which cheque will be returned on return of the plans and specifications.

F. McARTHUR,
Consulting Engineer,
22-23 Yorkton, Sask.

City of Fort William, Ont.

SALE OF MUNICIPAL PUMPING & ELECTRICAL GENERATING PLANT

Tenders in bulk or in part will be received by the city clerk, addressed to the Chairman of Utilities Committee, on or before the 1st day of July, 1911, for the sale of the following equipment:

2 Duplex Compound Northy Pumps, High pressure cylinder, 14 in. diam; low pressure cylinder, 20 in. diam.; pump cylinder, 11 in. diam; stroke cylinder, 15 in. diam. Capacity of each, 600 gallons per minute.

1 tandem compound engine—cylinders 21 in. x 46 in., and 40 in. x 46 in.

1 engine 20 in. x 46 in. with counter shafting pulleys and belting complete.

I Westinghouse revolving field 600 kw., 2 phase, 60 cycles, 2400 volt generator with exciter, switchboard, etc.

1 royal electric 180 kw., 133 cycle, 2400 volt, generator with exciter, switchboard, etc.

The above equipment has been thrown out of use by hydro-electric power and water gravitation system, but would be suitable for a town of 5,000 population.

Machinery can be inspected at any time at the city power house, Fort William.

The successful tenderer must be prepared to have lots awarded to him cleared from the site before the **1st day of September, 1911.**

For further information apply at city engineer's office.

JOHN WILSON,
City Engineer.
May 17, 1911. 21-23

CITY OF TORONTO

Tenders
For a Steel Span
Over the Tracks of the C. P. R At Weston Road

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on **Tuesday, June 20th, 1911**, for the construction of a steel span crossing the tracks of the C. P. R. at Weston Road, in the City of Toronto.

Envelopes containing tender must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained upon application to the Department of Railways, Bridges and Docks, City Engineer's Office, Toronto.

The tenderers shall submit with their tender the names of two sureties (approved of by the City Treasurer, not members of the City Council, or officers of the Corporation of the City of Toronto), or in lieu of said sureties, the bond of a guarantee company approved of as aforesaid.

The lowest or any tender not necessarily accepted.

F. S. SPENCE,
Chairman of the Board of Control.
City Hall, Toronto, May 29, 1911. 23-24

TOWN OF GODERICH

Storm Sewer Extensions

Sealed tenders will be received by the Town of Goderich, addressed to the Town Clerk, until 4 p.m., **Thursday, June 15th, 1911**, for the furnishing and laying of approximately 12,800 lineal feet of storm sewers, building manholes, catchbasins, etc. Plans and specifications may be seen and all information obtained at the Town Clerk's office.

The lowest or any tender not necessarily accepted.

L. L. KNOX, Town Clerk.
M. G. CAMERON, Mayor.

Goderich, Ont., May 27, 1911. 22-23

Tenders For Jail at Guelph

Whole or separate tenders will be received by the undersigned up till **Friday, June 9th**, for the erection of jail and jailer's residence in the City of Guelph, County of Wellington.

Plans and specifications may be seen at the office of the architect, W. A. Mahoney, Telephone Building, Guelph, or at the office of the Contract Record, 220 King street west, Toronto.

Lowest or any tender not necessarily accepted.

T. J. MOORE, City Clerk,
Guelph, Ont.

22-23

CITY OF MOOSE JAW

Sask.

Sewer and Water Extensions

Sealed tenders endorsed "Contract 37 or 36," as the case may be, will be received by the City of Moose Jaw addressed to the undersigned City Clerk until 8.30 p.m. on **Monday, June 19th, 1911.**

Any tender received after the above stated time will be declared informal.

Contract 36.—The laying of approximately 7,900 lineal feet of 24-inch Trunk Sewer.

Contract 37.—The laying of approximately 16,832 lineal feet of sanitary sewer of varying sizes and approximately 19,197 of water main of varying sizes.

Plans and specifications may be seen at the City Engineer's office.

Contract 38.—The supply of approximately:
236 lineal feet of 24-in. c.i. pipe.
358 lineal feet of 18-in. c.i. pipe.
6787 lineal feet of 12-in. c.i. pipe.
4669 lineal feet of 10-in. c.i. pipe.
3598 lineal feet of 8-in. c.i. pipe.
4905 lineal feet of 6-in. c.i. pipe.
Also special castings.

Contract 39.—The supply of approximately
6710 lin. ft. of 24-in. vitrified tile pipe.
526 lin. ft. of 18-in. vitrified tile pipe.
4582 lin. ft. of 10-in. vitrified tile pipe.
11506 lin. ft. of 8-in. vitrified tile pipe.
150 lin. ft. of 6-in. vitrified tile pipe.
Also junctions, bends, etc.

Specifications for 38 and 39 may be obtained from the City Engineer's office upon application.

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer,
Moose Jaw, Sask.
W. F. HEAL, City Clerk,
Moose Jaw, Sask.

22-23

CITY OF CALGARY

ALBERTA

Tenders for Trunk Sewer

Sealed tenders marked "Tender for Trunk Sewer" will be received by the undersigned up till noon on **Tuesday, June 13th, 1911**, for the construction of a six-foot diameter concrete trunk sewer about Twelve Thousand feet (12,000 ft.) long for the City of Calgary.

Each tender must be accompanied by an accepted bank cheque for $500 payable to the City Treasurer, which will be returned to the bidder unless he fails to execute a contract, should it be awarded to him.

The successful bidder will be required to execute a bond in the sum of Thirty Thousand ($30,000) for the faithful performance of the contract and a guarantee of maintenance for one year after the contract is completed.

The City reserves the right to reject any or all tenders.

Plans and specifications can be seen at the office of the City Engineer at Calgary; the office of the Contract Record, Toronto; office of Canadian Engineer at Winnipeg, and the Engineering Record, 239 West 39th street, New York.

W. D. SPENCE,
City Clerk.

22-23

Department of Railways & Canals, Canada

Hudson Bay Railway

NOTICE TO CONTRACTORS

Sealed tenders addressed to the undersigned and endorsed "Tender for construction of Hudson Bay Railway," will be received at this office, until 16 o'clock on **Tuesday, the 1st of August**, for a section of about 185 miles from Pas Mission to Thicket Portage.

Plans, specifications and form of contract to be entered into can be seen on and after **Wednesday, May 31, 1911**, at the office of the Chief Engineer of tne Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Hudson Bay Railway, Winnipeg, at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind, that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $200,000 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, May 26, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 23-24

BOARD OF EDUCATION

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board will be receided until **Monday Noon, June 12th, 1911**, for the several trades required in the enlargement of

EARL GREY SCHOOL
FRANKLAND SCHOOL
MIDSUMMER REPAIRS (all trades).

Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied with an accepted bank cheque for five per cent. of the amount of tender or its equivalent in cash.

The lowest or any tender will not necessarily be accepted.

W. W. HODGSON,
Chairman of Committee.
W. C. WILKINSON,
Secretary-Treasurer.

Toronto, Ont., June 1, 1911. 23-23

TOWN OF NORTH BAY

Tenders For Laying Sewer Pipes, etc

Sealed tenders, addressed to the undersigned, will be received up till 12 o'clock noon on **Thursday, 15th June, 1911**, for all labor necessary for laying approximately 25,000 lineal feet of Sewers, ranging from 6-in. to 36-in., in the Town of North Bay; and furnishing certain materials therefor, according to Specifications, Plans, and Profiles, to be seen in the Office of the Commissioner of Works, North Bay.

All pipe will be supplied by the Corporation, on board cars at North Bay; the Contractor to unload and do all handling.

Work must be commenced immediately after awarding the contract.

The lowest or any tender not necessarily accepted.

T. N. COLGAN,
Commissioner of Works.

North Bay, May 31, 1911 23-23

CITY OF TORONTO

Tenders

For the Construction of a Concrete Floor Slab and a Reinforced Concrete Bent at the Western Road Bridge

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on **Tuesday, June 20th, 1911**, for the construction of a concrete floor slab on a steel span crossing the tracks of the C. P. R. at Weston Road in the City of Toronto, and a reinforced concrete bent under the north end of the said steel span.

Envelopes containing tender must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained upon application to the Department of Railways, Bridges & Docks, City Engineer's Office, Toronto.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman of the Board of Control.

City Hall, Toronto,
May 29, 1911

TOWN OF BATTLEFORD

Saskatchewan

[illegible] addressed to the Town Council of Battleford, will be received until noon, [illegible] for the material and construction of [illegible] works and sewerage system.

Plans may be seen and schedules of quantities, specifications, etc., obtained at the office of the Town Engineer.

Each tender must be accompanied by an accepted bank cheque on a chartered Canadian bank equal to five per cent. (5 per cent.) of the contract price.

H. C. ADAMS,
Secretary-Treasurer.
WM. KITSON,
Town Engineer.

[illegible]-24

TOWN OF STEELTON

PROVINCE OF ONTARIO

Notice to Contractors

OUTFALL SEWER

Sealed tenders will be received by the Town Clerk until 8 p.m. **Saturday, June 10th, 1911,** for the construction of a Reinforced Concrete Outfall Sewer about 570 feet in length and 66 inches interior diameter.

Plans and specifications will not be sent out to contractors, but may be seen at the office of the Engineers, Toronto and Steelton. Correspondence should be addressed to the Toronto office.

A certified cheque for **$1,000** shall accompany each tender.

The lowest or any tender not necessarily accepted.

JAS. LYONS, Esq., Mayor,
Steelton, Ont.
J. ROBINSON, Esq., Town Clerk,
Steelton, Ont.
CHIPMAN & POWER, Engineers,
Toronto, Ont.

23-23

TOWN OF NORTH BAY

Tenders

For

Supply of Sewer Pipe

Tenders will be received by the undersigned, for the Corporation of North Bay, up till noon on **Thursday, 15th June, 1911,** for the supply of Sewer Pipes as shown below.

Pipes to be delivered f.o.b. cars at North Bay, and delivery to commence not later than one week after contract has been awarded, and to continue as fast as may be required.

Approximately 5,700 lineal feet 10-in. Pipe. (Vitrified Tile).
Approximately 1,260 lineal feet 20-in. Pipe.
Approximately 2,720 lineal feet 24-in. Pipe.
Approximately 1,800 lineal feet 30-in. Pipe.
Approximately 1,520 lineal feet 36-in. Pipe.
Approximately No. 575 10 x 6 in. T Junctions.
Approximately No. 335 20 x 6 in. T. Junctions.
Approximately No. 200 24 x 6 in. T. Junctions.
Approximately No. 120 30 x 6 in. T. Junctions.
approximately 102 x 26 in x 6 in.
Approximately No. 80 20 x 8 in. T. Junctions.
Approximately No. 60 30 x 8 in. T. Junctions.
Approximately No. 20 36 x 8 in. T. Junctions.

Parties tendering are requested to submit a tender for the 20-in., 24-in., 30-in. and 36-in. Pipe in Cement Concrete as well as Vitrified Tile.

The lowest or any tender not necessarily accepted.

T. N. COLGAN,
Commissioner of Works.

North Bay, May 31, 1911. 23-23

Tenders for Sidewalks

will be received by the undersigned until 8 p.m. of **Monday, the 19th June, current,** for the construction of $3,000 worth of Cement Sidewalks.

A marked cheque for $50 must accompany tenders.

The lowest or any tender not necessarily accepted.

For specifications apply to

D. H. MINAKER, Town Clerk,
Cobourg, Ont.

June 11, 1911 23-24

TOWN OF STETTLER

Alberta

Electric Light

Sealed tenders addressed to the undersigned will be received until 18 o'clock on **Monday, 3rd July, 1911,** for the following:—

One 125 k.v.a. Generator, Exciter, and Switchboard.

One Tandem Compound Steam Engine.
One 72 in. x 16 ft. Boiler and Stack.
Cedar Poles and Pole-line material.
Erection of Pole-line.

Specifications and all information may be obtained at the offices of the engineers, the John Galt Engineering Co., 317 Portage avenue, Winnipeg.

The lowest or any tender may not be accepted.

DAVID MITCHELL,
Town Commissioner,
Stettler, Alberta.

23-23

Sealed tenders addressed to the undersigned, and endorsed "Tender for Breakwater at Bare Point, Port Arthur, Ont.," will be received at this office until 4 p.m., **Wednesday, July 5, 1911,** for the construction of a Breakwater at Bare Point, Port Arthur, Electoral District of Thunder Bay and Rainy River, Ont.

Plans, specifications and form of contract can be seen and forms of tender obtained at this Department and at the offices of E. B. Temple, Esq., District Engineer, Port Arthur, Ont.; J. G. Sing, Esq., District Engineer, Confederation Life Building, Toronto; H. J. Lamb, Esq., District Engineer, London, Ont.; and J. L. Michaud, Esq., District Engineer, Merchants' Bank Building, St. James street, Montreal, Que.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation, and place of residence of each member of the firm must be given.

Tenders are asked for two modes of construction, and each contractor must send in with his tender an accepted bank cheque on a chartered bank, payable to the order of the Honourable the Minister of Public Works, equal to ten per cent. (10 p.c.) of the amount of the higher of the bids, which cheque will be forfeited if the contractor decline to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,
R. C. DESROCHERS,
Secretary.

Department of Public Works,
Ottawa, June 2, 1911.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 23-24

CITY OF KINGSTON

Notice to Paving Contractors

Sealed tenders under registered post only, addressed to the undersigned, will be received by the Board of Works up till 12 o'clock noon, **Saturday, June 24th, 1911,** for the construction of:—

15,000 square yards of asphaltic macadam;
9,700 lineal feet of curb and gutter.

Plans and specifications are also on file at the office of the Contract Record, 220 King street west, Toronto.

The lowest or any tender not necessarily accepted.

H. B. R. CRAIG,
City Engineer.

June 5th, 1911. 23-24

CITY OF PRINCE ALBERT

Tenders for

POWER WORKS

Sealed tenders will be received up until noon, **Monday, June 26th, 1911,** by the Corporation of the City of Prince Albert, Province of Saskatchewan, for the construction of

Power Station Superstructure and Transmission Line

being portions of the proposed hydro-electric power development on the North Saskatchewan river at La Colle Falls (distant 25 miles east of the city).

Tenders are invited on each separately and must be plainly marked on the outside of envelope and addressed to the Secretary-Treasurer, City of Prince Albert, Saskatchewan.

Each tender must be accompanied by an accepted bank cheque for $500, payable to the Secretary-Treasurer, which cheque will be returned to the bidder unless he fails to execute a contract should it be awarded to him.

The successful bidder on each of the works will be required to execute a bond in the sum of $3,000 for the faithful performance of the contract.

The city reserves the right to reject any or all tenders.

The plans and specifications will be on file and may be seen on and after June 8th, 1911, at the City Hall, Prince Albert; office of "Canadian Engineer" at Winnipeg and Montreal, or at the offices of the Engineers, C. H. and P. H. Mitchell, Traders Bank Building, Toronto.

ANDREW HOLMES, Mayor.
C. O. DAVIDSON, Secretary-Treasurer.

Prince Albert, Sask.
June 1st, 1911. 23-24

Miscellaneous

Advertisements under this heading two cents per word per insertion. Minimum charge 50 cents

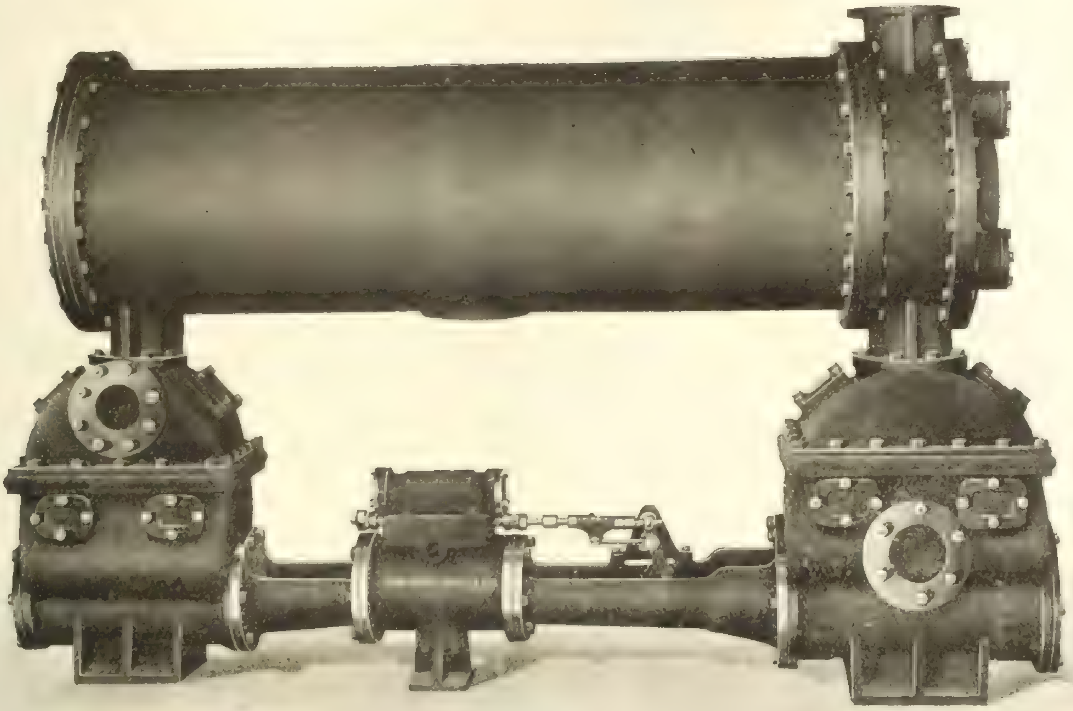
REPRESENTATIVE WANTED

An American company manufacturing Thomas Locking System special Sectional Sheared Bar for reinforcing concrete, want an engineer to handle the sales end of their business on shares. Address, Box 282, Contract Record, Toronto, Ont. 23-24

REPRESENTATIVES WANTED

Large American firm manufacturing a product for making dustless roads desires to secure competent representatives in eastern and western Canada who have connection with municipal authorities and town and city engineers. A1 proposition. Apply Box 284, Contract Record, Toronto, Ont. 23-24

Condensors



Condensor built by The John Inglis Co., Limited

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

Let us Submit Prices.

The **John Inglis Company**
Engineers and Boilermakers Limited
14 Strachan Ave., TORONTO, Canada

Unclassified Items

Brandon, Man.

Local architects will be invited to submit plans for erection of St. Matthias church on 13th street. No further details as yet.

Brantford, Ont.

Tenders received by Geo Wedlake until June 10th for erection of Methodist church. Architects, Taylor & Taylor, Brantford.

Calgary, Alta.

Tenders are called about July 15th for erection of 3-storey business block for L. R. Burns, Calgary. Solid brick, concrete, steam heating, electric lighting, tar and gravel roof, 99 x 110. Tenders received after July 1st.

Chatham, Ont.

Tenders addressed to W. G. Merritt, city clerk, will be received until June 12th for construction of glazed pipe sewers.

Tenders addressed to Ward Stanworth, 80½ King street, will be received until June 11th for erection of packing house, $15,000, for O'Keefe & Drew. Plans call for 2-storey and basement, concrete foundation, construction, slow burning wood, roof, steel construction, cut stone reinforced concrete, vaults, freight elevator, sheet metal fireproof doors and windows, electrical work, refrigerator.

Hamilton, Ont.

Recent building permits include: E. Stewart, two frame dwellings, on Francis street, for J. Smithen, $2,250; Stewart & Witton, for the erection of a brick I. O. O. F. temple building, on Gore street, $45,000; W. A. Edwards, for the erection of a brick addition to factory building, 47 Main street east, $6,000; J. W. Cummings, for the erection of a brick dwelling on Blythe street, between Stinson and Alanson streets, for S. Jones, $2,000.

Kingston, Ont.

Tenders are called until June 24th for construction of paving, 15,000 square yards asphaltic macadam, 9,700 lin. ft. of curb and gutter. H. B. R. Craig, city engineer. Advertisement in "Tenders and For Sale Department" of this issue.

Medicine Hat, Alta.

Plans are being prepared for office building, $20,000, brick, 2-storeys, concrete foundation, for W. Cousins. Architect, Mr. Trimble.

Plans are being prepared for erection of theatre for Ready & Purley, Medicine Hat, $25,000, brick and stone, concrete foundation, structural iron, fire escapes, fireproofing material.

No tenders will be called for labor on the 30,000 square yards of cement walks to be laid costing $55,000. City owns plant and will use steel forms. A. K. Grimmer, city engineer.

Work will commence shortly on a foundry for E. L. Davis, $7,500. Specications call for concrete foundation, metal siding, frame construction, gas heating and lighting and patent roofing. Work will be done by day labor.

Plans are being prepared for construction of mill for Alberta Linseed & Paint Co., $75,000. They call for concrete foundation, frame construction, gas lighting, gas heating, patent roofing, 3-storey, cement and structural iron, metal siding. Bonus received from city. Additional information later.

Re erection of St. Barnabas church. Tenders were received from Clemsha & Coltman, Regina. Tenders exceeded estimate fifty per cent., and vestry felt that they could not finance this amount, so parish is asking for competitive plans not to exceed $25,000, and to include heating, plumbing, electric wiring and fixtures and congregational seating capacity of 400. Plans must be in by June 16th. J. H. Collier, secretary of vestry.

Tenders are to be called at once.ofr one and one-half storey residence for F.

Ottawa, Ont.

V. V. Rogers is calling for tenders for removing 40,000 cubic yards of filling. It is to be moved about 800 feet.

Tenders received after June 1st for residence for Miss Lane. Plans call for brick veneer, 2½ storeys, hot water heating. Architect, J. P. MacLaren. Sparks street.

A capitalist, supposedly George H. Perley, has made a donation of $50,000 towards a hospital for incipient tuberculosis patients in Ottawa. It is probable that the work will be begun soon.

Tenders are called until June 9th for erection of 2-storey factory for McFarlane & Douglas, Slater street. Only masonry and carpentry being called for just now. Architect, J. A. Ewart, 193 Sparks street.

Tenders have been received for cement pavements for Somerset street from Bronson avenue to Division street. They are: Union Construction Company, $24,258; Barber Asphalt Company, $26,000; Ottawa Construction Company, $24,820. The tenders for the King Edward avenue paving were: Barber Asphalt, $12,180; Union Construction Co., $11,465, and the Ottawa Construction Company, $10,987. The board of control has recommended the lowest tender in each case be accepted.

Renfrew, Ont.

Tenders will be called within 30 days for erection of residence for J. A. Jamieson. Plans call for 2½ storeys, brick and stone foundation.

Regina, Sask.

Recent building permits include: W. G. Dand, Victoria avenue, brick dwelling and barn, $6,900; J. A. Wright, Sixteenth avenue, brick dwelling, $6,500; John Ingram, Robinson street, frame dwelling, $3,000; J. F. Anderson, Smith street, brick dwelling, $10,000; Western Trust Company, Eleventh avenue, block of offices, $70,000; Cameron and Heap, Dewdney street, warehouse, $45,000; Methodist College, Sixteenth avenue, college, $275,000; fire hall, Scarth street, new fire hall, $15,000; power house, Dewdney street, addition to power plant, $7,000; exhibition buildings, cost $53,500; R. M. Moore, Albert street, store and dwelling, cost $3,000.

Toronto, Ont.

Tenders addressed to the chairman, joint building committee of the Y. M. C. A., will be received until June 20th for erection of Central Building, Nos. 22-40 College street. Architects, Burke, Horwood & White, 28 Toronto street.

Vancouver, B.C.

Tenders are called for 5-storey brick mill and reinforced concrete construction, concrete foundation, plumbing, heating, electric wiring. Owner, G. H. Cottrell, 139 Water street; architects, Parr & Fee, 570 Granville street, Vancouver.

Recent building permits include: Parsons & Haddock, brick warehouse, four storeys, Hamilton street, $35,000; National Finance Company, alterations, Pender street, $6,000; J. C. Waghorn, additions, 1670 Beach avenue, $3,500; R. Evans, dwelling, 3050 Hemlock street, $10,500; Peter Faulkner, frame dwelling, 2298 First avenue west, $3,500; Boyd & McWhinnie, six-storey brick building, Cordova and Columbia, $60,000; W. D. McKenzie, frame dwelling, 416 Sixteenth avenue east, $5,000; W. J. Dickinson, 628 Harris street, $8,000; Jefferson & Clapham, 1433 Twelfth avenue, two houses, $2,800; W. Tinney, 2932 Sophia street, $9,000; T. W. Nixon, 2223 Parker street, $3,000; Hawes & Rowlatt, 2907 Woodland drive, $4,000; W. H. Creitz, 2318 McDonald street, $4,000; Provincial Government, Normal school grounds, $2,680.

West Oxford Tp., Ont.

Plans are being prepared for erection of 1-storey school, $4,000. Plans call for cement foundation, 27 x 44, hot air heating, slate roof, metal ceiling. Tenders received after June 15th, close June 30th. Architect, Taylor & Taylor, Brantford.

Wilkie, Sask.

Tenders are received until June 10th for the drilling of a well up to 300 feet in depth for a 6 in. or 8 in. casing. T. A. Dinsley, secretary-treasurer.

Whitby, Ont.

Two by-laws, one to ratify an agreement with the Seymour Electric Power Company to supply power to the town, and the other to establish a free library, were carried.

AWARDED

Chatham, Ont.

The sub-contracts for erection of Church and Rectory, Pain Court, have been awarded as follows: heating and plumbing, Mitchell Bros., Chatham; iron work, F. Callahan, Chatham; general contractor, Blonde Lumber Mfg. Company.

Hamilton, Ont.

The contract for erection of Colonial Theatre for the Colonial Theatre Co., Hamilton, has been awarded to G. E. Mills, 614 King street east, Hamilton, $20,000. Architect, J. A. Armes, Hamilton.

Medicine Hat, Alta.

The contract for brick manholes has been awarded to John Farrer, Redcliff, at $1.25 per foot high. Other tenders were John Petitt, Medicine Hat, $1.80; Geo. Worthy, Medicine Hat, $2.00, and Hotson & Leader, Lethbridge, $2.25 per foot high. A. K. Grimmer, city engineer.

Souris, Man.

The general contract for erection of public school here was awarded to A. E. Bullock, Brandon. Contracts for heating and plumbing not let yet. Contract originally awarded at same figure to Piggott & Son, Hamilton.

Woodstock, Ont.

The contract for erection of building for Ken Knit Co. was awarded to J. W. Taylor, Woodstock, on May 27th. Building to be completed September 15th.

The "ENGBERG" VALVE

A Gate Valve operated by hydraulic cylinder with electric controlling device.

No waterworks system, having a standpipe or reservoir, can afford to be without this valve, a most valuable adjunct, increasing the effectiveness when fire pressure is desired and permitting a reduction in the cost of maintaining ordinary domestic pressure.

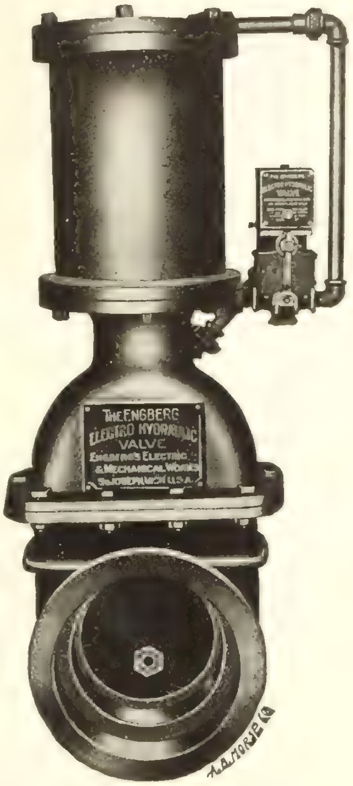
We are sole agents for Canada.

A waterworks Superintendant writes—

"It has given us entire satisfaction; it is a time-saver on getting direct pressure to the city in case of fire. We could not get along without it."

Read what a Fire Chief says—

"Your electric shut-off valve has been a great assistance to us in putting out fires, as it enables the engineer at the pumping station to increase the water pressure in an instant, whereas it took from twenty to thirty minutes to change before the same was put in; a man having to go to the stand pipe and close the valve and also telephone to the engineer notifying him of the same. Now it is all done at the pumping station, and by the time we are able to make connections we have direct pressure. Any chief knows what it is to try and fight fire without sufficient water pressure."



The John McDougall Caledonian Iron Works Co.

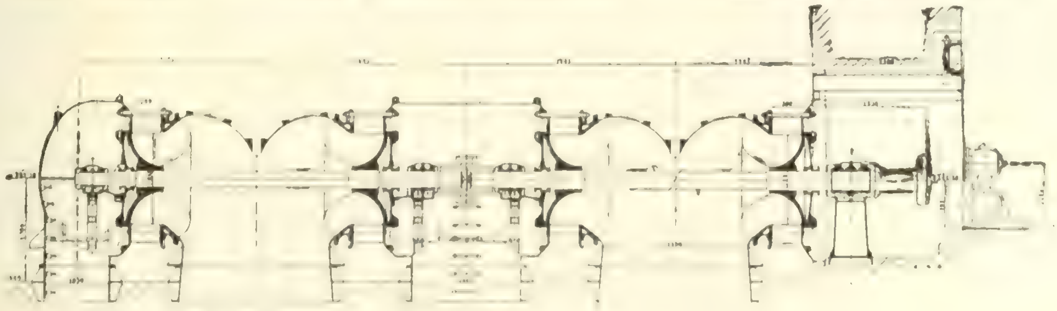
LIMITED

WORKS—
512 William Street, MONTREAL

SALES OFFICES—
Montreal, Toronto, Winnipeg, Cobalt, Calgary, Vancouver.

WATER-POWER PLANTS LOW PRESSURE TURBINES

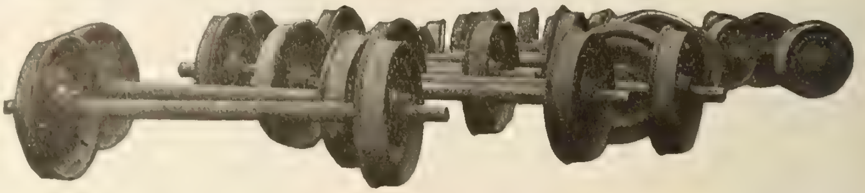
Any Output. **5,000 Turbines Supplied.** **2,000,000 Horse Power.**



26 ft. Head. 5,000 H. P.
Four Units as illustration on order for the German-Swiss Water Power Company

ESCHER WYSS & CO. - ZURICH, SWITZERLAND

CANADIAN HEAD OFFICE, 408 LUMSDEN BUILDING, TORONTO
PHONE, ADELAIDE 234



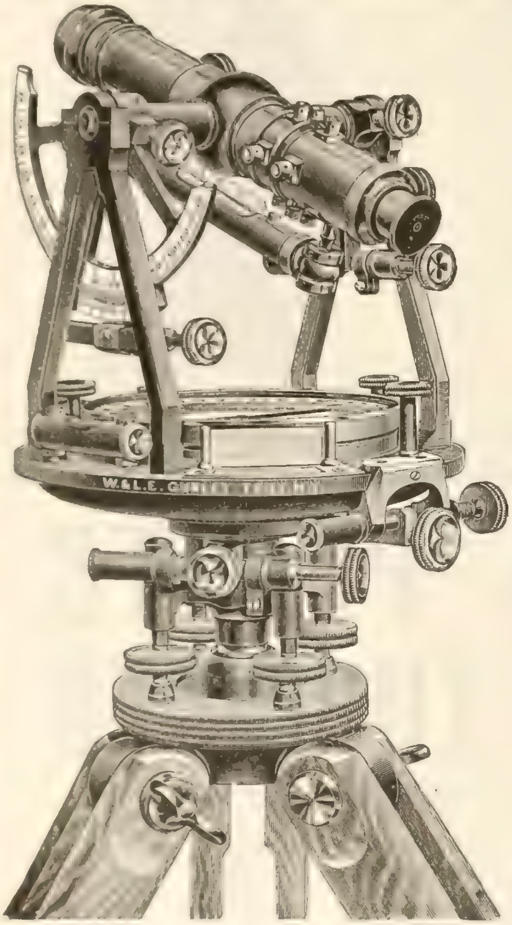
RAILWAY CONSTRUCTION PLANT

Hoisting Engines, Horse Powers, Hand Winches, Derricks, Car Wheels, Axles and Boxes, Dump Cars, Rail Cars, Buckets

MARSH & HENTHORN, Limited
Makers of Hoisting Machinery, BELLEVILLE, ONT.

Send for Catalogue

SALES AGENTS
MUSSENS
LIMITED
Montreal, Que.



1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

Transits
Y Levels
Compasses
Plane Tables
Current Meters
Levelling Rods
Chains
Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

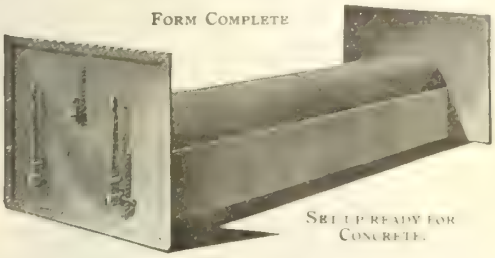
Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO
Branches: Vancouver and Winnipeg
Montreal

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.



Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

WRITE FOR FORM CATALOGUE
ENGINE CATALOGUE FOR THE ASKING
COMMISSIONER'S TIME BOOK FREE

Concrete Form & Engine Co.

Successor to Collapsible Steel Form Co.

83 Congress St., W., Detroit, Mich.

"A little fore-talk may save much after-talk in building—it is wisest to install the best first."

—The Philosopher of Metal Town.

Specify in the Contract

"Metallic"

Ceilings and Walls

When your specifications read "Metallic Ceilings and Walls", you are doing more than simply erecting a building — you are insuring **absolute satisfaction** for all parties concerned.

"Metallic" Ceilings and Walls are made of superior quality sheet steel—fit accurately, are durable and never sag, crack or fall off.

The exclusive patterns are varied and extensive, beautiful in design and very heavily embossed.

Our booklet, "Interior Decoration in Metal," will interest you. Write for it, also our new catalogue, No. 70—it contains valuable information on Metallic Building Materials.

Manufacturers 1952

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

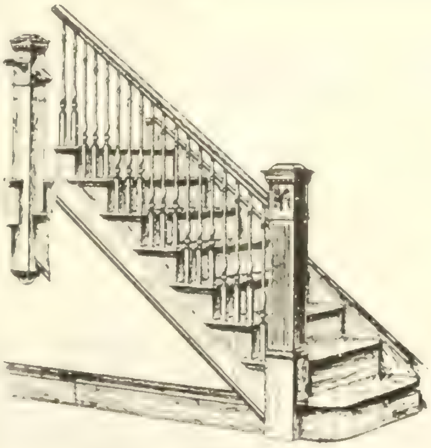
Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City



We make a **Specialty** of **STAIR WORK**

and are well equipped to fill your orders both promptly and properly.

Send along your plans and specifications and let us quote you.

Bryan Manufacturing Co.
Limited
COLLINGWOOD, ONTARIO

The Smith Marble and Construction Co., Ltd.

Montreal

Office & Factory:
145 Van Horn Ave.

Show Rooms:
458 Blury Street

Importers,
Manufacturers,
Contractors

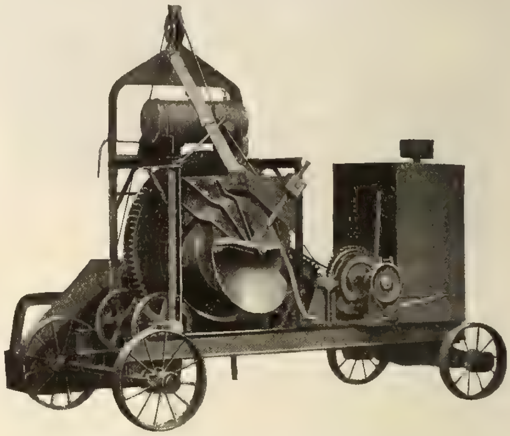
OF

Interior and Exterior Marble, Slate, Floor and Wall Tiles, Mosaics, Plumbers and Electrical Marble, Granites for Building and Monumental Work.

The Foote Concrete Mixer

For
STEAM — GASOLINE — ELECTRIC — BELT
POWER

Low Charging—Thorough and Rapid Mixing—
Rapid Discharge



Any capacity, and special designs for special conditions

The General Machinery Co., Ltd.
526-7 Traders Bank Building
TORONTO, ONT.

Toronto Pressed Brick and Terra Cotta Works

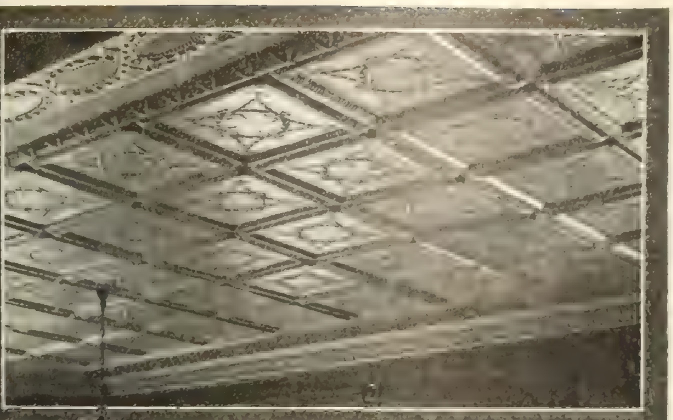
BRICKS

ROOFING AND FLOORING TILE, CRESTINGS, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given
to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS
Head Office - - MILTON, ONT.
C. J. LEWIS, Proprietor
Montreal Agent: E. F. DARTNELL, 157 St. James St.
Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade



WHEN YOU THINK OF METAL CEILING THINK OF "GALT"

"Galt" Art Metal Ceilings are sold strictly on their merits, their **mechanical superiority** and faithfulness to art in styles they typify.

Machine-cut beads (patented process) make them easy to apply. Plates snap into place and seams fit snugly together. Why waste your time puttying and peening the joints on old-fashioned stuff when the new is here and costs less?

Write us about your Metal Ceiling work

THE GALT ART METAL CO.,
GALT - ONT.

Enameled Brick

FOR EXTERIOR AND INTERIOR DECORATING AND CONSTRUCTION

Used in all modern buildings where the maximum amount of light and sanitary conditions are essential

Summary of Classified List of Jobs

No.	JOBS	1st. Quality	2nd Quality
104	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,991	412,545
50	Private Residences	1,023,250	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and Fire Houses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

Send for Catalogues and Color Sheets

American Enameled Brick & Tile Co.

1182 Broadway, NEW YORK CITY
Local Agents in Montreal, Toronto and Ottawa.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange

JAS. DICKSON, Pres. GEO. T. DICKSON, Vice-Pres.

Dickson Bridge Works Co.

Campbellford, Ont. Limited

Bridge over Spanish River at Massey, Ont.

Steel Bridges, Steel Buildings Roof Trusses

and other Structural Steel

Foundry and Machine Shop in connection.
Estimates on application

INDUSTRIAL - CONTRACTORS - EQUIPMENT

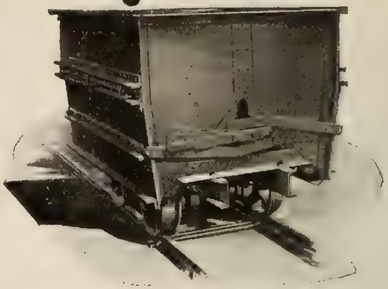
Lifting gate End Dump Car

We make these any guage, any size, style and number.

We make chutes of all kinds. For chuting concrete—coal—sand—anything.

Write for our Catalog No. 31-A

We make a specialty of Heavy Sheet Steel work.



Gable bottom car; all sizes

High Quality
Low Prices
Quick Shipments

SACKETT - CHICAGO

1691 Elston Ave., Chicago, Ill.

CONCRETE

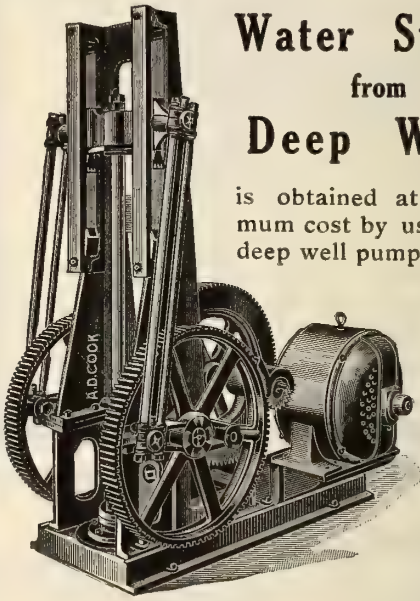
Culvert and Sewer Pipe

ARE you responsible for the construction and ultimate satisfaction of a sewer or culvert? The material for such work should be something that will last for ever. Concrete improves with age and will give permanent satisfaction.

If you compare "North" Concrete Culvert and Sewer Pipe with other makes you will use "North".

Ebenezer North Co.

LONDON, ONTARIO



Water Supply from Deep Wells

is obtained at a minimum cost by use of our deep well pumps.

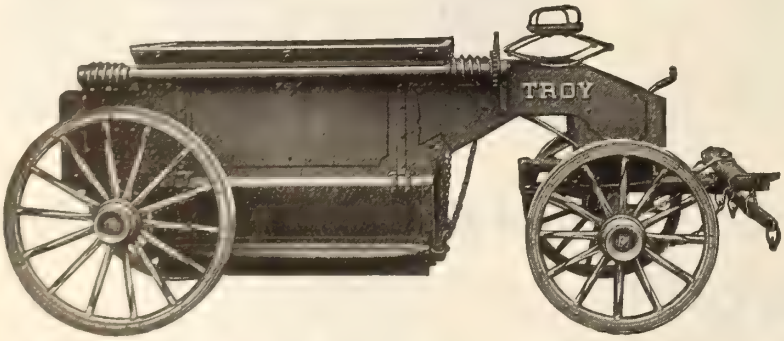
Write for Bulletin 26 explaining the use of Cook's Patent Brass Tube Well Strainer

A. D. COOK

Lawrenceburg, Indiana, U. S. A.

Manufacturer of a Complete line of **DEEP WELL SUPPLIES** including Steam, Belt and Motor Driven **DEEP WELL PUMPS**, Wind-mill and Hand Pumps, Working Barrels and Valves, Pump Rods and Pump Rod Joints, Drill Rods and Drill Rod Joints, Drilling and Well Tools.

CATALOGUE MAILED UPON REQUEST.



Chuckles like a Circus Wagon

THE TROY SPECIAL

The Lightest Running Dump Wagon Ever Built.

A short-coupled 8 ft. 4 in. wheel base TROY Dump Wagon.

Weight only 1890 lbs.—this with the short couple makes it a Godsend for your horses.

Low down—4 ft. 8½ in. high. Easy to shovel into.

6500 lbs. capacity—strong enough for steam shovel work.

The wagon you have been looking for—low, light-running, sturdy. You can use lighter teams and cut your investment. Meets all the needs of the contractor. Works equally well with hand shovels, road excavators or steam shovels.

The price will astonish you—get it. Ask for Catalog Z.

The Troy Wagon Works Co. **N. Market Street** **Troy, Ohio**

The Meaford Wheelbarrow Co., Limited

MEAFORD, ONT.

Manufacturers of

Wheelbarrows of every description, for every purpose. If it is a Wheelbarrow you want we have it in Railroad or Navy, Steel Tray or all Steel, Garden or Lawn.

Wheel Scrapers, pressed bowl or square box in two sizes Nos. 2 and 3.

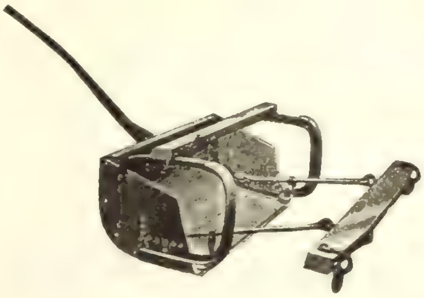
Drag Scrapers, pressed steel handles on top or sides, with or without runners.

Ox Shovels, Fresno or **Buck Scrapers**

Dump Carts, Dump Cars, Grading Ploughs

Trucks, Bag, Warehouse, Platform

Sterling line of Roller Bearing easy pushing Concrete Wheelbarrows and Carts



Write for prices and complete catalogue

THE MILTON PRESSED BRICK CO. LIMITED

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance—it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

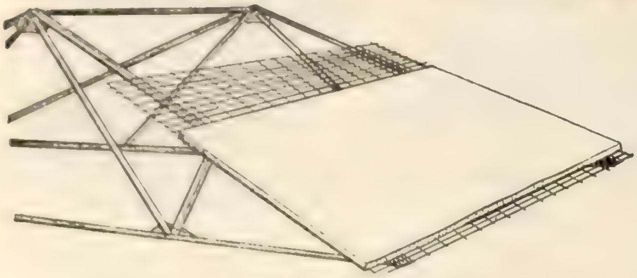
We are Agents for the Fiske Tapestry Brick, suitable for high-class residential work. At our Toronto Office we have set up panels of the different color schemes and would be pleased to have you call and examine them.

Head Office: Milton, Ont. **Toronto Office: Janes Building**

EADIE-DOUGLAS LIMITED, Ottawa Agents

Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

Concrete Reinforcement



Our Bonding is a Crimped STEEL WIRE Fabric

Can be made in any Length or Width to suit you.

We claim in the erection of roofs and floors our continuous reinforcement has no superior, inasmuch as it knits the entire mass into an actual monolithic slab, weak at no point and so tied together that in case of accident from any cause whatever, no single section would fall but would be sustained by carrying capacity of wires running in continuous lengths over top of roof trusses or purlins

Inquiries Solicited

When in Need of——

Ornamental

Wire and Iron Work

SEND US YOUR ENQUIRIES

We specialize in

Jail and Prison Work

Canada Wire Goods Mfg. Co., Hamilton

Coal Conveyor Loaded.

SCANDINAVIA
FEDERAL ENGINEERING & SUPPLIES LTD.
TORONTO
BELTING

For Conveying
and
Transmission

A Good Belt Dressing.

Federal Engineering & Supplies, Ltd.

284 Yonge Street, Toronto.
329 St. James Street, Montreal.

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

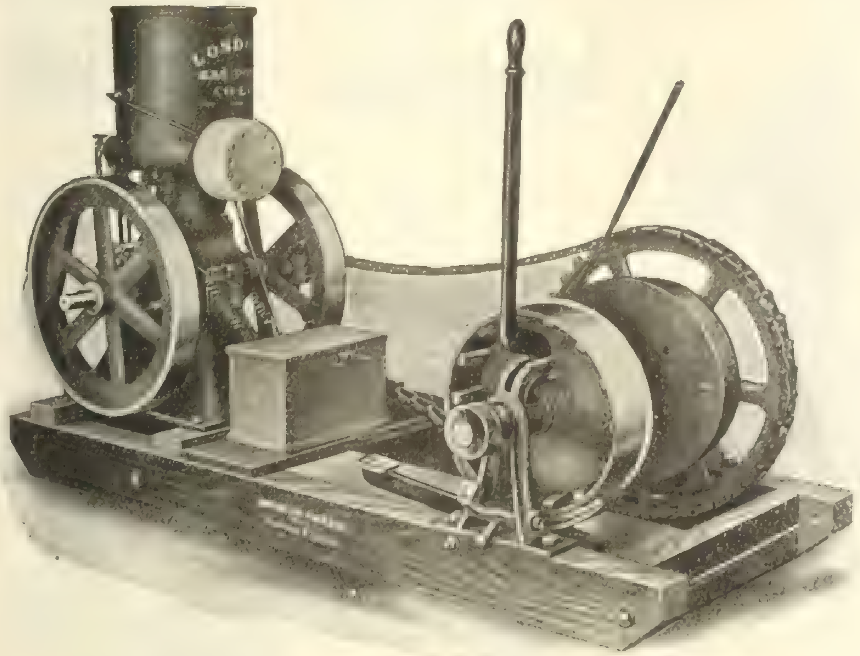
---

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager



Complete 5 H. P. Hoisting Outfit, Operating Side

Here is a Hoisting Outfit that Has Saved Money Let it Save Yours

A "**London**" self contained engine mounted on the strong bolted frame with our famous **"London" Friction Clutch Hoist** with ball bearing thrust, will give you an outfit hard to beat.

The gearing consists of sprockets and heavy malleable iron chain.

Send for our Literature which contains complete description of the above outfit.

The London Gas Power Company Limited, London, Canada

ENGINEERS and MACHINISTS

Improved Singer No. 4 Block Machine

Our catalogue K [illegible] information and [illegible]

It Makes

Face Down Blocks

Blocks 4", 6", 8", 10" 12", 16" and 24" long 4", 6", 8", 10" and 12" wide.

All Blocks on One size Pallet.

[illegible]

Vining Mfg. Co.

Niagara Falls, Ont.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

ROBERT W. HUNT, President
THOS. C. IRVING JR., Vice-Pres.

JAS. W. MOFFAT, Secretary
CHAS. WARNOCK, Treas. & Man.

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, CANADIAN EXPRESS BLDG., MONTREAL, QUE.
Branch Offices, TRADERS BANK BUILDING, TORONTO, ONT.
Norfolk House, LAURENCE POUNTNEY HILL, LONDON, ENG.

Note tremendous metal weight on this floor. Entire building of Alsen's Cement reinforced concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

for concrete reinforcement is made from high carbon, cold drawn wire. The process of cold drawing eliminates the possibility of flaws. Perfection Wire Mesh is necessarily perfect.

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

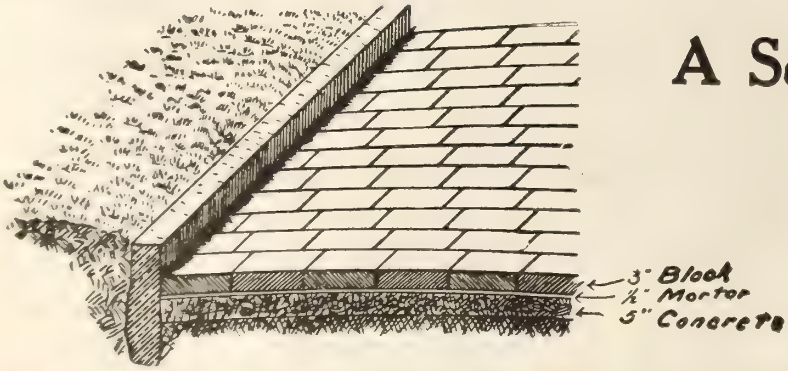
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Lap Welded Steel Pipe

MADE IN SIZES

12 to 72 inches Diameter

Used extensively for Water Supply for Mines, Mills, Hydraulic Operations and High Pressure Hydro Electric Installations.

Ask our Welded Pipe Dept. for prices.

American Spiral Pipe Works

MANUFACTURERS OF

SPIRAL RIVETED PIPE LAP WELDED PIPE
FORGED STEEL FLANGES

50 Church St. New York Box 485 Chicago, Ill.

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)

"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."

W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.

1032 Garfield Building, CLEVELAND, OHIO

SELLING AGENTS
The Dominion Equipment & Supply Co., Winnipeg, Canada

Guelph
Hydrated Lime

Will **Save** You **$ $ $ $ $ $ $ $**

It is cheaper and better than lump lime—if it wasn't nobody would buy it.

Cheaper because it goes farther, will not slack in air, keeps in any climate, saves time and is more easily handled.

Better because it makes whiter, stronger and denser plaster.

Specify **Guelph Hydrated Lime** when ordering from your dealer. You'll be surprised at the saving.

Standard White Lime Co.

Guelph - Ontario

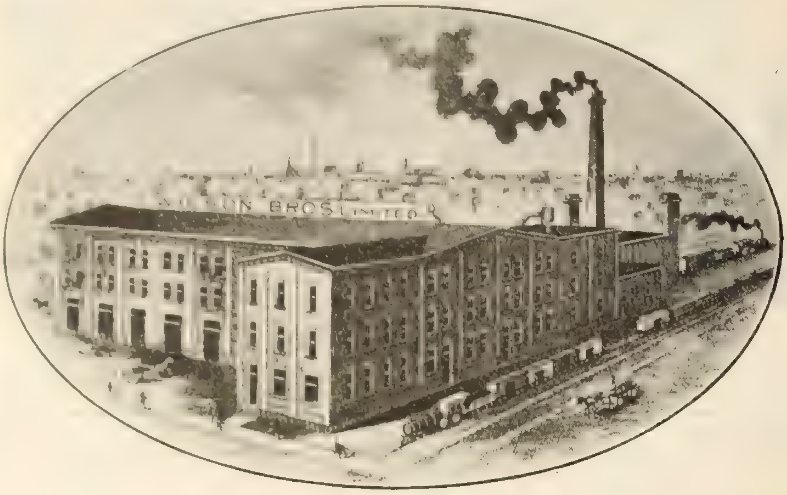
EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No 1 22 x 16 x 13 No. 2 27 x 16 x 13 No. 3 33 x 22 x 18

Send for our illustrated booklet, it shows and describes our full line of Coal Chutes.

The Down Draft Furnace Co., Limited

Galt, Ontario, Can.



Hardwood Flooring and Interior Finish

"Wilson Bros. Limited" on flooring means a carefully kiln dried and well manufactured article. Our flooring is straightened, hollow-backed, bored, end-matched, steel polished and bundled. -:- -:- -:-

We specialize in Veneered Doors to detail.

Wilson Bros. Limited **COLLINGWOOD, ONT.**

The Mushroom System

Of Reinforced Concrete is strong, economical and durable. Based on scientific principles, every pound of steel does the work it is designed to do.

The system is fully covered by broad patents in Canada, the United States, and all civilized foreign countries.

For lists of buildings, descriptive literature and estimates, address

C. A. P. Turner, M. Am. Soc. C. E.
816 Phœnix Building, Minneapolis, Minn.

IRON STAIRS

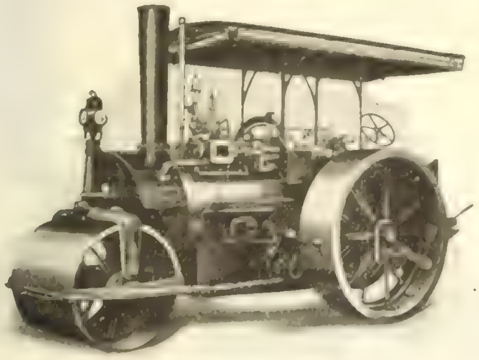
Dennis Wire & Iron Works Co.
London, Canada Limited

Toronto Offices - 12 QUEEN STREET E.

Cut shows a four wheel steam Locomotive Crane with 40ft. boom handling forms on New York Catskill Aqueduct at Valhalla, N.Y. These contractors are finding our cranes indispensable in this work, as they can be used for so many purposes; such as handling loose materials as broken stone, sand, concrete, etc., heavy timbers, rails, concrete forms, etc.

THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND, OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City

There are over 100 Waterous Rollers in use in Canada to-day



The Waterous Roller
"A Canadian Roller for Canadian Roads."

That means that there is at least one in use in every province in the Dominion, working on all kinds of roads, under all sorts of conditions. Their universal success proves their right to the title "The Canadian Good Roads Pioneer."

The Waterous Roller is built in three sizes, 10, 12 and 15 tons. Carries a double crank engine, a quick-steaming locomotive type boiler of large capacity has two speed gearing cut from the solid steel for fast and slow work. Supplied with all standard engine and boiler fittings.

If there is no Waterous Roller in your neighborhood, write for our complete Roller catalogue No. 301 or visit us at our Brantford works and see the Roller being build and tested—a practical demonstration that is its best selling argument.

The Waterous Engine Works Co., Limited
Brantford - Canada

STEEL AND RADIATION LIMITED

Sheets
cut in large range
of sizes and
areas

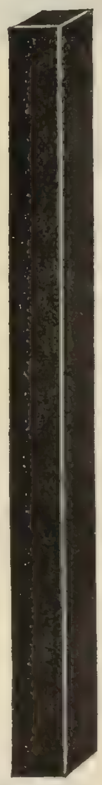
"Steelcrete"

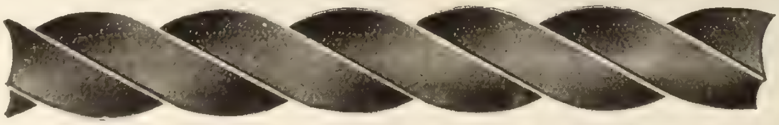
IS the ideal reinforcement for all classes of Concrete construction, can be successfully laid by unskilled labor and thus reduce your labor costs. Manufactured from open-hearth steel plates by automatic machines which slit and open the meshes simultaneously from the cold sheet, thus increasing the elastic limit and ultimate strength. No "straightening out" ensues when load is applied to split the concrete before reinforcement comes into tension.

Bar Reinforcements

¶ We make a specialty of concrete beam reinforcement and can supply rods and bars up to 66 feet in length fabricated ready for placing in beams, thus saving your time and money.

Plain Round


Plain Square



STEEL AND RADIATION LIMITED

SHOW ROOMS MONTREAL, 138 Craig St. W.
TORONTO, 92 King St. W. and
80 Adelaide St. E.

Head Office
TORONTO, ONTARIO

Stocks and Agencies in All Leading Cities

TENTS

for Engineers and Contractors

We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

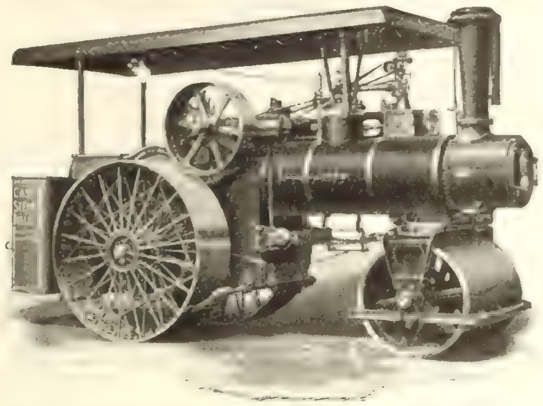
We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

Woods Limited

Woods Building - Ottawa, Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT

THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18″ x 26″ cylinder Mogul, Standard Gauge, and 18-10″ x 14″ Vulcan and Davenport dinkeys, 36″ Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36″ Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8″ Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag Scrapers and 1—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 18-36″ Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW

May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED

St. James St. & Dolland Lane - - MONTREAL, CANADA

Sand and Gravel

Lime
Cement
Plaster
Hair
Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North {604 605 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C.P.R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

RECIPROCITY

means to exchange. We have high quality fittings, you have good money. Lets get together.

S BRAND

Cast Iron Fittings and Valves are Right

"Everlasting" Blow-off Valve
SIMPLE — DURABLE — EFFICIENT

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced Concrete Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

PROVED!

that a

Glenboig Furnace Saves Fuel

Because it can be more quickly heated up. The heat is better retained and more efficiently utilized owing to the non-corrosing character of the fabric.

GLENBOIG

Every Glenboig Brick bears the brand

GARTCOSH

No Melting. No Cracking and Splitting Off. High Reflective Power.

Send for further particulars.

SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The

Missisquoi Marble Company

Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd. - -	Toronto, Ont.
C. N. Barclay - -	Winnipeg Man.
Bosse & Banks - -	Quebec, Que.
General Contractors Supply Company, Ltd. -	Halifax, N. S.
129 Sparks Street - -	Ottawa, Ont.
James Robertson Co. Ltd. -	St. John, N. B.
G. R. Duncan - -	Fort William, Ont.
Walker & Barnes - -	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd. -	Vancouver, B. C.
315 Coristine Building -	Montreal, Que.

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries Write for prices

L. A. Delaplante Limited

Head Office (Manning Arcade)
24 King St. W. Phone Main 5912 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Come to Us If You Need

- Hardwood Flooring
- Interior Trim
- Veneer Doors
- Pine Doors
- Stairs Frames
- Sash, etc.

We Manufacture the Above from Select Stock

J. R. Eaton & Sons

Limited

Orillia, Ontario

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos
263 Armstrong Ave., Jersey City, N. J., U. S. A.

Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

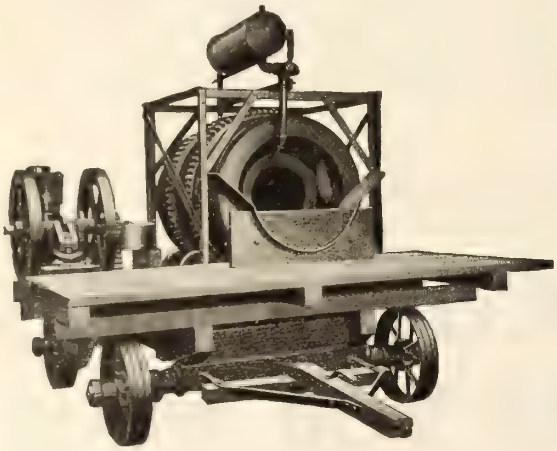
Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

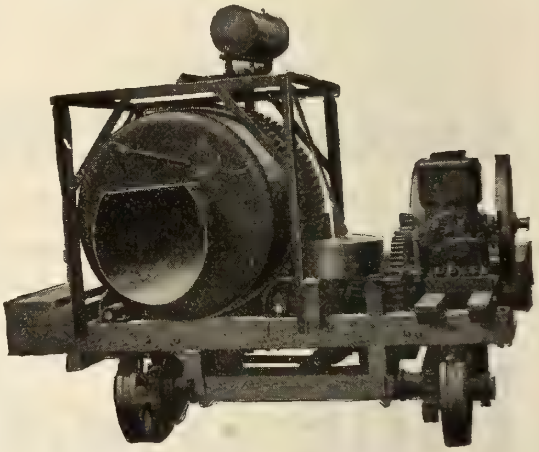
The Low Charging **CROPP MIXER**

The only Mixer that will not spill when overcharged

Low charge and high discharge covered by Patent 947196.



Either Steam or Gasoline Engine



Our Prices will Interest You

The only mixer having batch constantly in sight of operator.

Cropp Concrete Machinery Co., 84 Lasalle Street, Chicago, Ill., U. S. A

Nos. 109-11-13 West 18th Street, Kansas City, Mo. MANNAN SMITH SUPPLY CO., St. Joseph Mo.
We carry machines in stock at Kansas City and St. Joseph, and can make immediate deliveries

THE
Thames Quarry Co.
St. Mary's, Ont.

CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

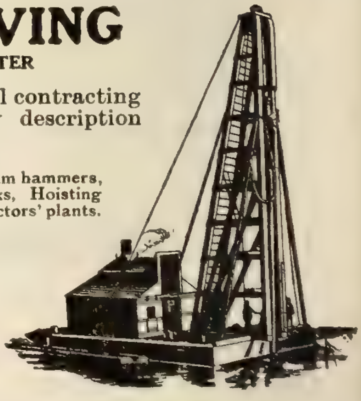
JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.



Contractors Please Note

For the building of such reinforced concrete work as floors, roofs, culverts, archways, sewers, tunnels, and other construction of similar character, no reinforcing is superior to

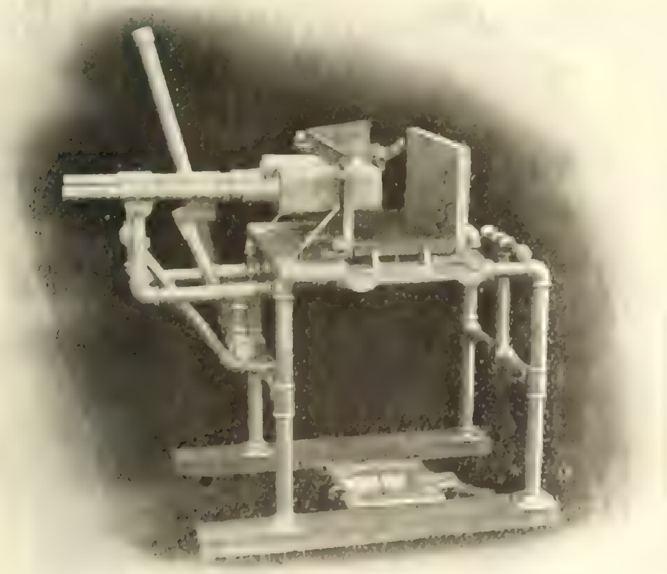
Greening's Wire Reinforcing

It is a woven mesh of hard drawn, double crimped steel wire made in any desired length or strength. It has proved eminently successful where ever it has been applied. Our big output of this and other wire goods enables us to quote the lowest prices obtainable, quality considered, and to assure you of prompt delivery of all orders. Let us give you our estimate.

Write us for Catalogue No. 5

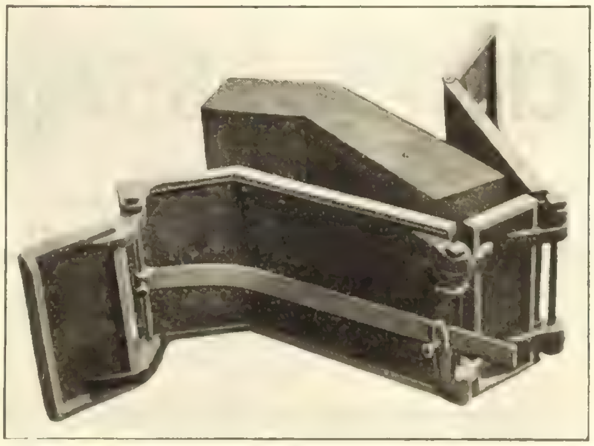
The B. Greening Wire Company Ltd.

Hamilton, Ont. Montreal Que.



Block Machine No. I. (End Door Removed)

This machine is strong, simple, and what is more important it is the fastest outfit on the market, and you know time means money.



Famous Angle Mould

This mould will make blocks with any angle from 20 to 60 degrees in 8 or 9 inch height without having to change any parts other than for adjustment. A great many of these moulds have been sold.

Send for our Literature

Famous Machinery Co., 21 Pitt Street W.
WINDSOR, ONT.

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited

Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

—Bridge and Construction Dep't.—

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS SUPPLIES

WATER WASHED SAND

OUR SPECIALTY

Dealers in
Sand and Gravel
Crushed Granite
Crushed Stone

SAND
&
SUPPLIES, LTD.
TORONTO

The
Phœnix Bridge & Iron Works Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

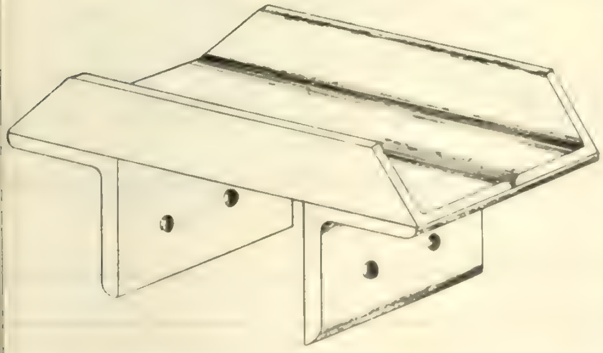
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

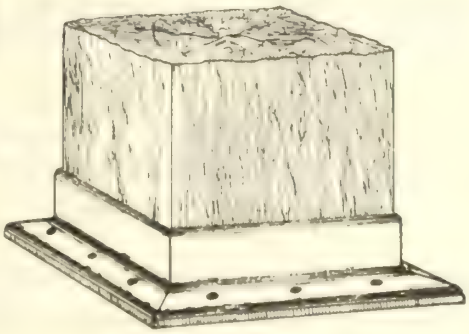
Wm. McNally & Co. - Montreal

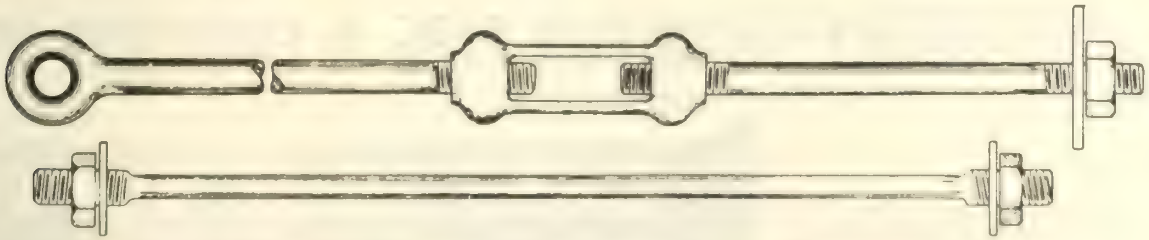
The Hamilton Bridge Works Company Limited

Hamilton, Canada



STEEL POST CAPS
and BASES
for Wooden Posts,
any size.
Also made in
Cast Iron





EYEBOLTS, TURNBUCKLES and RODS of all descriptions

Beams, Angles, Channels, Plates, any size from 1½ inch to 24 inches, and any length up to 70 feet

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President. J. G. Allan Vice-President. James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

PROMPT DELIVERIES

Fellowes and Fellowes
59 Yonge Street., TORONTO
Engineers' and Contractors' Machinery

Steel Dump Cars, Hoisting Engines, Derricks Pumps, new and second hand Rails and Cars, Turntables, Clam Shell and Orange Peel Buckets, etc. Contractors' Elevating and Conveying Machinery.

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERSIN CANADA OF

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments **Works and Offices: Ashbridge's Bay, TORONTO**

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power
Civil Engineers
TORONTO WINNIPEG
Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN
CONSULTING ENGINEERS
STEAM, ELECTRIC AND HYDRAULIC POWER
43 KING ST. WEST - TORONTO

T. Harry Mace
ENGINEER
Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete
630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.
Bowman & Connor
Consulting Municipal and Structural Engineers
Waterworks, Sewerage and Electric Plants
Concrete and Steel Bridges and Buildings
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae
Consulting Engineer
Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON
ENGINEERS
Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.
405 Dorchester Street East, MONTREAL

John. T. Farmer
MECHANICAL AND HYDRAULIC ENGINEER
427 Coristine Bldg., Montreal

EDW. O. FUCE
Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor
CIVIL ENGINEER
GALT - ONTARIO
Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell
Consulting and Supervising Engineers
Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants
Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.
A.M. Can. Soc. C.E. A.M. Am. Soc. C.E.
Consulting Civil and Municipal Engineer
SPECIALTIES
Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.
315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C.E.
Consulting Engineer
Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work
1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY
Mem. Can. Soc. C.E.
Civil and Hydraulic Engineer
Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.
Suite 413, Pacific Block, Vancouver, B. C.

JOSEPH N. ROULEAU
Submarine Diver
Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.
793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.
Consulting, Civil and Sanitary Engineers
General Municipal Engineering
Specialties: { Waterworks, Sewerage and Electric Lighting.
Toronto and Winnipeg
John Galt John Haddin

Allan Keefer
Architect
Ottawa, Ontario

Arthur L. Weeks
Architect
Canada Life Building, Ottawa
Reinforced concrete and steel structures, factories and commercial buildings

NADEL & ADLER
375 St. James St., MONTREAL
The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Jas. A. McIlwraith
General Contractor
For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.
COLLINGWOOD, ONT.

TRADE MARK TAMCO
FOR SALE
"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.
Limited
MANUFACTURERS OF
Building Granite, Granite Setts, Curbing, Etc.
Samples Furnished and Prices Quoted on Application
Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.
Bank of Ottawa Bld'g. 224 St. James St. Montreal
Bell Tel. M. 4354

Rails for Contractors, Switches, Girders, etc. New and Second Hand.
Locomotives and Cars
JOHN J. GARTSHORE
58 Front Street W., TORONTO

Current Prices of Building Material.

BRICKS.

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS.

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 80 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.85	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	...	15.00
91 to 95 "	...	17.50

Brass Goods, Valves, etc.

96 to 100 "	...	20.50
101 to 105 "	...	24.00
106 to 110 "	...	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u. i.	$4.00	$3.00	$ 6.75	$ 5.25
40 u. i.	4.25	3.50	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	...	...	14.00	10.50
90 u. i.	...	...	16.50	11.50
95 u. i.	...	...	18.00	13.50
100 u. i.	...	...	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES.

(Installed in Toronto.)

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—⅛-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 inch; colors, buff, grey, granite, red granite, 55 cents per square foot.

Vitreous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard, size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES.

ndard compression work, 65 per cent.

h grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus.

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range.

30 gallon, standard, $4.50; extra heavy, $7.00

Cast Iron Sinks.

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe.

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 1¼ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Chumshed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and beads, in the rough, delivered, 40 cents per foot.

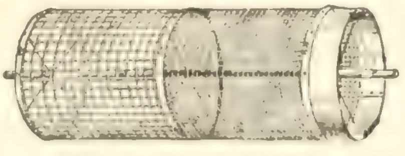
PAINTS AND OILS.

(Wholesale Prices at Toronto.)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

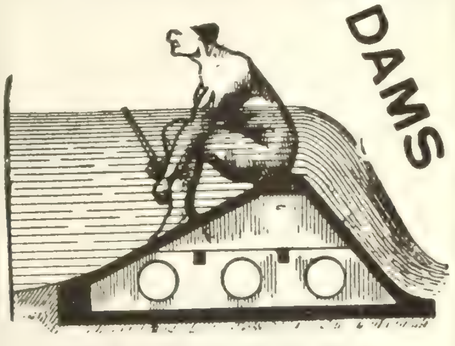
Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

We manufacture
Revolving Screens

and anything in the screen line.
Also railings, wire guards, grills etc.
Electro-plating and all metal finishes.
Estimates Given - Send for Catalogue
Crescent Wire & Iron Works
Partridge & Sons KINGSTON

Bonds of Suretyship for Officers and Employees in positions of trust.
Bonds Bid and Supply in lieu of Certified Cheques when necessary in Tendering or Contracting for the Furnishing of Supplies.
The
Guarantee Company of North America
The Pioneer Company [illegible]
Head Office - Montreal
Capital and Resources over $1,965,000
Claims Paid over - - - $2,265,000
[illegible]
This Company is not a party to any premium tariff combination.

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager. Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Charles Street, Stratford, Ontario. Showing "Tarvia Modern Pavement."

Adding to the Life of Macadam

Ordinary macadam belongs to the past. It is not adequate to meet the demands of modern automobile traffic.

It must be discarded or ***tarviated.***

A tarviated road costs a little more than ordinary macadam but lasts so much longer that the addition of the Tarvia is more than paid for in the reduction of maintenance.

Tarvia makes a firm elastic matrix around the stone, filling all voids, excluding water, and resisting pulverization of the surface.

For an old road that cannot be rebuilt or resurfaced, the "sprinkling" or "surface" treatment known as "Tarvia B" treatment is highly effective. One treatment will give excellent results for a season, or even longer, depending upon the amount of traffic. This treatment is quite inexpensive.

Tarvia gets at the original causes of road waste and disintegration. Oils and other devices simply make the dust too heavy to rise. They have little or no bonding or preservative properties.

Tarvia is made in three grades:—

Tarvia X, for road construction.

Tarvia A, for use in surfacing old roads and keeping them dustless.

Tarvia B, for dust suppression on old roads.

Road Engineers, road authorities, automobile owners and residents along macadam roads are invited to send for our booklet.

Address nearest office.

The Paterson Manufacturing Co. Limited
Montreal Toronto Winnipeg Vancouver
The Carritte-Paterson Manufacturing Co., Limited
St. Johns, N. B. - Halifax, N. S.

FLOOD YOUR BUILDING WITH LIGHT

BY INSTALLING

LUXFER PRISMS

The illustration shows the transom of a store made of Luxfer Prisms, and the interior effect is nothing short of wonderful.

The canopy was also designed and erected by us.

Yes, there are dozens of buildings without our Prisms, but they are also without daylight.

The only way to get daylight properly distributed through any building or store (unless it is in the middle of a ten acre lot) is by the use of LUXFER PRISMS.

Advise us of your requirements and let us tell you what LUXFER PRISMS can do for you.

We can **demonstrate** every claim we make.

Luxfer Prism Co.,
Limited
100 King Street West, Toronto

Stop Your Building Until You've Decided on the Gas Question

If you are building and have made no provision for gas piping, you are making a grave mistake. You not only affect your own interests, but do an injustice to your client **Modern Gas Lighting and Appliances** hold a place in the world's progress that must not be overlooked. Your client wants the best that's going. He looks to you for the information. If you are the owner you certainly require the ideal when it comes to home comforts. If you build for renting purposes—you naturally wish to keep good tenants. Good tenants are like customers—give them good service and they stay. In Toronto nearly 70,000 homes and buildings are piped for gas light and fuel — 80% more than with all other systems combined. In Toronto, gas piped buildings are increasing at the rate of 7,000 per year. Why is it? It's because people realize that "GAS" cannot be equalled when it comes right down to quality and actual figures.

?

Modern Gas is a wonder. **Modern Gas Appliances** have revolutionized the gas business. We want you to consult with us now. We want you to see the "**new things**" before that building grows bigger. We want you to come right down to see the appliances demonstrated. Come in and see the beautiful fixtures, domes, chandeliers, fuel appliances, ranges, water heaters, and hundreds of other useful articles that make a home brighter and labor lighter. Won't you sit down right now and drop us a card; or better still — call and see us. Consultations free.

The Consumers' Gas Company, of Toronto

12 and 14 Adelaide St. West.
TELEPHONE
Main 1933
Head Office, 19 Toronto St.

Gas Consumers Increasing in Toronto at the Rate of 20 Per Day.

"HUBER" ROAD ROLLERS

for all kinds of contract work for plowing and for hauling

Built for the Contractor, and peculiarly adapted to his work. Makes the Contractor independent of animal power, and greatly reduces the number of men on the pay-roll.

Runs backward or forward equally well. Finest power for pulling stone or dirt wagons; and hauls them in trains easily. Hitch it to the largest graders, and it pulls them right along without trouble.

☞ When it comes to pulling rooter ploughs, there is nothing better. The hardest kind of a street or road is easy work for this engine, if you can get a plow strong enough to stand up to the work.

Outfit is guided by power steering attachment. Nothing finer could be devised. Just a light touch of the hand on steering lever is all that is required. The engine furnishes the power to steer itself.

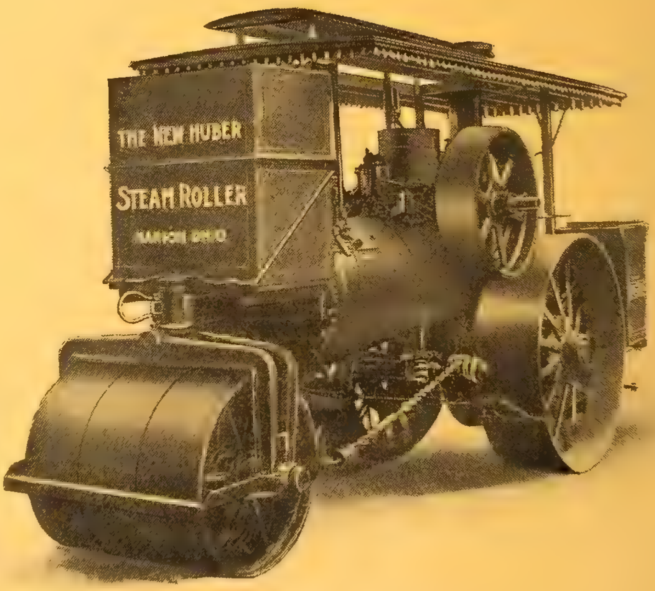
Our twin cylinder machine runs the smoothest of any traction engine built. Details and specifications are given in our special catalog for Contractors' sent on request.

Supplied with Single or Double Cylinders

10 and 14 ton sizes

Let us submit proposal.

We can now offer a special outfit which we call the Contractor Engine. Not only was a Traction Engine required but the contractor must also have a road roller. These machines are costly? Why buy two, an engine and a roller? Why not build two in one? This we have done, and we are able to offer a high-class traction engine and road roller in one outfit, and at but little more than what either alone would cost of any other style.



F. H. Hopkins & Co.

MONTREAL

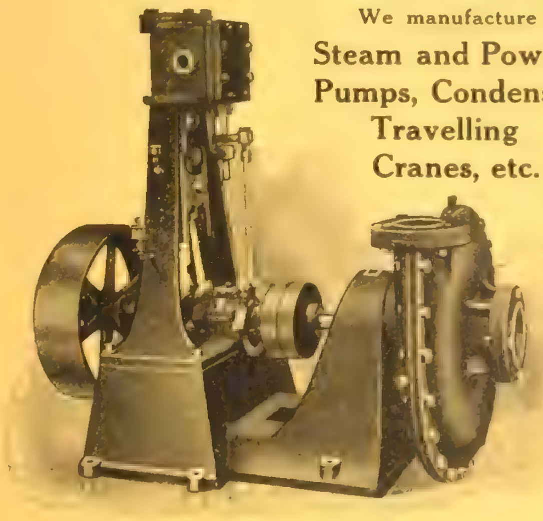
Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.

Vol. 25 Toronto, June 14, 1911 No. 24

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information



We manufacture
Steam and Power
Pumps, Condensers,
Travelling
Cranes, etc.

Write for Catalogue

The Smart-Turner Machine Company
HAMILTON, ONTARIO Limited

"MADE IN CANADA"

Bent Glass

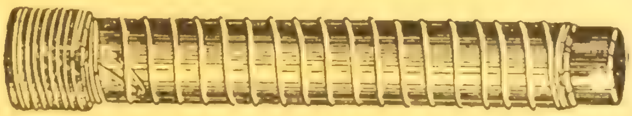
Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

High Speed
Portable
COMPRESSORS
Page 28

Canadian RAND Co., Ltd.
Commercial Union Bldg., Montreal, Can.



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS

for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

---

SO SIMPLE

is the Construction of the

"American" Hoisting Engine

That Inexperienced Men Can Operate It

SO RIGID

is It That If They Do Blunder No Damage Occurs

A contractor in Illinois writes us that he was compelled at two different times to take two of his men (mortar mixers) and put them to operating his hoisting engine.

He says:

> That speaks volumes for the simple, rigid construction of the "American" Engine."

American Hoist & Derrick Co., St. Paul, Minn.

Authorized Agents: Gorman, Clancey & Grindley, Edmonton and Calgary, Alta. and Nelson, B.C. Vancouver Machinery Depot, Ltd., Vancouver, B.C. J. L. Neilson & Co., Winnipeg, Man. Dunn Brothers, Winnipeg, Man. J. A. McTaggert, Winnipeg, Man.

Name

Address

Please send prices and information on "AMERICAN," State whether Engines, Derricks, etc.

AMERICAN HOIST & DERRICK CO.
St. Paul, Minn.

C. R

When making specifiactions keep these facts in mind about Canada Cement

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

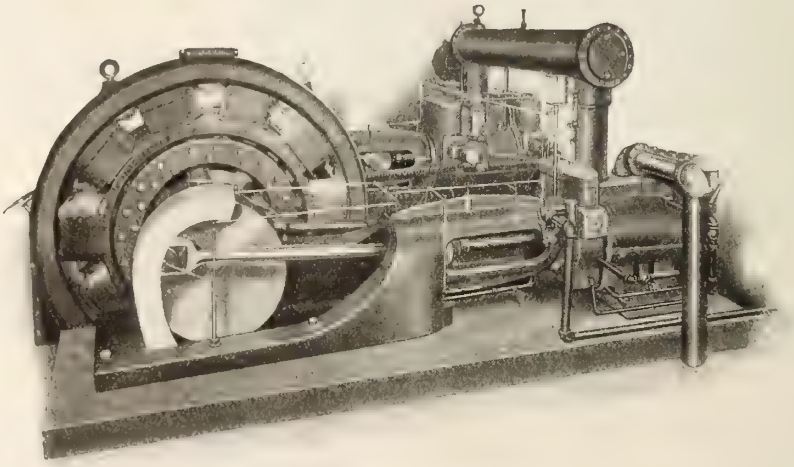
Remember

We guarantee **uniformity of strength, setting qualities, color,** and **fineness of grinding,** which must obtain if Concrete construction is to prove successful.

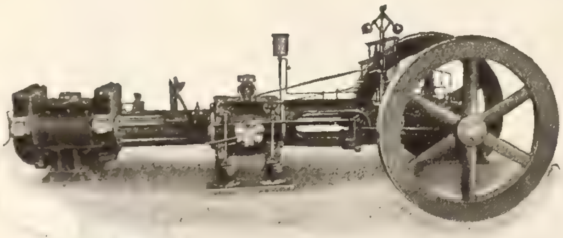
Canada Cement Company, Ltd.

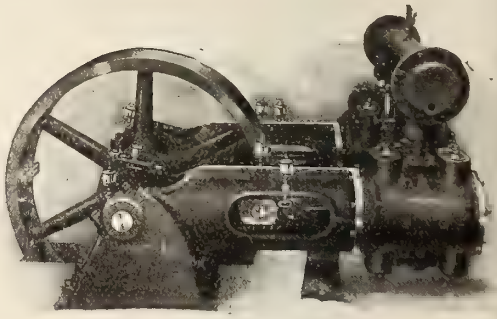
MONTREAL - TORONTO - WINNIPEG - CALGARY

Air Compressors
for Every Service



Laidlaw-Dunn-Gordon with Patent Cincinnati Air Valve





Tell us your requirements and we will make a proposition

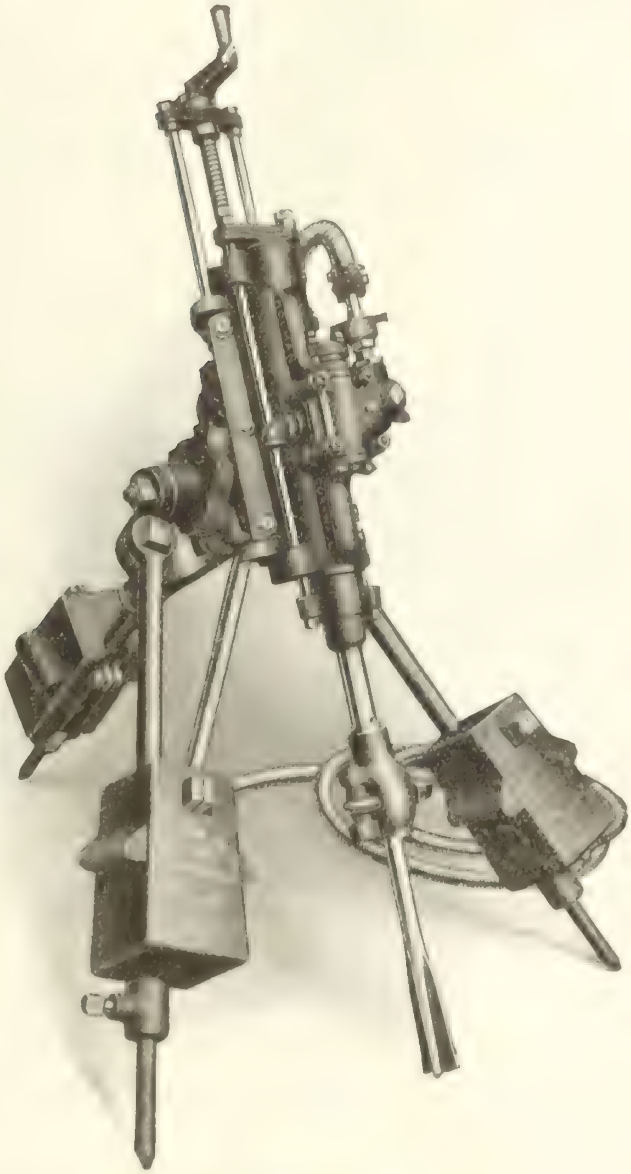
Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

HOLMAN ROCK DRILLS

ow making
ecords never
ualled.

sizes carried
stock with full
sortment of
plicate Parts.



Guaranteed to Drill an increased Footage at a Lower Cost for Air and Repairs than any other Drill of equal size.

Ask for Catalogue No. 39

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects

	Page
Keele, Victor	88
Weeks, Arthur I	88

Architectural Iron Work

Canada Wire Goods Mfg. Co	70
Dennis Wire & Iron Works	77
Meadows Co., Geo. B	35

Air Compressors

Escher Wyss & Co	67

Air Valves, Automatic

Marsh, J. P.	80

Asphalt Plant

East Iron Machine Co.	73

Buckets

American Hoist & Derrick Co.	2
Sackett Screen & Shute Co	

Belting

Federal Engineering & Supplies, Ltd	72

Blowers

Sturtevant Co., B. F.	70

Boilers

Case Threshing Machine Co.	79
Inglis, John	65
Jenckes Machine Co.	2
Leonard & Sons, E	73
Marsh & Henthorn	68
McDougall Caledonian Iron Works	67
Mussens Limited	4
Waterous Engine Works Co.	77

Brick Machinery and Supplies

Berg Mfg. Co.	14
Peerless Brick Machine Co.	
Wert C. S.	27
Whitehead, John	

Brick

American Enamelled Brick Co.	71
Don Valley Brick Works	7
Hamilton Pressed Brick Co	71
Milton Pressed Brick Co	
Port Credit Pressed Brick Co.	86
Toronto Pressed Brick Co.	

Brickmaker's Supplies

Sackett Screen & Shute Co	

Bridges (Steel)

Attica Bridge Co.	91
Canadian Bridge Co	84
Cleveland Bridge Co.	84
Dickson Bridge Works	
Dominion Bridge Co	84
Hunter Bridge and Boiler Works	30
Phoenix Bridge and Iron Works	85
Pennsylvania Steel Co.	84

Cement

Alsen Portland Cement Co	74
Britnell & Co	80
Bremner, Alex	87
Canada Cement Co	3
McNally & Co., W.	85
Morrison & Co., T.A.	88
Rogers, Alfred Limited	9

Concrete Pipe

Dominion Concrete Co.	22
Lock Joint Pipe Co.	

Cement Waterproofing

Ceresit Waterproofing Co.	35
Hercules Waterproofing Cement Co	29
Mansbendel, F. P	31

Cranes, Travelling & Locomotive

	Page
American Hoist & Derrick Co.	2
Armstrong, H. J.	70
Brown Hoisting Machinery Co.	77
Males Co	62
Willis Shaw Machinery Co	62

Conduits

Conduits Co., Limited	87

Crushed Stone and Granite

Sand and Supplies	85

Concrete Mixers and Machinery

Canada Foundry Co	20
Cropp Concrete Machinery Co.	82
Famous Block Machine Co.	
General Machinery Co.	70
Gould, Shapley & Muir	16
Hopkins & Co., F., H	92
Jenckes Machine Co	2
London Concrete Machinery Co.	35
Milwaukee Mixer Co.	16
Mussens Limited	4
Morrison & Co., T. A	88
Steel and Radiation (Cement Gun)	78
Vining Bros.	
Wettlaufer Bros.	10

Contractors' Plant

American Hoist & Derrick Co.	2
Acme Eqpt. & Engineering Co.	75
Beatty & Sons, M.	6
Hepburn, John T	12
H. & E. Lifting Jack Co	72
Hopkins & Co., F.H	92
International Marine Signal Co.	8
Willis Shaw Machinery Co.	62
Meaford Wheelbarrow Co.	
Marsh & Henthorn	68
Montreal Locomotive Works	33
Mussens Limited	4
Ritchie Contractors Supply Co.	91
Tiffin Wagon Co.	30
Troy Wagon Works	70

Crushers (Stone and Rock)

Berg Machinery Co	14
Case Threshing Machine Co.	79
Hopkins & Co., F. H.	92
Jenckes Machine Co	2
London Concrete Machinery Co.	33
Males Co	62
Mussens Limited	4
Morrison & Co., T. A	88
Willis Shaw Machinery Co	62

Corrugated Iron

Galt Art Metal Co	
Metallic Roofing Co	69
Metal Shingle and Siding Co	76
Ormsby, A. B., Limited	11
Roofers Supply Co	87

Contractors

Bennett, Robt.	76
Foundation Co	89
Holmes, Fred.	76
McIlwraith, Jas. A	88
Nadel & Adler	88
Wells & Gray	32

Coal Handling Apparatus

American Hoist & Derrick Co.	2
Down Draft Furnace Co.	75

Derricks and Derrick Fittings

American Hoist & Derrick Co.	2

Drills

Beatty & Sons M	6
Canadian Rand Co	28

Drilling Contractors

	Page
Harvey, J	89

Dredges

Beatty & Sons, M	6
Males Co	62
Willis Shaw Machinery Co	62

Dry Kilns

Sturtevant Co., B. F.	70

Electrical Apparatus, Motors

Canada Ford Co.	

Engines

Case Threshing Machine Co.	79
Canadian Boving Co.	
Inglis, John	65
Jenckes Machine Co	2
Leonard & Sons, E	73
Mussens Limited	4
Sturtevant Co., B. F.	70
Waterous Engine Works Co	77

Engineers (Civil) and Mechanical

Barber & Young	88
Chipman & Power	88
Bowman & Connor	88
Farmer, John T	88
Fuce, Edw. O.	88
Galt Engineering Co., John	88
Glaubitz, H. J	88
Hancock, H. Syd.	88
Inglis, John	65
Kennedy, Jas. C.	88
Lea & Ferguson	88
Mace, T. Harry	88
Mitchell, C. H	88
McRae, John B	88
Moore & Scollan	88
Taylor, James	88

Exhaust Heads

Sturtevant Co., B. F.	70

Filters

American Water Softener Co.	

Floor Scrapers

Hurley Machine Co	30

Friction Clutches

Berg Machinery Co	14

Field Instruments

Gurley, W. & L. E.	68

Fire Brick

Gibb, Alexander	81

Fire Apparatus

Morrison & Co T. A	88
Seagrave, W E	80

Fireproof Doors and Windows

Douglas Bros	18
Mussens Limited	4
Ormsby, A. B.	11
Steel and Radiation	78

Gauges, Steam, etc.

Marsh, Jas. P	80

Granite and Marble

Laurentian Granite Co	83
Missisquoi Marble Co	81
Smith Marble & Construction Co.	

Glass

	Page
Consolidated Plate Glass Co.	
Luxfer Prism Co	
Toronto Plate Glass Importing Co.	1

Heating Apparatus

Jenckes Machine Co.	2
Leonard & Sons, E	73
Steel and Radiation	78

Hoisting Machinery

American Hoist & Derrick Co.	2
Beatty & Sons, M	6
Canada Ford Co.	
Inglis, John	65
Jenckes Machine Co	2
Hopkins & Co., F. H	92
London Gas Power Co	73
Marsh & Henthorn	68
Mussens Limited	4
Sturtevant Co., B F	70

High Pressure Pipe Lines

Escher Wyss & Co	67

Hydrants

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co	86
Kerr Engine Co	

Interior Finish and Doors

Anglin, S.	74
Brennen & Sons, M	
Batts Limited	17
Canada Office & School Furniture Co	
DeLaplante, Ltd.	81
Bryan Mfg. Co.	67
Eaton & Sons, J. R.	81
Georgian Bay Shook Mills	34
Rhodes Curry & Co.	
Tillson Co.	19
Wilson Bros.	

Locomotives

Montreal Locomotive Works	33

Lime

Christie, Henderson & Co.	80
Jamieson Lime Co	
Standard White Lime Co	75

Metal Lath

Galt Art Metal	
Metallic Roofing Co	69
Noble C. W.	74
Steel and Radiation	78

Meters

Hopkins & Co., F. H.	92
McDougall Caledonian Iron Works	67
Neptune Meter Co	71

Paving and Paving Materials

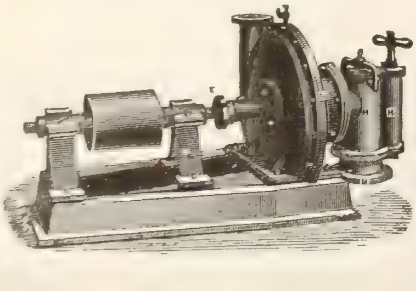
Dominion Carbolineum Works	
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	74
Shawmut Paving Brick Co.	
Silica Barytic Stone Co. of Ontario	83

(Continued on page 10)

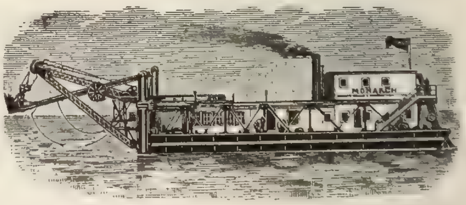
M. Beatty & Sons, Limited
Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

SIMPLE PERFECT

CLEAN WATER

For MANUFACTURERS or MUNICIPALITIES

Can be obtained by using the

"TORRENT" or "PULSOMETER"

FILTER

Complete information furnished on request

International Marine Signal Company Limited

OTTAWA, CANADA

GRAVITY PRESSURE

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Page
Albert Mfg. Co.	13
[illegible] & Co	8[illegible]
[illegible], H. W	86

Pipe

American Spiral Pipe Works	78
Canadian Pipe Co.	86
Dominion Wood Pipe Co	12
[illegible] Concrete Co	23
Gartshore-Thomson Pipe Co.	86
Lock Joint Pipe Co	
[illegible] & Co	11
National Iron Works	87
Pacific Coast Pipe Co.	1
Pedlar People	26
Steel and Radiation	78

Plumbers' Supplies

Standard Ideal Co	[illegible]

Power Engines

Inglis Co., John	65

Paints and Varnishes

Paterson Mfg. Co	90

Pile Driving Machinery

American Hoist & Derrick Co.	2
[illegible] Construction Co.	82

Pumps and Pumping Machinery

American Well Works	
Beatty & Sons, M	6
Cook, A. D.	
Escher Wyss & Co.	67
Hopkins & Co., F. H.	92
Inglis Co., John	65
Leonard & Sons, E	73
McDougall Caledonian Iron Works	67
Mussens Limited	4
Ontario Wind Engine & Pump Co.	82
Smart Turner Machine Co.	1
Waterous Engine Works Co	77

Roofing Contractors

Schwoerer & Sons, A.	

Roofing Materials

	Page
Asbestos Mfg. Co.	24
Galt Art Metal Co.	
Metallic Roofing Co.	69
Metal Shingle & Siding Co.	76
Noble, Clarence W	74
Paterson Mfg. Co.	90
Philip Carey Co	76
Roofers Supply Co	87
Standard Paint Co.	

Railway Supplies

Gartshore, John J.	88
Hopkins & Co., F. H.	92
Mussens Limited	4

Reinforcements. Concrete and Steel

Ambursen Hydraulic Construct'n Co.	83
Canada Wire Goods Mfg. Co.	70
Concrete Form Engine Co.	69
Steel Co. of Canada	19
Steel & Radiation	78
Trussed Concrete Steel Co	34
Turner, C. A. P.	

Road Machinery

Case Threshing Machine Co.	79
Hamilton Machinery Co.	15
Morrison & Co., T. A	88
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M	6
Canada Foundry Co	20
Hopkins & Co., F. H	92
Mussens Limited	4
Males Co	62
Willis Shaw Machinery Co	62

Stone

Anderson, Geo	18
Britnell & Co.	80
Brodie, Jas.	
Christie, Henderson & Co.	80
Consolidated Stone Co.	
Contractors' Supply Co	80
Corinthian Stone Co	25
Crushed Stone, Limited	73
Doolittle & Wilcox	68
Hagersville Contracting Co.	11
Laurentian Granite Co	83
McMillan & Son, R	72
Morrison & Co., T. A	88

Stone

	Page
Myers, Oakley	73
Roman Stone Co	13
Sackville Freestone Co.	8
Sand & Supplies	85
Thames Quarry Co.	82

Sand and Gravel

Rogers Supply Co	31
Sand & Supplies	85

Steam Apparatus

Sturtevant Co., B. F.	70

Submarine Diver

Rouleau, Joseph N.	88

Structural Iron and Steel

Buffalo Steel Co.	72
Dominion Bridge Co	84
Steel Co. of Canada	19
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	83
Salter, W. H.	85
Steel & Radiation	78

Sewer Pipe

Britnell & Co	80
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
GartshoreThomson Pipe Co.	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	
National Iron Works	87
Ontario Sewer Pipe Co.	21
Standard Drain Pipe Co.	21

Stationary and Power Engines

Case Threshing Machine Co	79

Slate

Roofers Supply Co.	87

Steel Shingles and Ceilings

Galt Art Metal Co.	

Smoke Stacks

Leonard & Son, E.	73

Tents

Woods Limited	79

Safes and Vaults

Taylor, J & J	70

Testing and Inspection Bureau

	Page
Hunt & Co., Robt. W	73

Tiles

Smith Marble & Construction Co.,	

Tanks and Stand Pipes

Berg Machinery Co	14
Inglis, John	65
Jenckes Machine Co	2
Leonard & Sons, E.	73
Marsh & Henthorn	68
McDougall Caledonian Iron Works	67
Ontario Wind Engine & Pump Co.	82

Trade Journals

Castellanos A. W.	82

Valves

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co	86
Kerr Engine Co.	
Marsh & Co. Jas	80
Standard Fitting & Valve Co	80

Ventilating and Heating Apparatus

Gardiner & Gaskill	77
Sturtevant Co., B. F.	70

Water Softeners and Filters

Berg Machinery Co	14
American Water Softener	

Wire Rope

Greening Wire Co., B.	
Smith, Thos. & Wm.	23
Steel Co. of Canada	19

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	70
Crescent Wire Iron Works	
Sackett Screen & Shute Co	
Steel and Radiation	78

Water Wheels

McDougall Caledonian Iron Works	67
Canadian Boving Co.	

Water Turbines

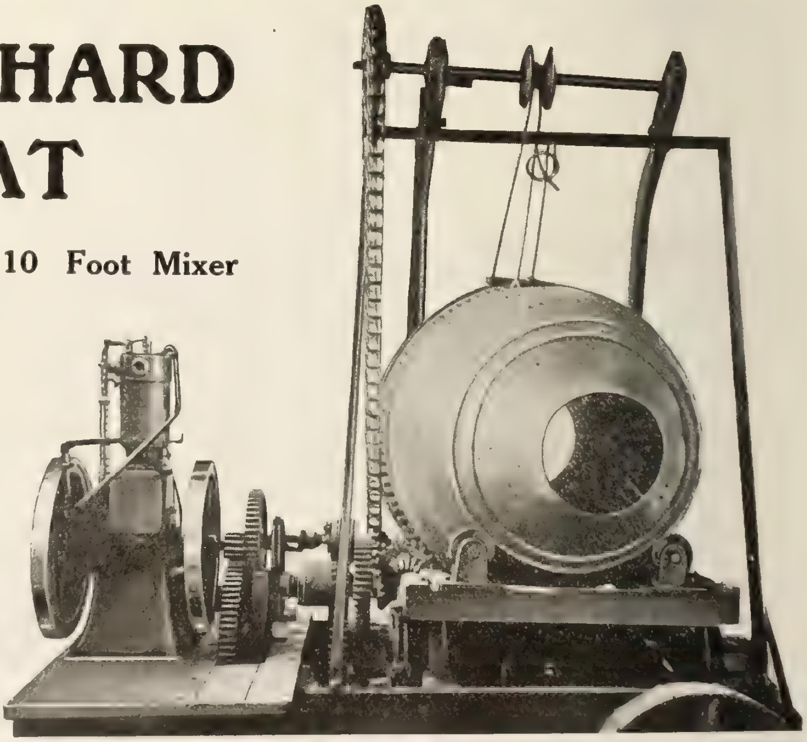
Escher Wyss & Co	67

Wheelbarrows

Sackett Screen & Shute Co.	

A MIXER HARD TO BEAT

New Improved Heart-Shaped 10 Foot Mixer



This Mixer is built especially for sidewalk and construction work. It is equipped with the new watering system—a very necessary addition on sidewalk construction. This Mixer is built about 1500 lbs. lighter than our half yard Mixer. Any kind of power may be used.

Send for our Illustrated Catalogue Concrete Mixers and Machinery

WETTLAUFER BROS. 178 Spadina Ave. Toronto

A. R. Williams Machinery Co., 15 Dock St., St. John, N.B. W. E. Ransome, Moosejaw, Sask.

MODERN.

→ ESTABLISHED 1861. ←

MUNDERLOH & CO. LTD.

Sole Agents in Canada for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS

AN IMPROVEMENT ON CAST IRON MAINS.

51 VICTORIA SQUARE,

MONTREAL.

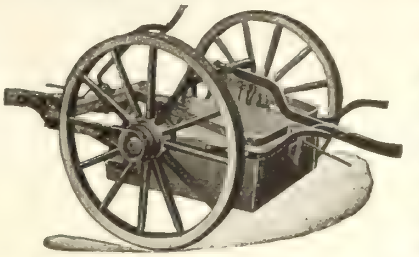
MADE UP TO 40 FEET IN LENGTH.

STRONGER.

CHEAPER.

RELIABLE

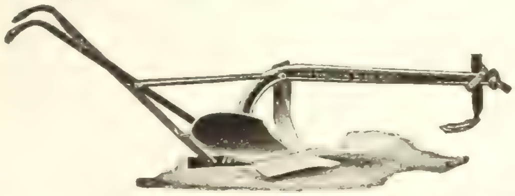
Scrapers and Grading Plows



Backed by a Reputation

Ask any contractor of large experience. He will tell you that for over a quarter of a century there has been maintained a reputation for largest capacity and greatest durability for the

"Western" Line of Wheeled and Drag Scrapers and Grading Plows



The reason is a life-time's experience in actual contract work **combined with** an extensive manufacturing experience and every machine has been perfected after years of the most rigid tests.

Western Wheeled Scrapers, the pioneers and most extensively used characterized by square-shaped pans bent cold, general sturdy construction and many patented exclusive features. Built in any size.

Western Drag Scrapers, Chicago Tongue and Western Buck Scrapers.

Western Railroad and **Township Plows,** designed for hardest service and proved by many years of use. Any size from 2 to 16 horse power.

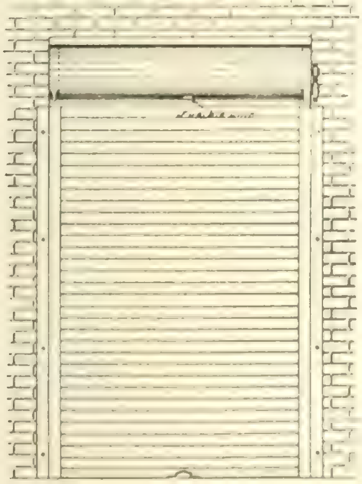
Get our complete catalogue of earth and stone handling machinery.

Western Wheeled Scraper Co.

AURORA, ILL.

A Really Fireproof Rolling Steel Door

is our patented Rolling Steel Door. This was demonstrated in Geo. H. Hees Son & Co., Ltd., Fire in Toronto. They have our Rolling Steel Doors on their Freight Elevator Shaft. Their Fire started on the top flat. They say of it—"**The Rolling Steel Door** in the rear elevator shaft **withstood the flames** without bulging, warping or getting out of position and kept the flames from travelling down the elevator shaft." Specify our patented **Rolling Steel Door.** It has everything in its favor.



Experts in Fireproof Windows and Doors

A. B. Ormsby, Limited

Factories { Corner Queen & George Streets - TORONTO
677-81 Notre Dame Avenue W., WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.

Limited

Hagersville - Ont.

WOOD STAVE PIPE

Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.

Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Have you any use for a Derrick?

There are large plans under way. Large contracts are being placed. In all directions there is bustle and activity. Everything points to an unusually busy season for construction work of all kinds. But what about equipment?

John T. Hepburn

Scotch Derricks

are in use by all leading contractors in all parts of the country. They are designed and built for hard work, combining safety and high efficiency, with low operating cost. Being made in standard sizes, any part can be replaced at short notice. They may be operated by hand or power—are fitted with single and double purchase gears—powerful band brake—and safety locking device that prevents boom from falling.

We are busy now. We shall be busier in two or three weeks
Better place your order to-day to secure early delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

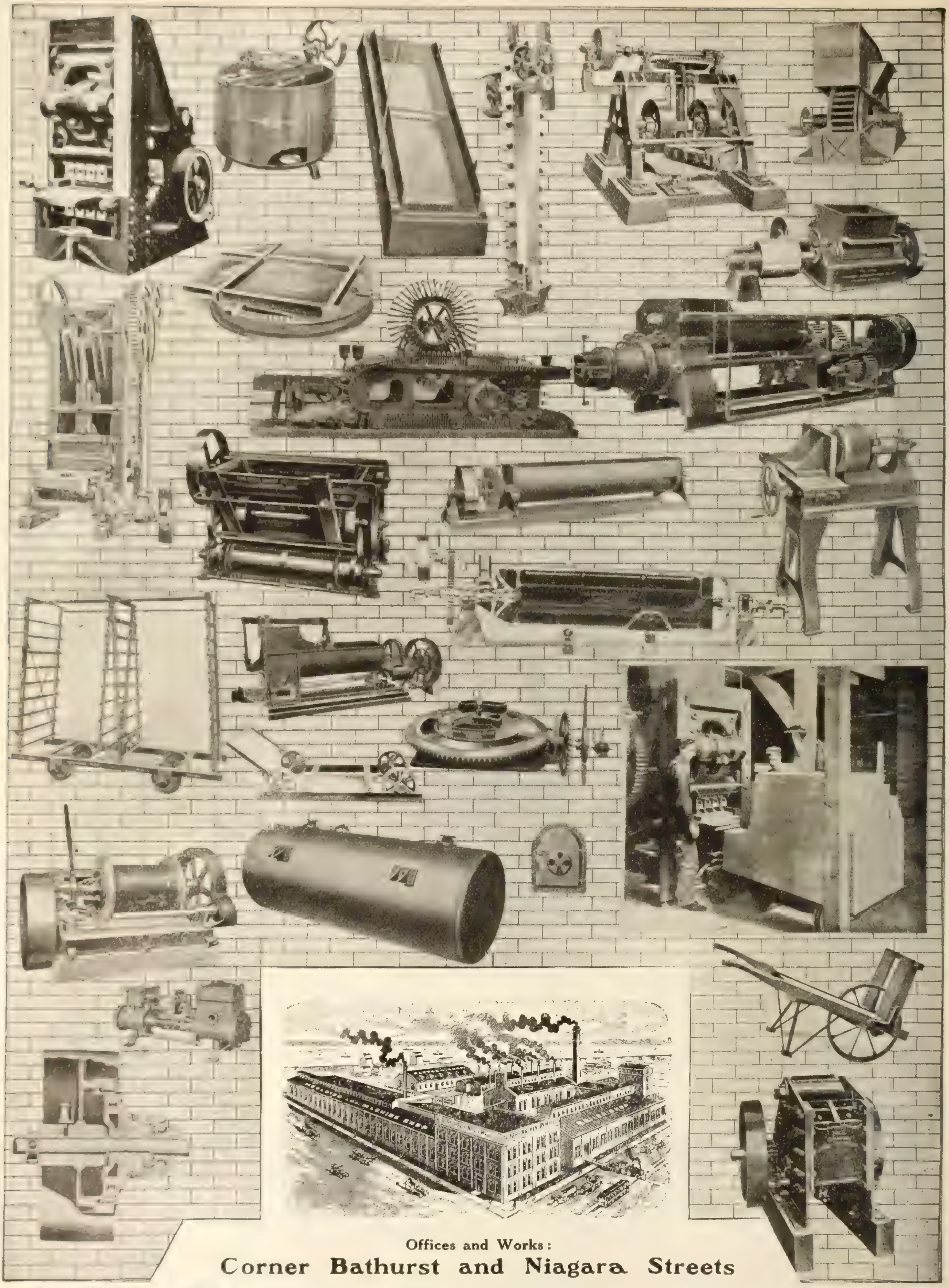
The Roman Stone Company Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal



Offices and Works:
Corner Bathurst and Niagara Streets

The Berg Machinery Manufacturing Co., Limited
Toronto - Ontario

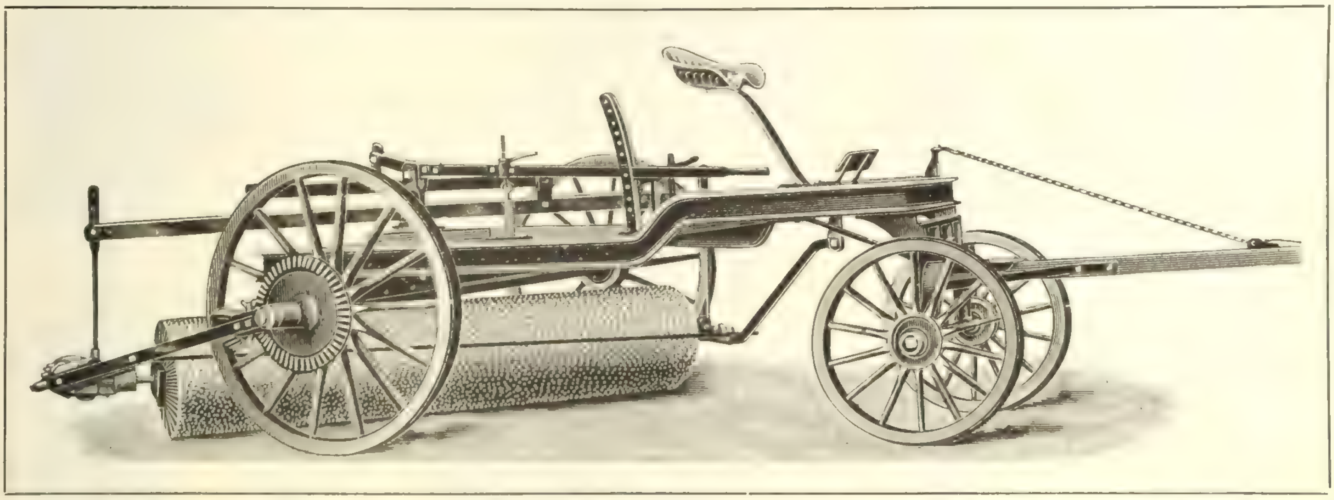
Two Big Leaders

"Keystone" Street Sweepers

and

"Champion" Street Sprinklers

THESE TWO SPECIALTIES are without a doubt two of the best examples of the quality maintained by the goods of this company. They are in no sense experiments, being in use from one end of Canada to the other with unfailing satisfaction to their owners.



We Claim for the " CHAMPION " SWEEPER

1. Perfect work on uneven road surfaces.
2. Light draft.
3. No contact between machinery parts and sweepings.
4. Steel fibre brush—thoroughly effective.
5. Power applied at heavy end of broom.
6. Adaptability to any class of roadway.

THE SPRINKLER This splendid sprinkler has every improvement of proven value. It is made in all sizes and styles to suit every requirement, but for ordinary use we recommend the horizontal steel tank with wood ends, platform spring or reach gear sprinkler, with steel frame and vertical spray sprinkling attachments. This style is made in four sizes, viz: 1000, 750, 600 and 500 gallon.

Send for Catalogue giving full description of these and the "Champion" Road Machinery.

The American Road Machine Company of Canada, Limited, Goderich, Ont.

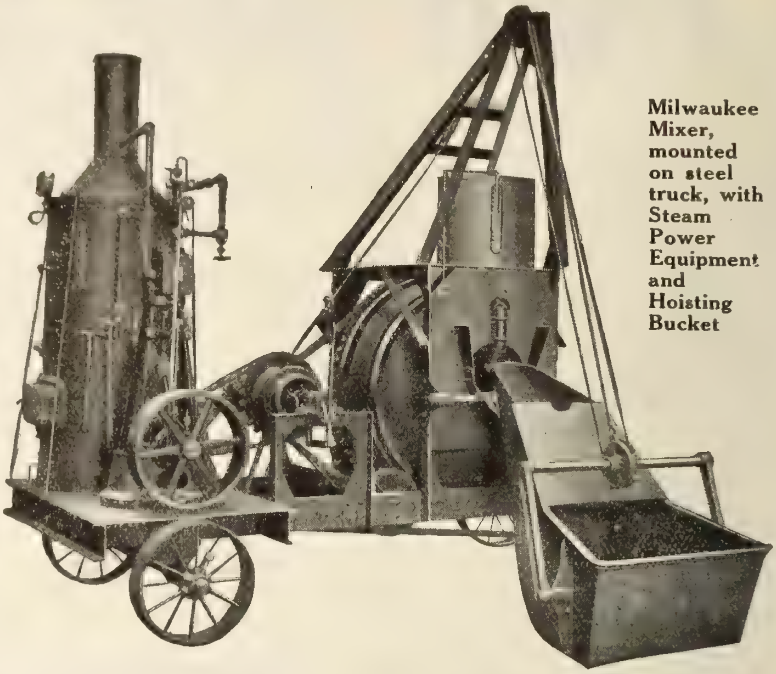
The Hamilton Machinery Company, Ltd.

Hamilton, Ont.

Also Canadian Distributors for the famous "Interstate" Automobile

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES.

The Stewart Machinery Co., Winnipeg, Man. C. W. Stancliffe & Co., Vancouver, B. C.
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS

Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

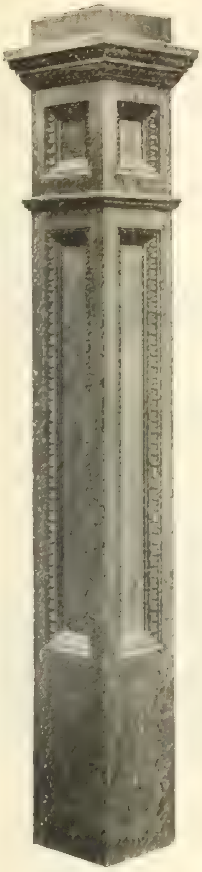
We make

Tanks and Towers

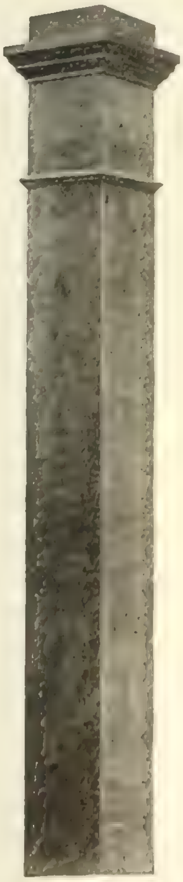
for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada



Newel Post
No. B.L. 106



Newel Post
No B.L. 203

BATTS

Limited

FOR

Columns
Newel Posts
Doors
House Trim
Sash

With our immense column department containing over 10,000 square feet of floor space and equipped with up-to-date machinery we are able to handle your orders promptly and properly.

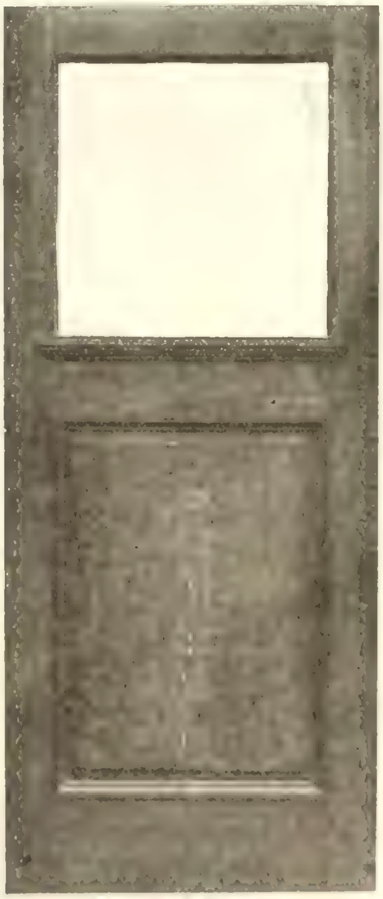
Our doors do not warp, sag or check.

We have a catalogue for you

Batts Limited

374 Pacific Ave., West Toronto

Door No. B L 312



Door No B L [illegible]

Circular Diamond Saws

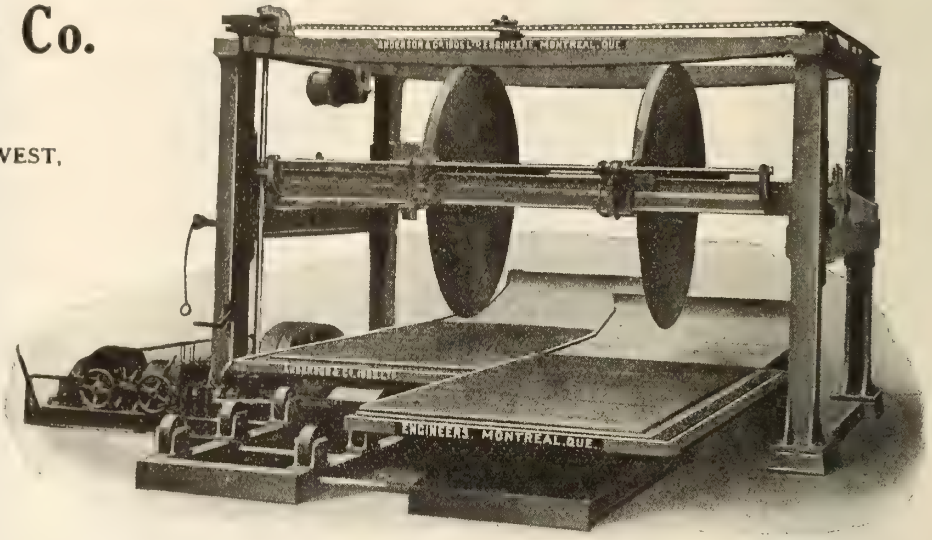
For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICES & WORKS
London, England, 82 Victoria St., S.W.
Newark, N.J., U.S.A. 420-422 Ogden St.
Montreal Works, 157 Craig St. West
Head Works, Carnoustie, Scotland

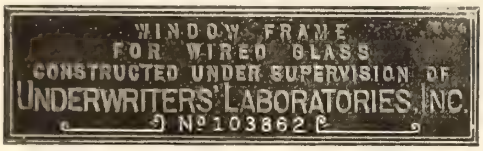
MAKERS OF

Gangs, Planers, Marble Dressers, Derricks, and Electric Traveling Cranes up to 50 tons, Quarry Machinery, Gas Engines and Producer Plants.
10 H. P. to 150 H. P.


ANDERSON & CO. 1905 L. ENGINEERS, MONTREAL, QUE.
ENGINEERS, MONTREAL, QUE.

Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 SINGLE AND DOUBLE TABLES

About 50 of the above Machines at work in Canada



WINDOW FRAME
FOR WIRED GLASS
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES, INC.
Nº 103862

Underwriters' Label.

The Underwriter's Test

There is absolutely no question as to the comparative value of our Metal Fireproof Windows over the old-fashioned metal or metal-covered wood shutters. Repeated tests have proved conclusively the superiority of metal fireproof windows.

The ideal fireproof windows should be constructed to meet the following requirements:

It must be absolutely fireproof.

It must have hollow sheet metal frames and sash, fitted with wire glass.

It must be riveted and locked together so that it will not fall apart when exposed to intense heat, solder only being used to finish the seams and mitres.

The Douglas Window has stood the National Board of Fire Underwriters' test to which it has been subjected at their Laboratory at Chicago, and is endorsed by them.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

The

Tillson Company

Limited

Wholesale Manufacturers of

Sash, Doors, Mouldings, Frames for Doors and Windows, Columns, Interior Finish of Every Description, Porch Work, Gable Ornaments, Brackets, Head Blocks, Corner Blocks, Base Blocks, Door and Window Screens, Etc.

Millwork of all kinds

Tillsonburg,

Ontario

The Steel Company of Canada

Limited

Hamilton - Toronto - Montreal

PLAIN ROUNDS,
& SQUARES,
COLD TWISTED
SQUARES

MAXWELL
DEFORMED BAR

STEEL BARS

for Reinforcing Concrete

J. H. NEW, President

RYLAND H. NEW, Vice-President

Don't be an Experimental Engineer

Don't be misled by the Local Cement Pipe Manufacturer. The man with a machine backed up to a sand and gravel pit, who don't know his business, and if perchance he did, who couldn't make sanitary sewer pipe out of cement. Then again there is the man who appeals to your council and yourself on the old cry "Patronize Home Industry." We suggest to you not to be an *"Experimental Engineer"*, that is of course if you have the interests of your work at heart. There is only one material for sewers and that is

Vitrified Salt Glazed Sewer Pipe

and Hamilton is the place to buy it.

50 Years in Business

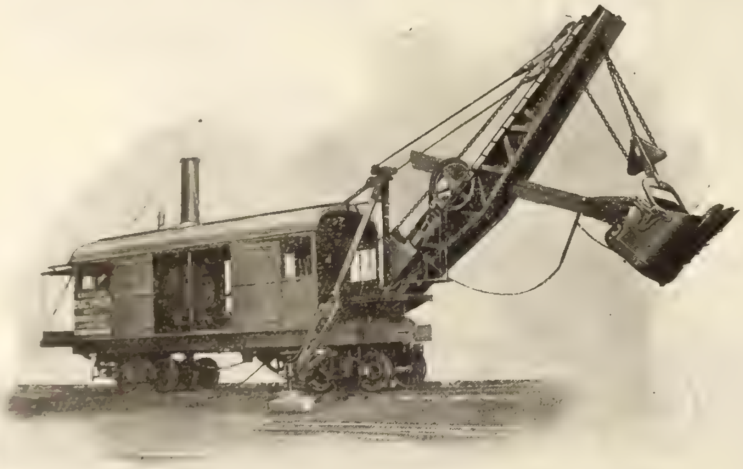
The Hamilton & Toronto Sewer Pipe Co.

Limited

HAMILTON and TORONTO

Long Distance Phones:—Toronto, Main 990, College 1558. Hamilton, 3990, 3991, 3432.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:

Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert Pipes

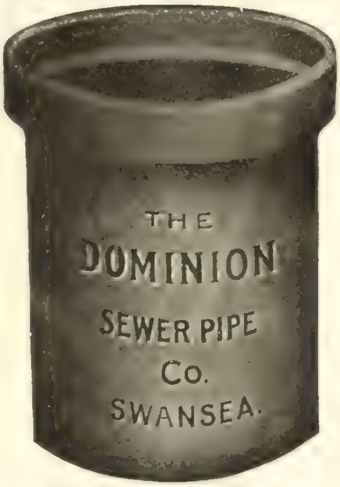
We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
- **Chimney Tops**
- **Flue Linings**
- **Wall Coping**
- **Culvert Pipe**
- **Inverts**

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Large Contracts are our Specialty

The Pipe that makes
THE SEWER SURE

ROUND Pipe and SQUARE Dealings

WE carry a stock in all sizes, 4 inch to 24 inch, large enough to keep any job going regardless of the press of business in one-car orders.

That means money to you

No waiting on pipe when you place your orders for "MIMICO" goods, and it is also 99 9/10% right when it arrives.

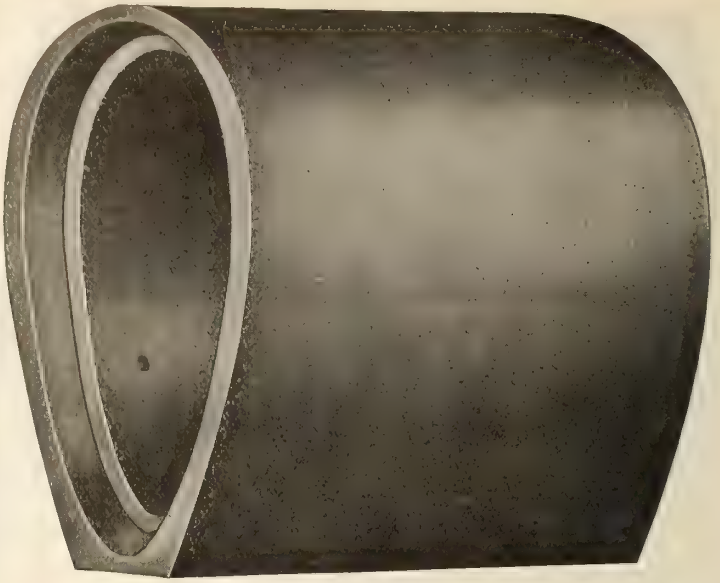
It Saves You Worry
Worry Shortens Life

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422, Evenings Park 3888 and 3889

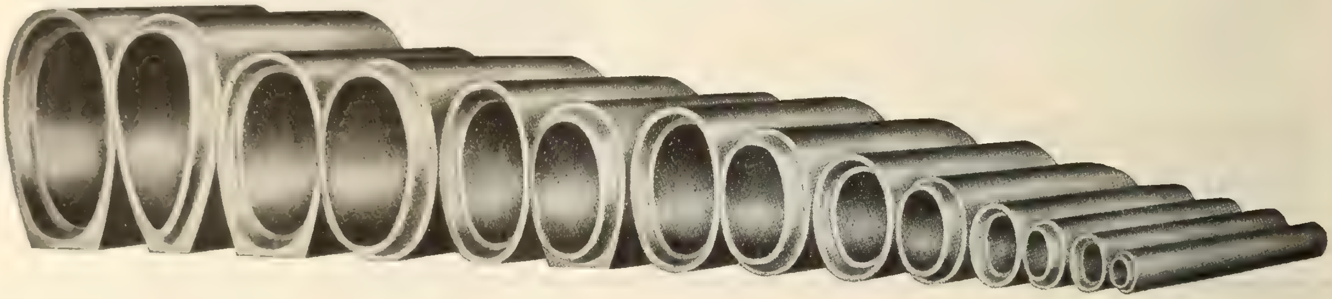
Municipal Engineers and Contractors

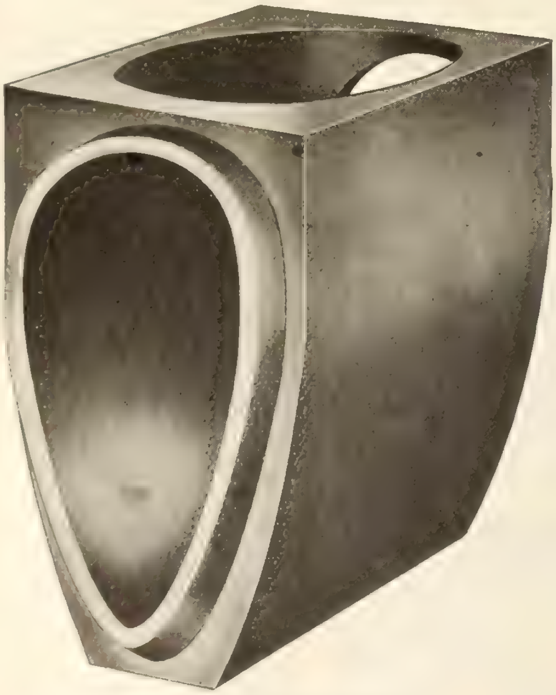
For **sewers** the only everlasting pipe is **concrete.** Builders do not use brick in foundations. Why? Because of the moisture. They do use concrete. Why? Because it is a proof against the destructive tendency of moisture. Why continue to use brick for sewers when a better material is now available at as low a cost?

In **Duluth** brick sewers failed after seven years so as to require replacement. **Concrete** sewers put in at the same time are **intact.** In **Millwaukee** after 25 years concrete pipe was found better than when new. Of 300 miles of sewers in **Millwaukee** over 200 miles are of **concrete.**



Section of 2' x 3' pipe





Man-hole Section of 2' x 3' pipe

Concrete sewers abound in **England** and **Germany.** The modern **sewers** of **Paris** are all of **concrete.** American cities have adopted it. **Brooklyn** has hundreds of miles of it with not a single failure, whereas even Scotch vitrified pipe has been found to have deplorably failed there. **Toronto,** after much hesitation, is now in line with concrete. Why be the last to join the ranks you eventually will and must join?

Our circular and egg-shaped sewer pipe are unsurpassed in quality, are more easily laid than flanged pipe, and give no trouble or ridiculous expense over man-holes or connections.

We have replaced vitrified pipe with concrete pipe and have found over 50 per cent of the vitrified unfit for re-laying. We carry a large and mature stock, we guarantee the quality, we take care of breakage in transit, and we solicit your patronage.

WRITE FOR CATALOGUE PRICE

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO

THOS. & WM. SMITH, LD.,
WIRE ROPE MANUFACTURERS,
NEWCASTLE-ON-TYNE, ENGLAND.

ELECTRIC CABLEWAY OVER THE ZAMBESI RIVER AT THE VICTORIA FALLS.
Span, 870 feet. Working Load [illegible] tons. Main Cable [illegible]. Breaking Strain of Main Cable [illegible] tons.
Main Cable supplied by Thos. & Wm. Smith Ltd., Newcastle-on-Tyne.

HIGH-CLASS WIRE ROPES
For CONTRACTORS' WORK, such as BLONDINS, CRANES, INCLINES, BALLAST ROPES,
&c., &c., and all classes of work requiring Wire Ropes

AGENTS IN CANADA
EVANS, COLEMAN & EVANS, Ltd., Vancouver.
ANGEL ENGINEERING & SUPPLY CO. Ltd., St. John's, N.F.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg.
BAINES & PECKOVER, Toronto.

REPRESENTATIVE FOR CANADA
D. W. CLARK, P.O. Box 521 TORONTO, ONTARIO.

USE ONLY SMITH'S "RED THREAD" WIRE ROPES.

The Only Everlasting Roof

Asbestos Cement Slate

"This is practically indestructible by atmospheric influences, so that maintenance expenses for roofs covered with this material are excluded.

For a period of three months the asbestos cement slate absorbs, and assimilates moisture in exactly the same ratio as the best natural slate. After that time the absorption ceases altogether, and the material becomes impervious, indestructable, and as hard as iron.

The stringy asbestos fibres, which, by characteristic peculiarity of a patented process, are embedded cross-wise in the cement paste. This has exactly the same effect as concrete-steel constructions. They impart to the asbestos slate extremely high physical strength, indifference to blow or shock, and great elasticity. These properties are of the same importance to conveyance, and the laying of the asbestos slates, as they are to their durability and length of service.

The insulating capability of asbestos when brought to bear either upon heat or cold, imparts an increased importance to asbestos cement slate, not only in its suitability for the tropics—where it is commonly used as a substitute for corrugated iron; but also for the continental climate, where it is economically used in workshops, in dwelling rooms, and particularly over garrets, which, with other roof coverings, would have to remain unoccupied.

The fireproof quality of asbestos renders asbestos cement slate a thoroughly fireproof material, which, owing to its strictly scientific manufacture, cannot become either cracked, rent, or scaled in case of fire."

The above is an extract, word for word, from a government report of the Canada Department of Mines.

We are the only manufacturers of asbestos shingles or slates in the Dominion of Canada."

Specify

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P. Q.
Factory at Lachine, P. Q.

CORINTHIAN STONE

was used in this building as well as for two others for the same proprietor. Why!

Because it was the Best

The same reason applies to others.

Any Size

Any Shape

Any Quantity

Send us your Plans for Prices

Weber Chambers, King Street, Berlin --Architect, Chas. E. Cowan, Esq., Berlin

Erected 1910 by the I. S. K. WEBER CO., LIMITED, BERLIN

All the Stone for above building supplied by

The Corinthian Stone Co.

OFFICE AND WORKS:
G. T. R. JUNCTION, GUELPH, ONTARIO

For Rapid, Permanent Fireproof Construction

PEDLAR Ferro-Dovetail Plates solve the problem of the architect, engineer or builder who wants to economically erect fireproof floors and ceilings. Ferro-Dovetail plates abolish the need of wooden centerings for concrete floor slabs on a steel superstructure. To use Ferro-Dovetail Plates, it is merely necessary to lay out the steel arrangement to a maximum of 5' 6" or 6' spans; Ferro-Dovetail Plates come in sheets to fit these spans, allowing a 3" end lap. At this end lap, the corrugations are spread so that the sheets will interlock. The contractor lays

PEDLAR
Ferro-Dovetail Plates

for the steel superstructure, just as he would lay planks, lapping and interlocking the plates at the edges. As soon as this is done all that is necessary is for him to have a plank runway for his wheelbarrows and he may then apply his concrete to the desired depth of slab.

As soon as the concrete has set, the plasterer steps in on the job and plasters the underneath side of the Ferro-Dovetail Plates, using ordinary plaster with a good proportion of hair in the grounds. Ferro-Dovetail Plates are then thoroughly imbedded, after which the ceiling is properly finished and plastered.

Pedlar Ferro-Dovetail Plates being thus protected by the cement and plaster will last forever. The cement and plaster being bonded and reinforced by the steel, cannot disintegrate or fall off.

For roofing, Ferro-Dovetail Slabs can be waterproofed with felt roofing, mastic Asphalt or other good roof covering.

There is not an ounce of combustible material in a Ferro-Dovetail roof and because of that, fire insurance underwriters make rate concessions upon buildings upon which they are used.

Ferro Dovetail roofs are especially suitable for buildings exposed to smoke, acid fumes, gases, condensation or moisture—in short, for such places as manufacturing plants, chemical works, rolling mills, galvanizing plants, plating works, foundries, round houses, train sheds, breweries, power houses, etc.

If you are interested we will be glad to send you our new book on Pedlar Ferro-Dovetail Plates, **free on request.** Ask for bulletin No. 52.

The PEDLAR PEOPLE of Oshawa

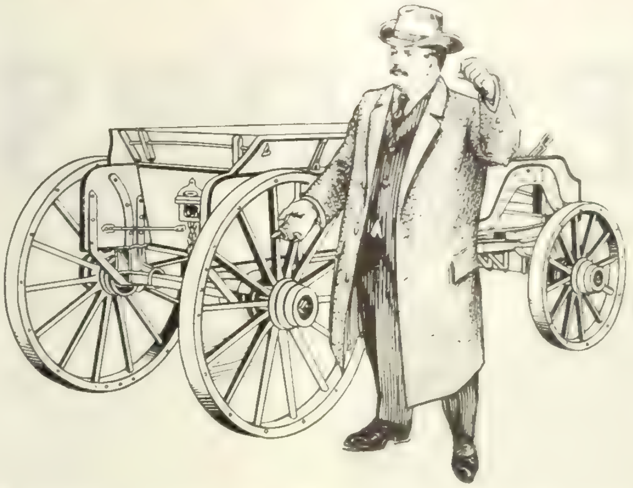
Established 1861 — Established 1861

HALIFAX, 16 Prince St.; ST. JOHN, 42-46 Prince William St.; QUEBEC, 127 Rue de Pont; MONTREAL, 321-3 Craig St. W.; OTTAWA, 423 Sussex St.; TORONTO, 111-113 Bay St.; LONDON, 86 King St.; CHATHAM, 200 King St. W; PORT ARTHUR, 45 Cumberland St.; WINNIPEG, 76 Lombard St.; REGINA, 1901 Railway St. S.; CALGARY, Room 7, Crown Block; EDMONTON, 633 Fifth Ave. North of Jasper; VANCOUVER, 319 Pender St.; VICTORIA, 434 Kingston St.

ADDRESS OUR NEAREST WAREHOUSE
WRITE FOR DETAILS

WE WANT AGENTS IN SOME SECTIONS
MENTION THIS PAPER

Jim Fellowes Talk:



I know that comparisons are sometimes unkind. But they are mighty enlightening, and that's the main reason why they are made.

You may naturally suppose that I'm unduly prejudiced in favor of the Watson Dumping Wagon, so I'm going to suggest a scheme to "put it up to you."

Examine any WATSON dumping wagon anywhere, any age, and compare the condition of the wagon and the service you find with that of *any* other make of dump wagon of similar age. Nobody barred on this test. No price limit; no age limit.

If you will resolve to make such comparison at first opportunity, I'm willing to take all chances on where the Watson stands after your comparison. In fact, having been making these comparisons for years, in my travels about the country, I think I know the answer already. But try it.

Meanwhile, maybe you would like the printed matter. Just address JIM FELLOWS, CANASTOTA, N.Y.

Watson Wagon Company, Canastota, N.Y.

The First Builders of Bottom Dumping Wagons

BRANCH OFFICES:

256 Broadway, New York, N.Y. 604 Witherspoon Bldg., Philadelphia, Pa. 806 Renshaw Bldg., Pittsburg, Pa.

THE POPULAR AND SUPERIOR

PERFECT BRICK MACHINE

AND MY VARIOUS MOULDS ARE USED IN ALL PARTS OF THE WORLD

Patened in Canada

C. S. WERT

Inventor and Manufacturer of

The Perfect Brick Machine and Moulds

602 North Main St.,
Kendallville, Ind., U. S. A.

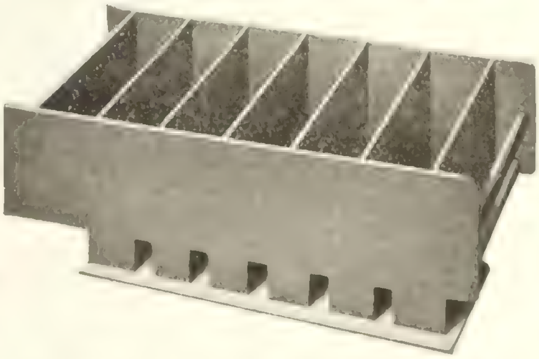
Write for Catalogue and Prices

Agents and Distributers wanted in Canada.

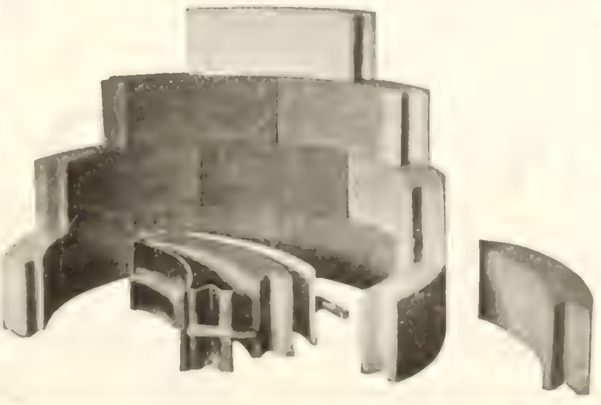
THE POPULAR AND SUPERIOR

PERFECT BRICK MOLD

IS USED IN ALL PARTS OF THE WORLD



The Perfect Well, Cistern and Silo Molds



PRICE LIST

No. [illegible] Circle Mold. The diameter of its circumference, [illegible] feet. No. [illegible] Circle Mold. The diameter of its circumference, [illegible] feet. No. [illegible] Circle Mold. The diameter of its circumference, [illegible] feet. All sizes up to [illegible] feet retail at $[illegible] each. All other sizes retail at $[illegible] each.

The Circle Molds vary in length from [illegible] to [illegible] inches, depending on the diameter of its circumference.

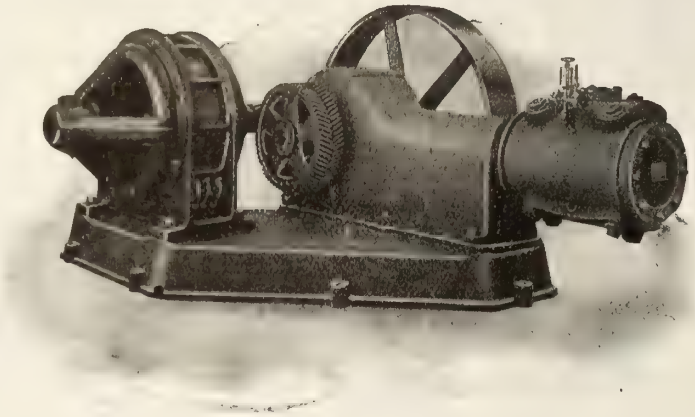
In ordering Circle Molds always give the diameter of what you will desire to build and I will then understand [illegible]

No. [illegible]
No. [illegible]
No. [illegible]

Price $15.00 each

Portable, Gear Driven

COMPRESSORS



Rand Class "NE—1" Straight Line Compressor mounted on a rigid sub-base and geared direct to an Electric Motor. A high speed, simple and perfectly automatic machine particularly adapted to contracting duties, where electric power is available.

The gear driven Class **"NE-1"** Compressor is a simple, reliable design in which automatic operation is combined with great power economy. This type permits of the advantage of direct electric drive at a very moderate first cost.

It is a well known fact that power economy is best effected by generation from a central plant.

Why not take advantage of this direct electric drive and economize on your power consumption, instead of generating your own power by small expensive boiler units.

Class "NE-1" Compressors are built in standard capacities of 50 to 300 feet free air per minute. Pamphlet K-92.

PNEUMATIC TOOLS **ROCK DRILLS**

CANADIAN RAND CO., LIMITED

Commercial Union Building, MONTREAL, CAN.

Toronto, Cobalt, Winnipeg, Lethbridge, Rossland, Vancouver, Halifax
South Porcupine Spokane Sydney

A Chat on Sales

ONE of the important things that you are interested in is information that will enable you to sell more at a lower cost in a better market.

MACLEAN DAILY REPORTS are organized and operated on a plan entirely new in Canada—a plan that will supply you with fresh, dependable, accurate news —telling you DAILY where there are possible buyers, what they want and when they want it.

This information is obtained by our own staff of reporters and correspondents, by personal interview with people in authority.

Our Service tells you about the proposed operation long before the other man knows. It enables you to select from the whole field those opportunities that promise the most profit and which you can handle to the best advantage. It enables you to follow up all sales possibilities persistently and aggressively.

Ask us to tell you what it will cost to keep you informed every day on all the live sales possibilities relating to your business. Ask us to send you specimen reports.

MacLean Daily Reports Limited

220 King St. West
TORONTO ONTARIO

Hercules Waterproofing Compound

Manufactured in
Powder and Liquid Forms
by

The Hercules Waterproof Cement Company

BUFFALO, N. Y., U. S. A.
Distributors in:
Niagara Falls, St. Catharines, Welland, Hamilton, Toronto, Ottawa and Montreal

ABSOLUTELY the only Waterproofing Product on the market giving Impermeability with Increased Tensile and Compression Strength to Concrete.

The report of Mr. Peter Gillespie, Lecturer of Applied Mechanics, University of Toronto, shows by the use of 2% Hercules Compound thoroughly mixed with dry Portland Cement before the addition of sand or water, an average Increase in Tensile Strength of over 10% together with Absolute Impermeability, as compared with the same mix of the Portland Cement without the incorporation of Hercules Compound.

While this increase as shown in Mr. Gillespie's laboratory test is very considerable and makes Hercules a factor in all concrete work,—the result secured by Engineers on cubes containing a 1:3:5 mix, and made after the manner of the construction work for which they were tested, has shown an increase of from 18 to 25%, together with Absolute Impermeability. CAN YOU BEAT THIS?

Hercules Waterproofing Compound is not an experiment. We can furnish photographs showing work and furnish letters from Engineers, that positively places Hercules Waterproofing and Strengthening Compound in a class by itself.

Circulars, Catalogues and General Information cheerfully furnished upon request.

[illegible] House, Britannia Heights, near Ottawa, Canada. Architect, Bungalow Craft, Los Angles Calif. Frontage, 38 feet, depth 38 feet. Cost Complete $5,400.

This is the kind of work you can do with

"IDEAL" FACE DOWN CONCRETE BLOCK MACHINES

Architects and Engineers are specifying Concrete Blocks in place of Brick and stone.

Builders, who operate their own "IDEAL" Machines, not only get the contracts, but are in a position to guarantee promptness and make an excellent profit on materials.

Let us send you complete catalogues, showing styles of machines and the complete line of Facings, Lintels, Sills etc.

Reliable and Energetic Agents wanted in every Locality

IDEAL CONCRETE MACHINERY CO., LIMITED.
LONDON, ONTARIO

Rock Channelers

For Sale

We offer for immediate delivery F. O. B. cars Niagara Falls, Ontario:

Two Sullivan "Z" Channeling machines, latest type, to be run with air, Machines equipped with air reheaters, 30 feet sectional track, and all tools. Full outfit of "Z" or gang bits to cut 12 feet, and stock of repair parts.

These are swivel head machines and have been used only a few months; are in perfect order and can be seen in operation on our work, Queen Victoria Park, Niagara Falls, Canada.

For Photos and Full Information Address:—

Purchasing Agent,

The Ontario Power Company
of Niagara Falls
NIAGARA FALLS, ONTARIO.

Steel Bridges

and Concrete Work

For over a quarter of a century we have been building Steel Highway Bridges throughout Canada.

Our experience is at your disposal.

We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

Get our figures before closing your contracts.

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

The Contractor's "Money Saver"

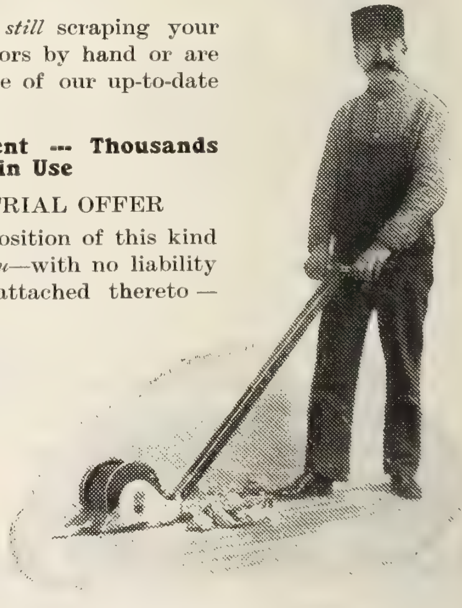
Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment --- Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto — write us **to-day.**

MACHINE PAYS FOR ITSELF IN A FEW DAYS.



"Little Giant Floor Scraper"

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

Tel.
Main 4155

We are now
in the
Sand Business

Our Wagons hold 2½ Yards
High Grade Sand and Prompt Delivery

Rogers Supply Co.

28 King St. West,
Toronto

WHY IS KITON

Superior to Ordinary Tar?

BECAUSE:

KITON is free from inflamable organic solvents, and therefor far less combustible than tar.

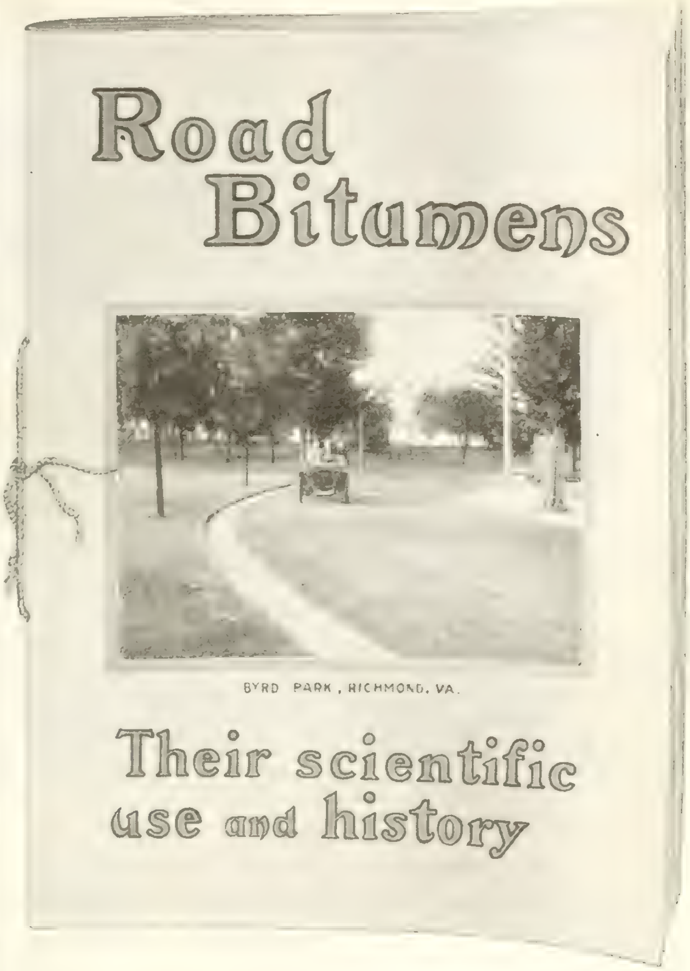
KITON is soluble in water, and in this diluted form can be applied to any surface, whether rough or smooth, hot or cold, wet or dry, as easily as paint. As soon as once dry, **KITON**, like Tar, is absolutely insoluble in water and permanent. Hence its use for

Weather and Waterproofing

KITON will cover a larger area than the same weight of tar
KITON will do the work better and quicker.
KITON is so easily handled.
KITON needs neither fire nor tarkettle.
KITON will never run, if exposed to the heat of the sun.
KITON will stick positively to any surface.
KITON will take any whitewash, or a finish coat of plaster or cement.
KITON can be coloured.
KITON has none of the drawbacks of tar, but has all of its advantages, and then some.
KITON is cheaper in the long run.

ASK FOR PRICES AND SAMPLES

F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.



Road Bitumens

BYRD PARK, RICHMOND, VA.

Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a phamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement
Company
First National Bank Building
CINCINNATI

C. P. R. Freight Car Repair Shop, West Toronto

We completed this job in 2 months

WELLS & GRAY, Limited, Engineers and Contractors, **Toronto**

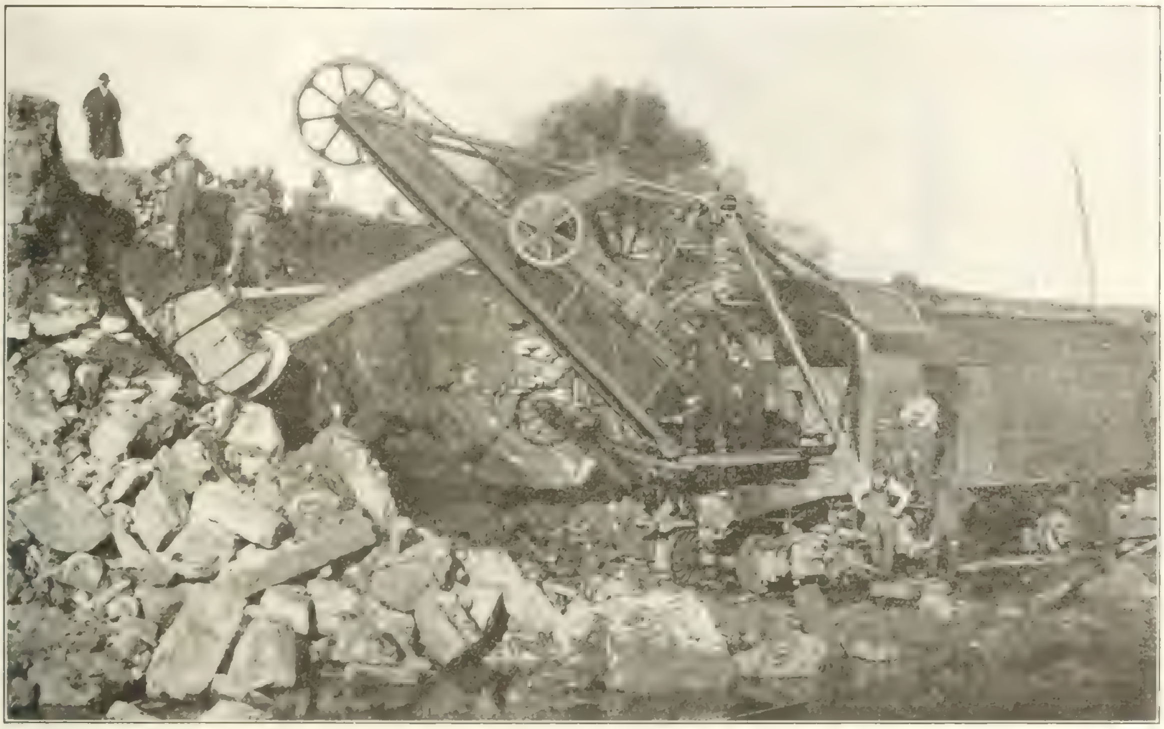
Doors, Sash, Frames, House Trim

Midland Brand

All manufactured in our new and up-to-date factory with latest and best machinery. A knowledge of the requirements of contractors and architects demanding high grade material has enabled us to market interior finish that can't be beaten

Georgian Bay Shook Mills, Limited

MIDLAND, ONTARIO



Class 45 16 2½ Atlantic Shovel built for Edgar S. & L. W. Reade, Contractors
At work on the construttion of the Canadian Light and Power Company's Canal, at Valleyfield, Quebec, Canada

BUILT BY
MONTREAL LOCOMOTIVE WORKS, LIMITED

Atlantic Steam Shovels are different from other steam shovels. They are built along lines established by experience. They have direct wire rope hoist and a locomotive type of boiler. They are designed and constructed along well tried out principles, and do the most work for the least cost.

WIRE ROPE HOIST

exerts a direct pull on the dipper and substitutes friction of a rope with one sheave for that of a chain with from four to six additional sheaves, greatly increasing the efficiency of the shovel and decreasing cost of maintenance.

Wire rope is safer than chain because it does not break without giving warning. It shows signs of wear by breaking strands and can be replaced at a regular shut down. Chain breaks suddenly, causing suspension of work until it can be repaired.

Behind each Atlantic shovel is the knowledge of requirements in the Contracting field, and the application of this knowledge in using the right materials in the right places.

Every part is made in jigs or to gauges, and every repair part is sure to fit. We are prepared to furnish repair parts at short notice from our works at Longue Pointe, Montreal, Canada.

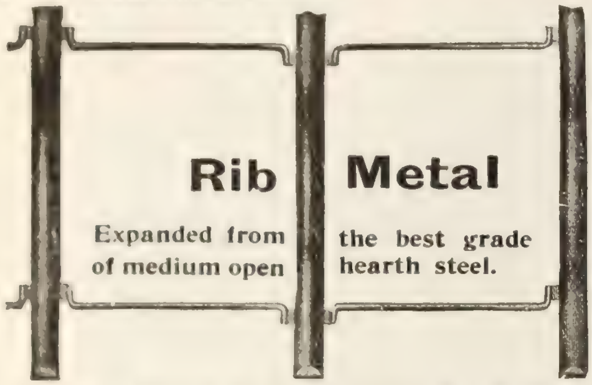
MONTREAL LOCOMOTIVE WORKS, LIMITED

OTTAWA BANK BUILDINGS, MONTREAL, CANADA

KAHN SYSTEM

[illegible] Includes Rib Metal for floors, roofs, walls conduits, etc.

Maximum efficiency combined with economy in handling, cut to exact length. Working drawings furnished.



Rib Metal

Expanded from the best grade of medium open hearth steel.

Kahn Trus Bars increases the strength of beams 20 to 33 1/3%. Saves labor on the work eliminating wiring and bending, being **shop prepared** means a great saving of time and labor to the contractor.

Other products, Rib Bars, Hy Rib and column hooping United Steel Sash. Trus-Con chemical products for water proofing and finishing concrete surfaces. Estimates and catalogues furnished cheerfully.

Trussed Concrete Steel Co.

of Canada, Limited

Head Office: WALKERVILLE - ONTARIO

BRANCHES:

TORONTO—23 Jordan St. WINNIPEG—Union Bank Bldg.
MONTREAL—128 Coristine Bldg. VANCOUVER—52 Hutchinson Bldg.
AGENCIES: QUEBEC, HALIFAX

The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another.

Tide Water Iron Works

HOBOKEN, N.J. U.S.A.

More Mortar with

Renfrew Lime

That is why it will pay you to use it in place of some inferior brand. We have been established for twenty-five years, and are still growing, and why? Because 'RENFREW' LIME simply CAN'T BE BEATEN.

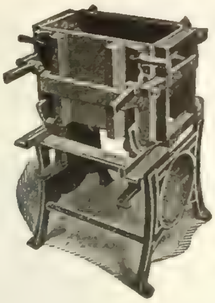
ALWAYS USE

'Renfrew' the Lime of Quality

Jamieson Lime Co.

RENFREW, ONTARIO

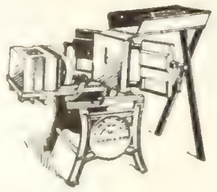
White Lime - Stone - Grey Lime
Brick - Drain Tile



London

Face-Down Adjustable

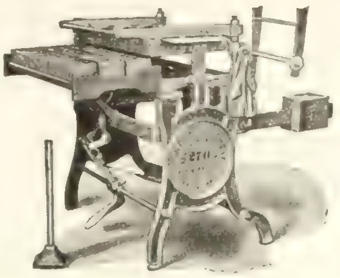
Concrete Block Machine



makes every kind, size and design of block. **All sizes of blocks made** in the **one adjustable mould. All sizes of blocks made** on the **one size pallet.**

Any size core desired can be used which is withdrawn vertically and thus allowing all blocks to be made by the wet process, or with crushed stone in the block. Machine fully **covered by patents.**

SEND FOR CATALOGUE.



London Cement Pressed Brick Machine

Hundreds in operation. 'Needs no recommend from us. The brick **have frog impression.** The only machine which makes a brick **polished on every side.** Our **self-racking pallet** does away with racks for curing which makes it possible for the contractor to manufacture the **brick on the ground** where the building is to be erected. One man operating makes 5000 brick per day.

Our catalogue tells all about it.

The London Adjustable Sill, Step and Window Cap Mould

Every Contractor and Manufacturer of Cement Products should know the class of goods that can be produced on this mold. **Can you afford to be without one?** Write for catalogue and learn what this mold will do.

We also manufacture London Standard Drum Batch Mixers in five sizes, London Automatic Batch Concrete Mixers in two sizes, Cement Brick Machines, Face-Down Block Machines, Power Drain Tile Machines, Hand Drain Tile Machines, Silo Curbs, Sewer Pipe Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

London Concrete Machinery, Co., Ltd.

19 Marmora Street, London Canada

Branches

A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N. S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.

No Wet Cellars No Damp Basements

Ceresit is a cream white paste readily dissolvable in water. This water is used instead of plain water for mixing Cement, Mortar or Concrete.

Ceresit Waterproofing Co.

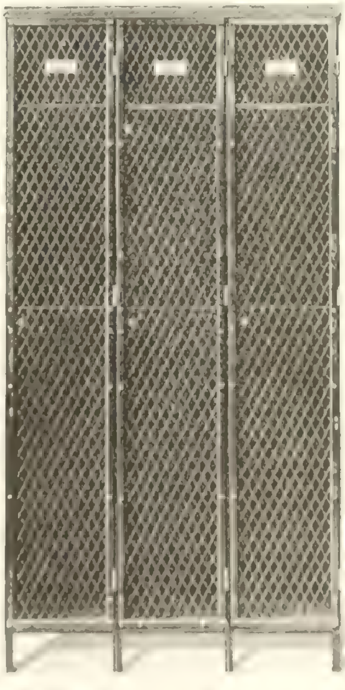
115 Adams Street, Chicago

Canadian Agents

Eadie Douglas, Limited
Montreal, Toronto, Ottawa

Grose & Walker, Limited, Winnipeg
Dean-Thompson, Vancouver

The Up-to-Date Building



Should be equipped with metal lockers for the safe and sanitary keeping of clothing.

If you appreciate good value and rigid construction in a locker, you will use MEADOWS' METAL LOCKERS on your next contract.

Send for our interesting booklet entitled

"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA

EADIE-DOUGLAS LIMITED

HEAD OFFICE: 12-14 University Street, MONTREAL

Building and Mechanical Supplies and Specialties

BRANCH OFFICES:

TORONTO, - - 65 Victoria Street
WINNIPEG, - - 445 Main Street
OTTAWA, - - 198 Queen Street

REPRESENTING

Leeds Fireclay Company

Burmantofts Architectural Terra Cotta and Enameled Brick. Used by leading Architects and in representative buildings throughout Canada.

"Keystone" Fireproofing Company

Keystone Gypsum Partition Blocks and Furring. Fireproof, Soundproof, better and cheaper than Terra Cotta.

"Esco" Steel Coating and Preservo

A Waterproofing preservative paint for steel, wood and concrete. The solution of all paint difficulties. **PRESERVO — A preservative and waterproofing** for canvas.

"Terrano" Flooring Co'y of Canada, Limited

Terrano Jointless, sanitary flooring. Laid throughout the world, in hospitals, schools, hotels, private houses, power plants, factories, warehouses, etc.

Alphons Custodis Chimney Construction Co.

Custodis Radial Brick and Concrete Chimneys. Are in service in the largest plants in Canada and are lasting monuments to good judgement and business enterprise.

Edward Darby and Sons Company

"Pen Dar" Metal Lockers are the standard throughout Canada. The strongest and best constructed metal lockers, in all different styles and prices.

Mellows & Company Limited

Eclipse Lead Covered Clazing Bars for skylight Construction. Last a lifetime without any painting or repairing. MELLOWS STEEL SASHES AND CASEMENTS.

"Insulyte" Company Limited

A complete organization for the selling and installing all classes of insulating material.

B. F. Sturtevant Company

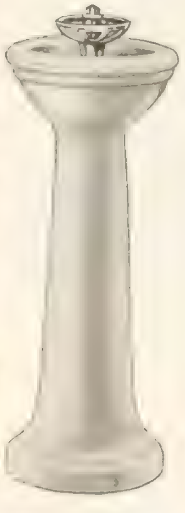
(Eastern Canada Only)

Sturtevant Electric Vacuum Cleaners, simple, effiicient and lasting. Ventilating and Heating apparatus, engines, motors, etc.

Send for catalogues and descriptive matter on any of the above lines that you are interested in.

THE STANDARD IDEAL COMPANY LIMITED

GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

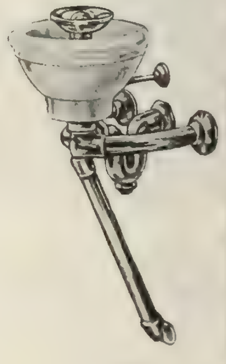


F. 290

Contagious diseases are spread by drinking out of contaminated glasses, cups and similar vessels, for in that manner one comes in almost direct contact with the mucrious membranes of preceeding drinkers.

With our Porcelain Enameled Bubbling Drinking Fountain the drinker cannot touch the cup; he gets a drink of running water with more security than from a fire clay fixture as our ware is positively non-absorbent

Advocate these fountains and reduce the spread of contagious diseases.



F. 292

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1888

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 June 14, 1911 No. 24

The Art of Criticising

Criticism is fair and legitimate. Most of us need to be hit, and hit hard sometimes, principally because we often get the notion that we have a monopoly of wisdom. This is particularly true of those who are accustomed to have their own way because for the time being they are placed in a position of authority. But criticism should be constructive rather than destructive. Most any fool can see the badness and the weakness in men and things. Faults are always glaring. But it takes a wise man to see the good which may be covered by the bad. Not to judge merely by superficial appearances requires knowledge. True criticism does not necessarily mean a pointing out of weakness. It may be the discovery of virtue. However, most criticism is of the other kind. It is just plain simple "knocking." Criticism of another generally acts as a boomerang upon the unjust critics, because the critic is most apt to point out in another the failing which is peculiarly his own. As a general proposition it is better to criticise yourself than to wait until another fellow gets a chance to criticise you; and be merciless to yourself in your criticism, if you expect mercy from another.

Confidence in the Crop

According to information to hand from Winnipeg, the favorable conditions that have surrounded agricultural operations in the west during the present season have been responsible for a great increase in public confidence regarding the outcome. It is not safe to make definite calculations as to the extent to which past records will be left behind, but it may be reasonable to use Mr. William Whyte's preliminary estimate of 200,000,000 bushels of wheat as a starter. This figure is reached by multiplying the acreage of approximately 10,000,000 by 20, the prospective average yield in bushels. There is always a possibility that the average yield will run over twenty bushels, as it did in Saskatchewan two years ago, and there is an equal chance that the acreage under wheat may be more that 10,000,000. There are those who say that the area will be nearer 12,000,000 acres, just as there are those who say that the average production is more likely to be twenty-five bushels. The estimates may be revised in a week or so, as the figures of acreage sown to the various grains will then be available.

With due consideration for the weather, current estimates of crop production may be accepted as a basis, and calculations, forward or backward, may be made in accordance with atmospheric developments from now on. There is reason to believe that with unfavorable conditions in July the total production of wheat may go as low as 140,000,000 bushels, the total for 1909, but it can scarcely be less than that amount. On the other hand, it may run as high as 225,000,000 bushels, or about twice that of 1910. An average of these extremes will not be far from the actual total. There is every probability that the best records of past seasons will be broken. The average yield of wheat for a ten-year period in the west is about 18 bushels per acre. On an area of 10,000,000 acres, this would mean a yield of 180,000,000 bushels.

Toronto City Architect on the "Safe Side"

Apparently the City Architect of Toronto, Mr. McCallum, continues to find a certain amount of diversion in giving out odds and ends of interviews to evening newspaper reporters, who publish the impressions obtained from Mr. McCallum in a semi-technical strain which is not altogether discreditable to their ingenuity. Evidently the aforesaid reporters have caught something of the warlike spirit manifested by Mr. McCallum, for we find quite an extensive article appearing in a recent issue of the Toronto Telegram under the caption, "McCallum Sticks to Guns." From the stand Mr. McCallum has taken we can only assume that the metephorical allusion is to the guns of war and not to the new cement guns shown at the recent exhibition in Toronto. We are strengthened in this conviction by the consideration that Mr. McCallum has made some very unkind remarks about reinforced concrete construction. For instance, if we are to believe the Toronto Telegram, he says: "Concrete construction is a new form of building and it is a process which cannot be too closely watched. There is no other form of building in which it is so easy for builders to evade the bylaw, and it is only by the closest supervision that we can feel sure of the work.

"Then," Mr. McCallum continues, "it is not well known yet just what this form of construction will stand . . . . I have no right to take a chance . . . I know that the formula which I demand is safe and I intend to insist on it."

Now we cannot vouch for it that Mr. McCallum delivered these sentiments word for word. Unfortunately we were not present at the interview. But Mr. McCallum gets the credit for all this twaddle, and seemingly he is not altogether averse either to taking the credit or to leaving a stigma upon the work of the Citizens' Committee.

Mr. McCallum seems to be getting some support upon the ground that he is careful and that he is on the "safe side." But the architect or engineer who must have a wide margin of expense left to enable him to get on the "safe side" is a back number, now-a-days.

The City Architect has shown some disposition to explain things to the general public. Can he find a technical defence for his action in the case cited below, which is only one of a number of instances brought forward in the application for revision?

> Last summer one of the members of this committee proposed the construction of a reinforced concrete floor for a new school building in this city, basing his design upon the best Canadian and American engineering practice, but adopting the live loads specified in the Toronto by-law. A test was devised and carried out which demonstrated a capacity 37 per cent. in excess of the test requirements of the by-law, but the City Architect refused a permit and required the addition of concrete and steel which under ordinary conditions as to the prices of material and labor, increased the cost of the floor 21 per cent. If the excessive requirements of the present by-law respecting floor loads in schools had been taken into account, the extra cost of this floor over one rationally designed would have been substantially more than 21 per cent."

Finally, we would suggest that "The Telegram" employ its spare time in collecting more up-to-date information upon that "new form of building"—reinforced concrete construction.

An Interesting Report on Canadian Trade

His Majesty's Trade Commissioner for the Dominion of Canada, Mr. Richard Grigg, has just made a report on the Board of Trade, at London, England, on the trade of the Dominion of Canada for the period from July 1, 1906 to March 31, 1910. The report covers nearly every phase of Canadian operations and is divided roughly into three parts:

(1) A general survey of the economic conditions of the Canadian market.

(2) The import trade of Canada.

(3) A survey of particular branches of trade.

Trade conditions for the period named are analyzed very carefully and the figures relating to labor and to some of the principal commodities used by engineers and contractors are of practical interest.

More Brick and Less Fires

The two great elements of costly damage in a building are the marble or granite exteriors and the wooden and combustible interior trimming and decoration. The latter is being eliminated and at great jumps, doors and window frames can now be produced in metal as cheaply as in wood and floor surfaces can be and are made of plastic materials, cements, etc., vastly superior to wood in wear, comfort and fire-resistance and that cost no more. People still have the notion that granite, marble and stone are the proper caper in monumental buildings, surfaces that go all to pieces in a hot fire, but the business men tend more and more to wall surfaces of undamagable brick and terra cotta. You'll see brick and terra cotta preponderating to a still greater extent in 1911.—Brick.

Concrete fence posts for railway use have been studied and tested during the past year by the committee on signs, fences and crossings of the American Railway Engineering and Maintenance of Way Association, and the indications of the study are that they are practicable, durable and economical. In the report of the committee to the annual convention it is stated that the 8-ft. post is most desirable, and that those with a cross section approaching a square form are easiest made and most suitable for fencing. The spacing should be the same as for wood posts. The investigations indicate that the stone or gravel used in the concrete for these posts should pass a ½-in. square mesh and that the concrete should be mixed wet, in a batch mixer, and poured into the molds. Experience shows that extra precaution should be used in the selection of material, mixing of concrete, and handling and curing of the posts. It is observed that the poured posts are a little over 25 per cent stronger than tamped posts of the same size, mixture and reinforcement, and that they are also better able to withstand the action of frost and alkali. For best results posts are allowed to remain in the yard undisturbed for at least 60 days after coming from the molds. Breakage to be expected in handling and transportation is not in excess of 0.3 per cent.

Repairing Concrete Floors

There is a popular and widespread fallacy to the effect that a concrete floor once chipped or cracked is practically at the end of its usefulness. This is undoubtedly due to the results of unskilled workmen attempting to repair a damaged floor. Unless proper care is taken and the workman engaged on the job has sufficient knowledge of concrete, a repair job is most unsatisfactory.

In this connection, the practice of the Aberthaw Construction Co., Boston, is worth noting. In certain of the concrete buildings erected by this firm floors have been chipped in particular places because of some phase of the industry which gave rise to dropping heavy materials in one place, as, for example, the winding rolls in a paper mill. When a floor has become chipped out in some such manner as this, the proper method of repairing is to chip out with mallet and chisel a recess usually square, of sufficient depth to reach to the bottom of the deepest break in the concrete surface. The rough surface resulting from this process is then treated with acid to bring out the solid aggregate, or else a stiff brush is used to remove all the loose dust, and the recess washed out by sluicing out with a hose. When all the dust particles have been removed the recess is grouted with cement and before this has set the granolithic finish is applied and leveled up with the rest of the floor.

The Commission of Conservation has sent a bound volume containing two addresses delivered at the second annual meeting of the commission held at Quebec last January. These are, Agricultural Work in Ontario, by C. C. James, Deputy Minister of Agriculture for Ontario, and Unsanitary Housing, by Dr. Chas. A. Hodgetts, Medical Adviser to the committee on public health of the Commission of Conservation. The latter address will be read with interest by many readers of the Contract Record who appreciate the evils of improper housing and the deleterious effect of their continuance upon the individual. The housing question which is becoming of greater importance every year in Canada, has been more particularly brought to the attention of Canadians by Mr. Henry Vivian, M.P., the English expert. In this address the existing conditions in Canada are discussed, and some of the disclosures made should warrant careful investigation by our leading municipalities. The health laws of the various provinces are epitomized and their inefficiency is commented upon.

Construction of the Cambie Street Bridge, Vancouver, B.C. View of north steel trestle

The Cambie Street Bridge at Vancouver

The Longest Steel Structure of the Kind in British Columbia—Details of Design and Methods Employed in Erection of Substructure

Special to the Contract Record

The Cambie street bridge is the longest steel bridge in British Columbia, it being 3,390 feet between abutments. It comprises two viaducts, of plate girder construction, resting on steel columns, in turn resting on concrete pedestals which are supported by pile piers capped with concrete. Between these two viaducts and over the main channel is a 264-foot centre bearing, riveted Pratt truss drawspan. The north viaduct is level and the floor is fifty feet above mean tide. This level also carries the roadway over the C. P. R. tracks, thereby eliminating a grade crossing.

The tops of posts of the viaduct construction are flush with the tops of girders, and the latter button to diaphragms in the posts. The same rivets pass through the end flanges of both girders butting on the posts. The general arrangement of the span lengths are five 80-foot girders and a 40-foot in series. The bents supporting the 40-foot girders are braced longitudinally, making a tower which imparts longitudinal stability of the whole. This regularity of span lengths is not adhered to the shore on account of the crossing of the railroad tracks at the north end. The first 17 panels from the south end are 40 feet long, except those crossing a railway track which are thirty-five feet and the bents are skewed. Throughout the viaduct construction the main girders and posts are 24 feet, centre to centre, and cross girders are riveted to the main girders every twenty feet. On the outside of the cross girders, riveted to them through the main girders, and reinforced by cover plates over the latter, are cantilevered brackets, 18 feet long.

Parallel to the main girders are six runs of steel stringers, four between and under the street railway rails, and one on each outside, stiffening the cantilever brackets and carrying the load of the roadway. The tops of these stringers are crowned six inches and on these lie six by nine creosoted ties. On these ties are spiked four by twelve creosoted planks and on these are laid creosoted fir paving blocks. There are double street railway tracks spaced ten feet, centre to centre. On the ends of the ties are bolted the curb, four by ten creosoted timbers giving a roadway between of forty four feet. Outside of the curbs resting on the ends of the cantilevered brackets are 5-foot sidewalks of 2 x 12 untreated fir planks, supported by four runs of 4 x 12 fir joists. This sidewalk is built independent of the curbs, so that it can be renewed without disturbing them. There are steel hand rails in which, every eighty feet, are steel posts which carry the trolley wires and lighting brackets.

The trusses of the drawspan are twenty-four feet centre to centre, between which run the car tracks. There are cantilevered brackets outside supporting a 10-foot roadway and 5-foot sidewalk. The floor between trusses is paved. It affords a passage for swift moving vehicles such as light rigs and automobiles, while the slower, heavier traffic can take the outside roadways. The centre bearing drawspan, a newer type, is supported on a large casting at the centre of the pivot pier and is kept in balance by six wheels which run a track on the circumference of the pier. At the ends of the drawspan are massive collapsible gates hinged to bases of posts on the fixed construction. A smooth crossing at the ends of the drawspan is afforded by rail locks which are hinged to the rails on the viaduct so that they rise in a vertical plane be-

The lower bridge in right background is the old wooden structure erected in 1890. Upon the completion of the new bridge the old one will be demolished.

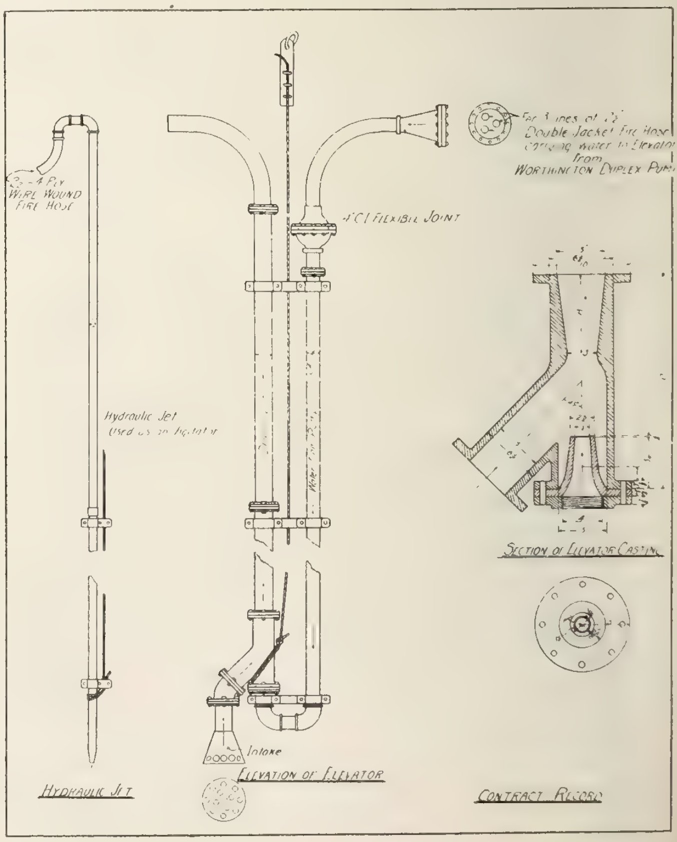
into the span is to be turned. These gates and rail locks are operated by small motors under the floor of the fixed spans, but controlled from a machinery house on the centre and top of the drawspan. In this house is the motor for drawing the wedges from under the ends of the span and turning it. Beside these end wedges, are two, one on each end of the centre bearing casting, which are worked simultaneously with the end wedges. These centre wedges insure a greater solidity and less vibration to the span when closed. The end wedges drive between the tops of the end columns of the viaduct and shoes under the ends of the draw span. The span is locked in place by a latch, which falls in a slot resting on a strut connecting the end posts of viaduct. The sides of this slot are held in place by strong springs which take up any momentum the span may have when closing to position.

Cambie Street bridge construction, looking north from south abutment

The approximate quantities in the superstructure are as follows; metal and machinery in drawspan, 450 tons; metal in viaduct construction, 3,200 tons; creosoted timber, 850 M., B.M.; untreated fir timber, 415 M., B.M.; pavement, 16,600 square yards.

The foundations are of three types, the most simple on shore where the earth was simply excavated to the hard-pan. The foundations of the pivot pier and rest piers of the drawspan were put in by the pneumatic process with which all are familiar. The supports of the steel trestle rest on the pile piers, that is, piles driven to refusal on the hardpan, or cemented gravel cribs sunk to a depth of about ten feet and filled with concrete which forms a cap of grillage to transmit the load from the concrete pedestals above to the piles. Piles were driven first, there being nine under each pedestal, spaced three feet centre to centre in each direction. The cribs or boxes made of 12 in. by 12 in. timbers laid horizontally, 14 feet by 14 feet outside measurement, were then built about the piles and held to position by guide piles which had been driven with the bearing piles. Each crib had fourteen courses of timber, secured by long bolts for cofferdams. The lower ends of the cofferdam bolts screwed into large nuts which were held by sockets cut in the top timbers, so that when the pedestal was completed the nuts could be taken off the upper end of the bolt. The bolts were then unscrewed from the lower nuts with a Stilson wrench, thereby releasing the cofferdam. The cribs when completed and ready for sinking were weighted with large granite blocks on the corners, from 30 to 35 tons being put on. Then the cribs were sunk by having the mud, sand and shells pumped out with the hydraulic elevator. (See plan of same).

In connection with the elevator, a water jet with same pressure as that on the elevator, slightly over 100 pounds per square inch, was used to cut up and place the mud in solution. In other words, it was used as an agitator. The elevator was placed about the middle of the cribs on the bottom and but seldom moved. The jet was moved constantly about. Care and skill were necessary to keep the jet at the proper elevation to get the best results. The jet was raised or lowered by a derrick in accordance with signals from the operator. As the material was removed by the hydraulic elevator the cribs sank and were put down to the first layer of crust or hard clay. When the cribs were sunk to this depth all mud was cleaned out and the first three to five feet of concrete, called the sealing course, was placed under water with excellent results. The mixture was one part of cement, two of sand and three of gravel—made very wet. It was dumped into a tremie, a heavy pipe about 10 inches in diameter with a hopper on the top. This hung from a separate derrick, the cable being attached to the hopper by means of a chain bridle spread sufficiently high to allow the concrete bucket to swing over the tremie. The batch would fill the pipe, and in order to get the next batch in it was necessary to raise the pipe about a foot. Then the concrete would run down the pipe. When low enough to allow another batch in, the tremie with hopper was lowered. In this way the concrete was never exposed to the washing effect of the water. After three days the water was pumped out and the balance of the concrete was deposited in the dry, after the sealing course had been cleaned of any scum or laitance. This was very little, sometimes amounting to about an inch and less. The footing, which covered


2½ - 4 Ply Wire Wound Fire Hose
For 3 lines of 2½" Double Jacket Fire Hose carrying water to Elevator from Worthington Duplex Pump
4" C I Flexible Joint
Hydraulic Jet Used as an Agitator
Intake
Hydraulic Jet
Elevation of Elevator
Section of Elevator Casting
Contract Record
Details of pumping apparatus used by contractors

the tops of the piles to a depth of about two feet, having been all placed, the form was placed and filled. The anchor bolts were set in the tops of all pedestals except those on which stood rocker columns. The forms were made with sides in separate pieces, but which fitted neatly at the corners. The sides were of 4-inch boards, 1¾ inches thick, tongue and grooved and dressed on the inside. These boards were nailed to 6 in. by 8 in. timbers at intervals of four feet. These girts were bolted together, the bolts being outside of the form. When a form was to be removed the bolts were loosened and the form removed as a box and placed in another crib. There the nuts on the bolts would be screwed up, making the form tight. To get a smooth finish the concrete was spaded along the sides of the form. The pedestals required no retouching worth mentioning when the form was removed.

Lowering last bent at north end draw span

Hydraulic Elevator in Caisson

As mentioned previously, pneumatic caisson work being so well known, it is unnecessary to touch upon it in connection with these bridges. It might be of interest, however, to mention a novelty—the use of the hydraulic elevator in connection with this kind of work. The hydraulic elevator (see plan) was operated by water fed to it from a large duplex pump at a pressure of 100 pounds per square inch at the pump. The first eight to ten feet of material to be penetrated consisted of soft mud, sand and broken shells, a material commonly ejected from a caisson by blowing it out through a pipe, counting for pressure to do so on the difference between the compressed air in the caisson and the normal pressure outside. For the first ten feet in sinking this inner pressure was very light, as there were only three or four feet of water at low tide. By attaching the elevator to the pipes in the caisson, which had been provided for that purpose, and by using water from the power scow employed in sinking the cribs, it was found that greater progress could be made, as the elevator would take out the material as fast as it was fed to it and could be worked continuously; whereas in depending upon the air pressure the air valves could only be opened intermittently on account of blowing off all the air. By a comparison of the two methods in caissons of equal size, 16 x 16, it was found that with the use of air pressure 123 cubic yards were blown out in 42 hours, as against 115 cubic yards in 19½ hours when the hydraulic elevator was used. The latter threw out nearly double as much as the former. No trouble was experienced by the air escaping with the water, as one might suppose. When not ejecting, a target or wooden board was kept over the end of the suction and the water from the pump simply allowed to enter and leave through the pipes.

The following quantities are in the substructure: concrete in abutments, 3,990 cubic yards; concrete in bases of pedestals, 3,670 cubic yards; concrete in shafts of piers and pedestals, 3,300 cubic yards; mass of foundation of pneumatic piers, 2,440 cubic yards, piles below cutting edges of cribs, 3,600 lin. feet.

The amount of the substructure contract was about $210,000, and that for the steel work, $440,000.

The engineers who designed the bridge and under whose supervision it is being built, are Waddell & Harrington, with Mr. C. P. Moss as their resident engineer. The contractors for the substructure are Palmer Brothers & Henning, of Vancouver, and the Canadian Bridge Company, of Walkerville, Ont., are furnishing the steel and erecting it. Their plant is as complete and labor-saving as can be made.

For complete description of the Granville street and Westminster avenue bridges, both of which were also designed by Messrs. Waddell & Harrington, see Contract Record, March 8, 1911.

Cementation of Wet Ground

A most interesting method used in connection with shaft sinking or tunneling through water-bearing ground has been developed in the Pas-de-Calais coal district of France, which is termed "cementation." The coal measures of the district are overlain with bedded marls and chalks, more or less fissured, and the fissures in some places are so filled with water that ordinary methods of shaft sinking would fail. Heretofore, the freezing system has been successfully used, but the new cementation method can be employed at less cost. In one instance, the cost of cementation through 343 ft. of water-bearing ground was $13,200. Briefly, the process used by this company is to drill a set of holes in the water-bearing ground, six in number, arranged in a circle, surrounding the site of the proposed shaft, and then to pump a cement grouting through the holes until the fissures and interstices are filled. Shaft sinking is then proceeded with as it would be through ordinary rock strata. The system seems applicable to many situations where water is encountered in either shaft sinking or tunnel driving in broken hock.

During the first five months of 1911 the building permits issued at Toronto recorded an increase of nearly two and a half million dollars over those for the corresponding period of 1910, the figures being respectively $9,555,513 and [illegible]. The total for last month was [illegible] compared with [illegible] for May, 1910.

Use of Concrete in Highway Construction

Principles Underlying the Best Work—Practical Directions: Ample Drainage Essential Cost of Tarring and Sanding—Importance of Surface Treatment*

By W. A. McLean, Provincial Engineer of Highways for Ontario.

Modern use of concrete in highway work includes many details. It is largely used for pavement foundations, sidewalks, bridges and culverts, bridge abutments and retaining walls, bridge floors, curbs and gutters, man-holes, catch-basins, hand-rails, and other special features. Its use for much of this work is so well-known and has been so frequently written about, that to attempt a complete description would be to repeat largely what has been already well said. There are points, however, upon which progress is being made, or with regard to which some problem remains unsolved, and which are therefore deserving of comment.

Concrete has become the recognized foundation for asphalt, brick and other high-class pavements for streets of towns and cities, and for the foundation of such brick pavements for country roads, as those largely used around Cleveland, Ohio, in Cuyahoga County. Its use as a paving material for the surface of the street or road has, however, been looked upon with considerable uncertainty, although in a number of cases, some degree of courage has been shown in carrying on this class of work.

Favorable Reports from Windsor, Ont.

Windsor has been the principal place in Ontario to adopt this type of paving, and reports as to its merits have, to the present, been favorable. Experimental blocks have been laid in Brantford, Chatham, Toronto and other cities.

Recently the good roads movement in Michigan, as carried on in Wayne county, surrounding the city of Detroit, has led to the adoption of concrete for the country road construction. These roads are characteristic of main highways radiating from a large city. Requirements of this traffic have led to the adoption of a type of roadway consisting of a central concrete pavement from 10 ft. to 18 ft. wide. On either side of this are gravel or macadam shoulders making a road of the desired width, usually from 24 ft. to 30 ft. from outside to outside of gutters. The first of these roads, two miles in length, was built in 1909, and was found so satisfactory that in 1910 about 15 additional miles of this work was completed or begun. The cost has varied according to local conditions, but including shoulder, drainage, and culverts, has been approximately $1.35 a square yard of concrete.

Process of Construction

Concrete pavements are laid in much the same way as concrete sidewalks. The sub-grade is excavated and rolled. This should be carefully done so that the monolithic pavement will have a base of uniform strength. If the sub-soil is of sand or gravel, the concrete may be laid directly on it, but if it is clay or other impervious soil, it should have a layer, three or four inches thick, of gravel, cinders, broken stone or other strong and porous material. The sub-grade should have the same camber or crown as the finished roadway is to have. If a town street, curbs are laid first; but is a country road, curbs are not used, the surface being merged into the gravel or macadam shoulders.

Over the sub-grade the concrete base is spread, to a depth varying with the amount of traffic, usually 4 in. to 6 in. The mixture should be proportioned for greatest density but common practice employs a 1:3:7 mixture of cement, sand and broken stone; or a 1:8 mixture of cement and gravel. The base should be immediately covered with a wearing surface of 1½ in. or 2 in. thick of strong mortar or concrete.

At intervals of about 25 ft. there should be expansion joints across the roadway, about ½ in. wide; and at the curb similar longitudinal joints, to be filled with pitch or asphalt.

To attain good results, the greatest care must be taken in particulars now well known in paving and general concrete construction. As with any form of road construction, drainage should be ample. The surface coat should be immediately spread on the base before the latter has commenced to harden so that union will be complete. A well rolled and uniform foundation will prevent much cracking. Mixing of the concrete should be thorough, as imperfect mixing is the cause of a vast amount of poor concrete. The surface should be protected from the sun in the usual way with straw, sand, burlap, and should be kept moist until it has fully hardened. As a rule, a concrete road or pavement should not be opened for traffic in less than ten days or two weeks.

A perfect pavement, meeting all desirable conditions of cost, durability and service rendered has not yet been found; and as requirements in many cases are of an opposite character, it is not probable that a pavement ideal for universal use will ever be invented. The more important qualities usually sought in a pavement or road material are that it should be:

(1) Low in first cost.

(2) Easily and cheaply maintained.

(3) Smooth and hard, so as to offer least resistance to traction.

(4) Easily cleaned.

(5) Noiseless.

(6) Not producing dust and not muddy.

(7) Non-absorbent and sanitary.

(8) Such as to give a good foothold for horses.

(9) Comfortable for those driving on it.

(10) Neither glaring nor hot.

The principal objections to concrete as a material for roads and pavements have been that the surface is too hard and glassy to give a proper foot-hold for horses; that it is rigid and therefore hard on the feet of horses; that it reflects heat and has an unpleasant glare; that expansion joints chip at the angles and under constant traffic deepen to holes; that cracks due to defective construction and to uneven foundations are difficult to repair, and, like expansion joints chip at the corners.

---

* Before the Canadian Cement and Concrete Association.

Satisfactory Experiment at Ann Arbor

On the other hand, it has been recognized that were these difficulties overcome, concrete has certain merits.

My attention has recently been drawn to the concrete pavements of Ann Arbor, Michigan, which have been treated with a surface painting of tar over which a thin layer of fine gravel is spread, just sufficient to be saturated and held by the tar.

These pavements are constructed in the usual way by the mixing process. They consist of a bottom layer of concrete 5 ins. thick, composed of one part Portland cement to eight parts of sand and gravel, and a top layer of Portland cement mortar 2 ins. thick, made in the proportion of one part of cement to two parts of sand. An expansion joint 1 in. wide is left at each curb, and an expansion joint about ½ in. wide each 20 ft. transversely of the street. After the concrete has partially set and is dry, there is spread a thin coating of hot coal-tar or distilled coal-tar, and before this is dry it is covered with a uniform layer of sharp sand. The transverse joints are filled with a mixture of pitch, or tar and sand, care being taken to fill the joints flush with the surface of the pavement.

In 1909, 1,883 square yards of this pavement were laid and in 1910, so satisfactory was the experiment, that there were laid 18,223 square yards while petitions have been received for over 70,000 square yards to be laid this year.

For applying the tar, a steel tank holding about 450 gallons is used, under which is a fire-box for heating the tar, and to the rear is a 2 in. gas pipe used for sprinkling the tar. When tar has been sprinkled over the pavement, a rotary sweeper is driven over it which distributes the tar uniformly over the street. The sand, which is passed through a ¾ in. screen, is then spread by a wagon having a triangular box 5 ft. long on the rear. Near the bottom of this box is a 2½ in. curved shaft, belted to the hub of the wagon. As the shaft revolves, the sand is put on a screen and by the time it reaches the pavement, is nicely spread.

In appearance, these pavements resemble sheet asphalt, the tar and sand coating overcoming the glare and reflection of heat. The tar and sand fill the expansion joints and depressions, serving as a wearing surface. The expansion joints disappear from view and do not chip at the corners. The tar-sand coating deadens the noise of traffic and makes the pavement impervious to moisture. If cracks appear they are painted with tar and sanded so that they, too, disappear and they do not crumble under traffic. The treatment, in short, overcomes the more objectionable features of the concrete pavement.

Tar pavements as heretofore laid in Ontario have cost about $1.15 a sq. yd. The tar treatment in Ann Arbor has cost 2 cents a square yard, and the treatment has been found to last for two years, making the cost of tarring and sanding 1 cent per square yard per annum. If further experience shows the success of this treatment, it should prove a boon to the smaller towns and villages in paving their main business streets. It should be useful for residential streets in large cities and would be exceedingly effective for main roads adjacent to large cities.

On the New York State highways an experimental road was last year built near Rochester of concrete cubes in a manner somewhat similar to the German "Kleinpflaster," and to the "Durax" roadway of England. The New York cubes are two inches square, of gravel or stone concrete, and are turned out by machine. The road is first constructed with a good stone foundation; or, if an old macadam road, is reshaped and crowned. The cubes are hauled and dumped like ordinary road material, but are spread uniformly by hand. They are laid in a sand cushion, sand is swept into the joints, and they are then well consolidated by rolling. The cost on the experimental section was 50 cents a square yard or equal to the cost of a bituminous binder. The appearance when finished was very satisfactory and it is hoped that the method will be found adequate for the requirements of rapid motor traffic, including resistance to wear and freedom from dust.

Concrete pavements, in addition to the mixing process, have been laid by a patented grouting method. A body of broken stone is first put down, rolled to place, and then flushed with a thin cement grout and rolled until consolidation is complete. By another process, not patented, the cement, sand and stone have been mixed and spread dry. This is spread to grade, rolled to place, then sprinkled and rolled until consolidation is complete and setting has commenced. It is doubtful that either of these processes meet the requirements of thorough mixing, essential in making good concrete.

Concrete in Bridges

Concrete has by no means displaced steel for bridge construction, but that each has its place is the consensus of opinion reached by bridge engineers. The field of concrete bridges, reinforced with steel, is largely confined to spans up to 50 feet—where either flat or arched design may be employed. Concrete arches are commonly applicable to situations up to 100 ft. or 125 ft. span, provided there is sufficient rise, but the use of arches is in all cases restricted to situations where the abutment foundations are strong and unyielding. For spans up to 50 ft., flat-top concret bridges with vertical reactions are suitable for situations where the arch could not be employed, but even here a stronger foundation is essential than would be required in the case of a steel truss bridge. Slight movements of the abutments are ruinous to a concrete arch; are permissable to a slight extent with flat or beam concrete bridges, though to a less extent than would work serious injury to a steel truss.

Temperature stresses have been one of the serious difficulties in the design of concrete bridges. For short spans up to 50 ft., these may be disposed of by the use of steel, well distributed through the concrete. The amount of steel required in an arch will of course depend upon the design of the arch, but in a general way one per cent. of steel is required to take care of temperature stresses, particularly in spandrel walls. For longer span bridges, expansion joints become necessary in the spandrel walls over the haunches and at the crown. These are objectionable in several ways. They weaken the bridge, but it is chiefly as has the appearance of a crack, and creates a feeling taken. To the user of the bridge, the expansion joint regards the appearance to which exception can be of distrust in the strength of the bridge. These expansion joints are usually filled with asphalt or pitch to keep out moisture, but this treatment does not con ceal them and some other means of dealing with this detail of bridge construction would be welcomed by engineers.

There is a tendency to improve the appearance of shorter concrete bridges by the use of ornamental hand- rails. This is desirable, but failure frequently occurs through neglect of temperature stresses. Open rails should be broken into lengths of 8 ft. to 10 ft., giving expansion joints and the ends of each span supported on a post. Between the posts, spindles of various types may be used. The writer has seen a bridge of over 100 ft. length in which much attention was given to appearance, but the hand-rails were not given expansion joints and every spindle in the bridge had been sheared.

In the design of concrete arches, there are architectural details too often overlooked. The parapet or coping should be slightly arched, otherwise it will look concave. The wing walls should not be straight but should be if possible slightly curved, as otherwise they look weak.

Importance of Surface Treatment

Surface treatment of concrete is all important The surface should be a part of the concrete itself. A mere plastering of a defective surface will not permanently remedy the defect. In securing a good finish, the frame-work should be dressed and closely fitted. The concrete mixture should be wet; should contain sufficient sand and should be carefully spaded against the form work so as to avoid airholes and cavities. A good finish can be obtained by using fine granite in the surface mixture, this to be treated with acid or brushed with wire before the concrete has fully set. This treatment is not practicable except for special work, but in all cases a smooth and close-grained surface can be obtained by using sufficient care. The practice of making the exposed surface of stronger concrete is good, and is readily accomplished by carrying up a board a few inches inside the surface to retain the core concrete until it is partially set, when the board can be removed and the surface concrete put in place.

A common fault in short span country bridges and culverts is that they are too short. As a rule it will be found as cheap to carry tile entirely across the road using shorter head walls and widening out the fill, than to use a shorter length of tile with necessarily higher and longer head walls to retain the earth fill. Short span bridges on country roads should always have a width of at least 20 ft. to accommodate traffic. It is an improvement in the appearance of such short bridges to extend the wing walls almost straight, carrying them to the top of the roadway and putting on a suitable hand-rail. The public sees little but the hand-rail of short bridges, and if it is strong and of a good appearance is impressed by it. A bridge need not be ornamented, but is often a chief feature of the landscape and should not disfigure it. It can be made ornamental, and certainly ought to be.

Bricks in street gutters in Chicago have been set in courses at right angles to the curb according to the observations of Mr. Samuel Whinery. In his report to the commission on city expenditures he states that if a strip 12 to 14 inches wide be set in each gutter parallel to the curb the rapid flowing away of water from the gutters is facilitated.

Maintenance of Macadam Roads

The Edinburgh county road surveyor gives the results of his observations in England and his experience in Scotland with respect to the use of tar and pitch as binding materials for stones used in making and repairing roads. The four methods of applying tar are: (1) Tar spraying; (2) tar macadam; (3) pitch grouting; (4) tar matrix.

The above methods and cost per superficial yard over ordinary macadam, detailed by the county road surveyor, are here summarized:—

Tar Spraying—It is essential that all dust and caked mud be removed from the road before the liquid is applied. After tarring, a slight sprinkling of whinstone screenings is spread over the surface. Hand tar spraying is considered superior to machines, although it costs slightly more and takes longer. In this process tar is not so much a binder as a waterproof protection to the road surface. It is soon worn away, however, and when broken up the road is thrown into an uneven and dirty condition. It is now admitted that tar spraying lasts only for one season. The life of a road subjected to much fast motor-car traffic is increased 15 to 20 per cent. when tar sprayed. One of the main thoroughfares in Edinburgh county cost on an average $1,460 per mile per annum to maintain as at present. If tar sprayed its whole width the cost would be $1,800 per mile, after allowing for the increased life of the road, as above indicated.

Tar spraying is most suitable for county roads where expenditure is limited, and although tarring the entire surface would be preferable, a width of 10 to 12 feet in the centre would accommodate motors and protect the metal bed, allowing at least double the length being sprayed, and leaving the sides with a better foothold for horses during frost.

Tar Macadam—This consists of thoroughly mixing the stone with tar and pitch previous to its being laid on the highway. All stones should be dry, which necessitates preparation of the material under a coverer structure. Tarring may be done by hand or machinery. It is usual to allow the material to lie in heaps one to three weeks to mature before applying. The coatings are applied in three layers of 2½ and 1½ inches and ½ inch stone, rolled separately, and finished with a thin layer of fine dry screenings. Tar macadam roads are easily cleaned, and the cost of maintenance on an average of years is less than ordinary macadam. It is slippery during frost and unsafe on gradients steeper than 1 in 20. Under very heavy traffic it loses its bituminous surface in two or three years, and the top layer becomes separated from that below. This system involves a comparatively heavy initial expenditure, and its general adoption on county roads would appear to be impracticable.

Pitch Grouting—This consists of application to a scarified road, rolled smooth, of a three to four inch coat of whinstone metal, consolidated in a dry state, after which boiling pitch and tar is poured into the joints, sprinkled with small whinstone or limestone gravel, and rolled until thoroughly hard. The composition is made up as follows:—Pitch (best coal tar) 1,100 pounds; refined tar, heavy bodied, 800 pounds; creosote oil, 100 pounds; total, 2,000 pounds. The mixture is applied to the roads at boiling point with spray cans, whinstone chips are immediately applied, and rolling at once undertaken. This composition is of a quick-setting nature, but retains considerable viscosity. The surface must be thoroughly dry before it is applied. The surface is smooth, but not slippery. The traffic is carried on the metal and not on the tar, as is the case with tar macadam, tar painting, or tar matrix. This is regarded as the best system for taring county roads, as it makes them almost dustless, effects a great economy in cleaning, is easily repaired, and the life of the road is increased at least one-third.

Tar Matrix—There are three methods of applying tar matrix. It is unusual to slightly scarify the exising road surface. The first is to spread a layer of small gravel, previously tarred, to a depth of one inch to 1½ inches, on which is laid ordinary road metal. This is rolled until the matrix is forced to the surface. In the second the road metal is spread first and well rolled in the dry state before the matrix, composed of tarred materials up to one inch in size and to the foregoing depth, is applied. This is rolled until the interstices are filled with the matrix and a smooth surface has been obtained. A thin finishing coat of finer tarred materials is usually applied, sprinkled with dry sand or chippings, and rolled until thoroughly hard. The third or Gladwell system is a combination of the first two, having a matrix both above and below the metal.

Rocmac—Roads made on the Rocmac system are claimed to be dustless, waterproof, economical, durable, and non-slippery. The solution is a chemical composition, made under pressure, the foundation of which is silicate of soda and sugar. The solution is mixed with high-class ¼-inch limestone and gravel free from impurities. This is laid about one inch to 1½ inches deep on the road surface, which has been slightly scarified. On this is spread the ordinary macadam metal, about three inches thick, and thoroughly rolled until the matrix entirely fills the interstices and comes to the surface. Owing to the simple preparation of the matrix and small plant required, the work can be undertaken by ordinary workmen, but experiments have proven expensive compared with pitch grouting.

In Scotland as well as England, county road boards have experimented with tar macadam in constructing new roads, and maintenance of old have practically abandoned it, the cost being prohibitive. Tar spraying of 10 to 12 feet in the centre is generally regarded as the limit of economical treatment of macadam roads in outlying districts, and this has been restricted to main thoroughfares and of village roads. For suburban roads it is likely that the use of pitch grouting will increase.

Manufacture and Consumption of Cement

The table below shows the increase in demand for cement and the way in which Canadian production has overtaken and surpassed the import from the outside. It is taken from Mr. Richard Grigg's report on Canadian import trade.

Year		Cement manufactured in Canada	Cement imported into Canada	Cement consumed in Canada
1904	barrel	908,990	784,630	1,691,988
1905	"	1,541,568	917,558	2,264,106
1906	"	2,152,562	666,911	2,786,60[illegible]
1907	"	2,491,513	672,630	3,108,22[illegible]
1908	"	3,495,961	469,049	3,1[illegible]

The Winnipeg building permits last month broke the record of $2,104,480, established in May, 1910, by $125,000. The total for last month was $2,229,480, representing 564 permits. The figures for the first five months of 1911 are $5,791,230, compared with $7,492,400 for 1910.

The largest and costliest public work now in progress in Vancouver is the Cambie street bridge, a sister to the Granville street bridge. This huge high-level steel structure was commenced last year and will not be completed until next August. The bridge was designed by Messrs. J. A. J. Waddell and John L. Harrington, who are invested with supervisory jurisdiction until the city takes it over from the contractors. The dimensions of the bridge may be briefly pointed out. The length over all is 3,395 feet. The approaches in addition, at the north and south ends, will be about 3,000 feet. The roadway will be block

The extraordinary resistance of reinforced concrete to violent shocks is shown in a recent article in Ferro-Concrete on the Lievin experimental gallery for investigating coal-dust explosions. Another striking instance was furnished by the explosion of two gas storage drums at the reinforced concrete factory of the Prest-O-Lite Company, Indianapolis, resulting in practically no damage to the building where the explosion occurred, but which brought down the roof of a building 25 feet away, and cracked the walls of another building 100 feet distant. In the reinforced concrete building, the only damage consisted of a hole in the roof the size of the drum base, and work was resumed half-an-hour after the explosion occurred. The necessary repairs were readily effected by bending back the reinforcing bars and covering them with concrete.

Medicine Hat is forgingadead as an industrial centre, due, of course, to the great supply of natural gas at hand. Such industries as glass factories and steel plants find natural gas a splendid fuel for producing the intense heat required by such industries as these, and low cost is, of course, a great attraction. Bylaws passed last week grant a free site and 250,000 cubic feet of gas a day to a glass factory which will employ 150 hands and like concessions to the Alberta Foundry and Machine Company. In all, twelve new industries have been located at Medicine Hat, or are negotiating for locations, since the first of theyear.

The Grand Trunk Pacific railway will build 615 miles of new lines in the west this year. Much of this new trackage will be in Saskatchewan, important lines being those from Regina to Moose Jaw, seventy-two miles of the Prince Albert branch, the line from Regina to Griffin and the Battleford Oban branch.

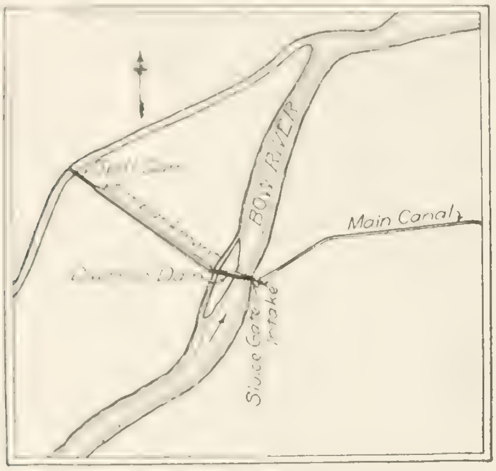
Exceptional building activity is reported from New Westminster, B.C. Among recent permits may be mentioned that for the Westminster Trust Block, which will cost $150,000. The buildings in course of erection include a new $100,000 tram station for the B. C. Electric Railway and a $45,000 warehouse for the Kelly-Douglas Company. There is an unprecedented amount of business in residence work.

Cleaning catch basins at St. John, N.B., during 1910 cost 95 cents per cubic yard of material, according to the last annual report of Mr. William Murdoch, city engineer. The total number of cleanings was 4,018, making 1,[illegible] cubic yard

A Great Irrigation Project in the West

Constructional Features of Important Development Undertaken by the Southern Alberta Land Company—Progress and Details of the Work

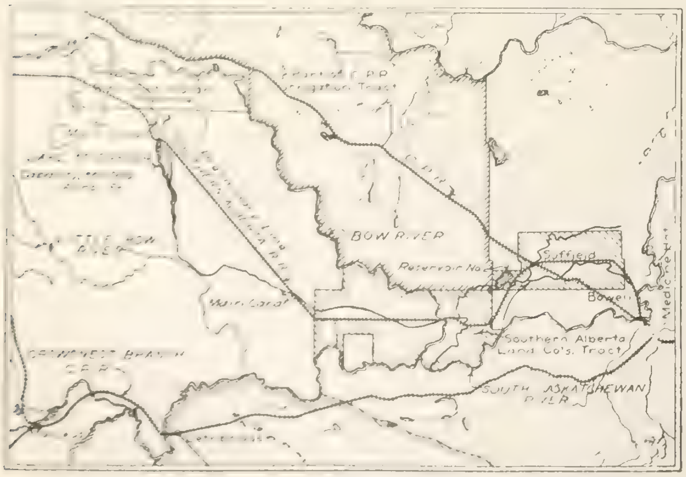
An irrigation project near Medicine Hat, which includes 200 miles of canals, a 360,000 acre-ft. reservoir 47 miles from the source of supply and about 45 miles from the land to be watered, intake works and a 2-mile siphon under 200-ft. head, is now about 50 per cent. completed, and will be ready to deliver water to part of the land next season. The object of the development is to provide water to irrigate about 60 per cent. of a 500,000 acre tract lying on both sides of the Bow river, west of Medicine Hat and north of the South Saskatchewan river.



Sketch of Dams at Main Intake.

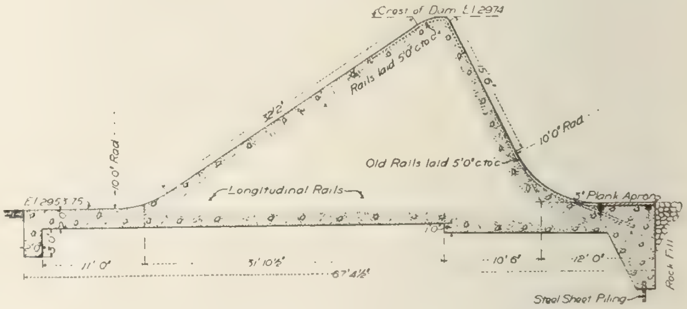
As the land to be reclaimed lies upon a plateau well elevated above the river, which flows on a low gradient through a deep and comparatively narrow valley, the diversion of water presented many natural obstacles. The wide walls of the valley are high and rather steep, and in many places are cut by deep and precipitous drainage channels. To avoid a high bank five miles below the intake, the canal line is diverted to a deep cut leading from the river to the channel of lateral drainage valley. Between this point and the storage reservoir there are two deep and important crossings of East and West Arrowwood Creeks.

A great natural depression, twenty miles long and from one-half to two and one-half miles wide, has been used to create a storage reservoir in which the flood waters of the Bow river can be stored and drawn upon for irrigating purposes whenever required. Emerging from the reservoir, the natural drainage is southerly toward the little Bow river, but its elevation is high enough to permit the projection of the canal along the eastern side wall, finally reaching out upon the summit commanding the plateau on which is located the land to be irrigated on the west of the river. To reach the land on the east side of the river, it is necessary to continue the canal along the summit on the west bank, and to cross by an inverted siphon. Some twelve miles from this point a second reservoir of 10,000 acre-ft. capacity provides additional storage for the lands east of the river.



Map Showing General Layout of Irrigation System.

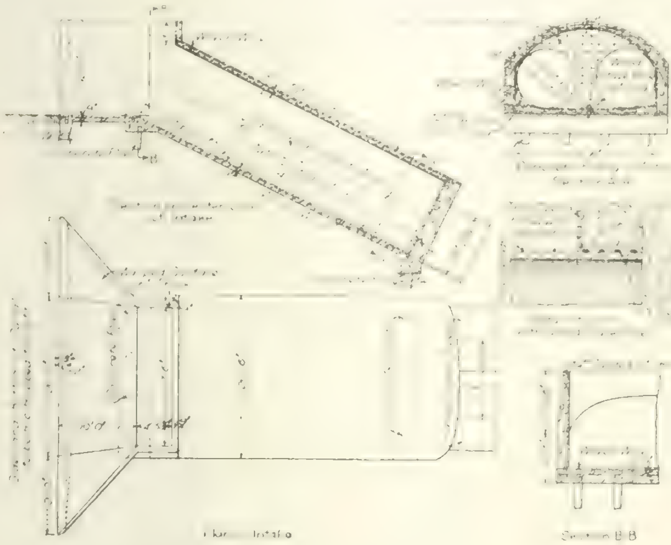
Water supply.—The source of the supply is the Bow river, which heads in the Bow and Coldwater Lakes at the head of the Bow Pass. The river has a well-sustained volume of discharge year to year, due, it is said, to its being dependent less upon annual snowfall than upon the glaciers and the regulating influence of the lakes at its head. The hydrographs taken at Calgary for the years 1897 to 1900, inclusive, show a range of less than one foot in the normal maximum discharge level for those years, omitting an unprecedented flood in 1897, which continued for only three days. It is to be noted that the period of maximum flow, being the period of highest temperature, comes at the same time as the greatest demand for irrigation water. Not many records have been taken, but an average of about 10,000 sec.-ft. represents flood conditions in June at Calgary and about 2,000 sec.-ft. the minimum flows from September to April. A single prior license grants 3,000 sec.-ft. of water to another company. The margin between this and greater flows available for the use of this company is still further augmented by the storage capacity in the reservoir.



Cross Section of Diversion Dam at Intake of Main Canal.

Duty of Water.—Under the terms of the land grant, the duty of water is prescribed at 150 acres per second foot. This is equivalent to an annual precipitation of 18 inches in addition to the natural rainfall of about 9 inches during the months of May, June, July and August, making a total of 27 inches from which it was estimated that there should be deducted twenty per cent. for evaporation and transportation losses. The irrigation period has been taken at 184 days, during which the continuous flow of one cubic foot per second would amount to 368 acre-ft. If this were spread over 150 acres, it would represent a depth of 2.4 feet. These assumed figures are given, as upon them is based the carrying capacity of the canals in the system.

The main structural features of the project are the intake, the deep cut emerging from the river valley, the crossings of the two Arrowwood Creeks, Lake McGregor and the inverted siphon crossing the Bow river. The dam is in three sections, a concrete structure in the form of a low diverting weir in the main channel, 530 feet long; an earth embankment, 1,800 feet long, and a 526-foot concrete structure similar to the first mentioned, across the minor channel on the east side, which will act as a spillway. The crest of this concrete structure across the minor channel is ten feet above the bed of the canal and the crest of the embankment eleven feet higher than the main spill dam and finished twenty feet wide on top. It is built of earth, and has downstream slopes 2:1 and upstream slopes 3:1, rip-rapped with boulders. The overflow dams are designed to take a discharge of 118,000 sec.-ft., 54,000 sec.-ft. being the highest recorded flood.

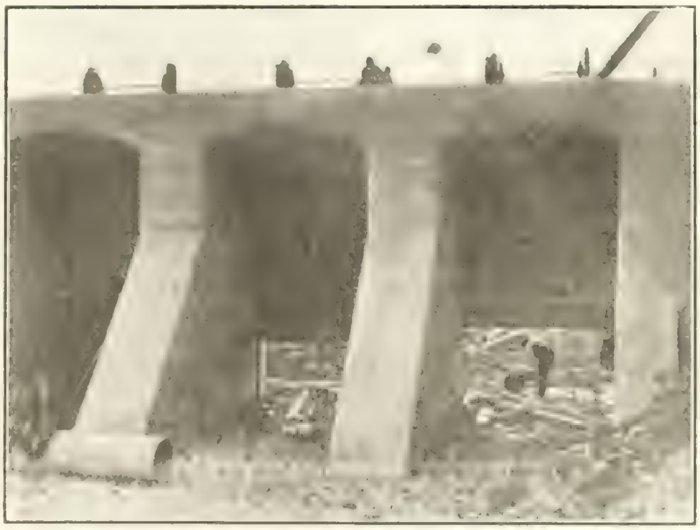

Intake of the Wood Stave Siphon.

The concrete section of the dam is reinforced longitudinally with six old rails to take care of shrinkage and temperature cracks. As a protection against the action of the ice, rails are placed over the crest and at the toe, as shown in the drawing. Sheet-steel piling was driven in a trench under the toe and then concrete placed over the top of the piles to prevent undermining. The concrete apron is overlaid with 3-in. plank, drift-bolted to timbers laid in the concrete to take the impact of the ice. The head gates are set in a reinforced concrete structure and are provided with fenders.

Feeder Canal.—Leading from the diversion dam to Lake McGregor, the inlet canal has a cross-sectional area of 350 square feet, and is designed to carry 1,035 sec.-ft. of water. The ruling gradient is 1.056 feet per mile, with additional head for flume and siphon crossings. The elevation of the bed of the canal at the intake is 135 feet above the elevation of the outlet of the lake. The length of the canal line is 50.76 miles. In the fifth and sixth mile from the intake there is a section 8,800 feet long in which the cut runs from 40 to 64 feet deep. The excavation work at this point was accomplished by 100 teams and three steam shovels furnished by the Atlantic Equipment Company, which loaded the material onto standard gauge flat cars. The canal has a bottom width of 25 feet and side slopes of 1.5:1, up to the high-water line, and 1:1 above this. As the material encountered was hard clay, the steepening of the canal slopes above the water line not only effects a considerable saving in excavation, but it is said to be the experience with cuttings of this character in the stiff clay slopes prevalent in Alberta that a tendency to slumping can only be corrected by cutting the slopes as nearly perpendicular as possible, thus avoiding the lodgment of snows in winter and the consequent softening and sliding after thaws.

In distributing the gradient throughout the length of the feeder canal, numerous deep cuttings occur in the first 25 to 30 miles, and to avoid as much of this as possible, the gradient was kept up until this section of the country was passed, which occurs in the thirty-first mile. Nearly all of the surplus gradient was thrown into the section between the above named point and the lake, which resulted in the establishment of a grade of 2.64 feet per mile, with 9.25 feet extra elevation above the present high-water line of the reservoir, which will be available for further increase in the storage capacity of the lake, without interfering with the free flow in the canal. On this lower section the canal is 15 feet wide on the bottom, has an 8-foot depth of water and sides cut to the slope of 1.5:1, as in the first section. This provides a carrying capacity of 1,055 sec.-ft., with a velocity of 4.55 feet per second; but as this is merely a transportation channel, it is not considered that such erosion as may take place will involve any real injury to the canal.

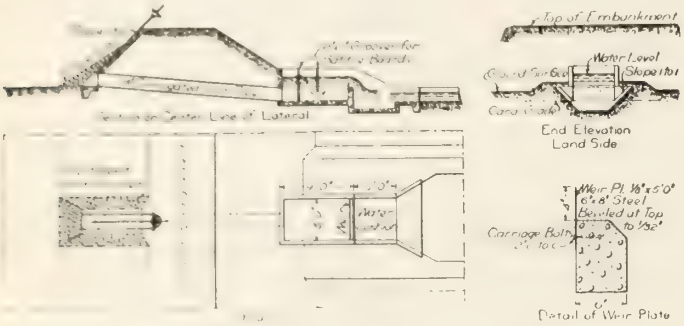
Inverted Siphon.—The East Arrowwood crossing consists of two wood stave pipes 7.5 feet in diameter furnished by the Pacific Coast Pipe Company, Seattle. The two ends are practically identical reinforced concrete structures, and only the intake is shown. An alternative design of following up and down the steep side walls of the valley for a total distance of three miles and spanning the channel proper by a low flume, 1,800 feet long, was at first laid out, but abandoned as being more expensive, not only for first cost, but for maintenance and operation, than the inverted siphon finally adopted. The intake and outlet of the


View of Intake from Canal Side.

siphon are built wholly in excavation, and the foundations carried down to material firm enough to carry the load imposed. In order to lose as little head as possible, the entrance is made by a flaring inlet, having warped surface sides, which change the canal section of 350 square feet to the 146.7-ft. arched conduit section at the end of which the water enters the two wooden stave pipes, having a combined area of 88.3 feet.

The West Arrowwood Creek crossing is an overhead wooden flume supported on pile trestles having a maximum height of 45 feet. This flume has a sectional area of 160 feet and the velocity will be 6.4 ft. per second. A head of about 0.5 feet will be lost in the 1,056-foot length.

The necessary works to convert Snake Valley, as it was locally called, into a storage reservoir, renamed Lake McGregor, consisted of earthen embankments at either end, having lengths of 3,600 and 2,100 feet and heights of 48 and 46 feet respectively. These dams are 23 feet wide across the top and rise to an elevation 10 feet above high-water line, which is 30 feet above the outlet level. The inner slopes of the dam are to be faced with an 8-in layer of concrete cut up into 16-ft. strips by expansion joints running up the slope. As a further measure against cracking, the concrete will be reinforced by 4 x 8½-in. woven wire placed close to the under side of the concrete. The concreting terminates at the base in a vertical wall of the same thickness as the facing, which extends two feet below the toe of the dam.

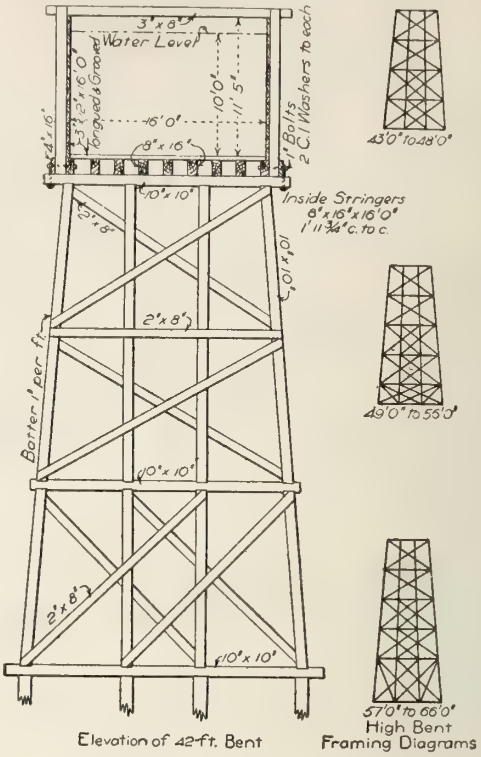


Intake Works for Distributing Canal.

The outlet works consist of a reinforced concrete gate tower, an outlet culvert through the dam, and buttressed wing walls leading to and from the above structures. The two gate outlets are located at the upper end of the outlet culvert and are provided with two 5 x 10-ft. sluice gates built by the Ransoms-Rapier Company, of London, England. To prevent erosion of the bottom of the inlet and outlet, the space between the abutment walls is riprapped and grouted.

About five miles away from the lake outlet the side walls of the Little Bow River are encountered, and from here on the canal will lie upon steep slopes for about eight miles. This canal, up to where it forks just west of the company's tract, will have a capacity of 1,900 sec.-ft., and a bottom width varying from 30 to 40 feet, dependent on the gradients due to the slopes of the country. The 85 miles of canal between Lake McGregor and the Bow River siphon contain eight reinforced concrete drops and one flume 4,600 feet long. A typical head gate for distributing canals, having capacities of from 15 to 20 sec.-ft., is shown, in which steel measuring weirs, 5 feet wide, are placed on the land side of the embankment.

The spillways in the main canal are reinforced concrete structures built in the embankment and provided with 5 x 6-ft. steel sluice gates, built by the Western Steel Headgate Company, of Denver, Col. At creeks crossed by wooden flumes three steel sluice gates, 4 ft. 8 in. x 6 ft., built by the same company, are provided in the side of the flume through which the water is delivered to the flaring outlets which carry the discharge away from the base of the trestle.



Flume for Coulee Crossings.

Bow River Siphon.—About 120,000 out of the 300,000 acres of irrigable land in the project are located on the east side of the Bow River. For full development this will require 800 sec.-ft. of water, which is to be carried across the river in a wood stave conduit eight feet in diameter supported on a bridge, the type of which is not yet determined, but to be designed for the accommodation of a roadway. The total length is 6,300 feet, and the pipe will be under a maximum head of 200 feet.

As to progress in the work, the dam, intake structure and embankment across the island have been completed at a cost of about $150,000. The 46-mile canal, involving 3,500,000 cubic yards of excavation, and the dams at the north and south ends of Lake McGregor, containing 300,000 and 130,000 cubic yards of material, respectively, have been finished. Four hundred teams are now at work on the first 14 miles of outlet canal along the banks of the Little Bow River, where the cuts run up to 60 feet. The line from the Little Bow to the Bow River siphon is covered with men and teams, with the expectation of completing it in time for irrigation next season. The East Arrowwood crossing, flumes, intake wasteways and outlet from Lake McGregor were constructed by the Carter-Halls-Aldinger Company, Limited, of Winnipeg. The remainder of the work is being done by the J. D. McArthur Company, also of Winnipeg. Mr. Arthur M. Grace is chief engineer for the Southern Alberta Land Company, Limited, and Mr. James D. McGregor, of Brandon, Man., is managing director.—Engineering Record.

Economies in Future House Construction*

By Hilder Daw, New York City

Economies in future house construction are engenerative in various classifications: Wages, weight, competency, values and innovations.

Wages: Within the last twenty years we have seen the growth of trades unionism rising from an ethical argument into a controlling and uncontrollable force. The time must come when contractors will receive as well as be compelled to give, equitable returns for specie.

Weight involves expense in every direction. Values, haulage, freightage and handlings are based upon our scales; therefore relief must be given by re-inforcements in all productions, whether in sewer pipes, steps, slabs, beams, walls or components. Perishable timbers will be replaced by reinforced concrete members whose specific gravity will be counterbalanced by their minor proportions.

Competency: A very present injury to competent contractors is caused by the marauding bands of ignorant workmen. Instigated by unscrupulous architects and engineers, who seek to cut prices so that they may propitiate their wavering clients, many a foreman, advised of tendered prices, has been induced to launch his frail barque upon the uncharted waters of mastership. The remedy for this procedure lies in legal enforcements necessitating a Bill of Quantities with the plans and specifications. Successful bidders will not then sit paralysed, wondering what they have overlooked.

Values: Material prices will have to be approved by governmental commissioners, a similar course to that adopted towards railway freight charges.

Economy in building waits upon the removal of the foregoing disturbing factors, as well as upon innovations in construction.

The immovable laws of the Medes and Persians are paralleled by the antiquated building by-laws of many communities. It has taken many years to convince their authors that reinforced concrete deserved some consideration. Even now a flimsy balloon timber firetrap is admitted in preference to a thin reinforced concrete wall.

The crying evil of the present town life is the cramped quarters, sanctioned by the building by-laws, in which citizens have to live.

About sixty years ago, in England, money was raised by taxing window lights. To dodge this iniquitous tax, people bricked up many of their windows, the result being that their health and eyesight were seriously affected. That lesson has never been forgotten, and our present by-law that requires the window area to be one-tenth of the floor area is a result. I might here mention that the statesmen who devised that window tax became blind. The public unfeelingly commented "He taxed God's light and the Lord has withdrawn the light of the sun from him."

The horoscope of building innovations must be plotted upon the present world. Concrete has developed into reinforced concrete; and the nebula of the Vitrous Age is within our vision.

The coming race will eliminate the use of steel in reinforcement; electrolysis will dissolve our skyscrapers within decades.

Regrets are unavailing and unnecessary. Rapid transit facilities will develop outlying suburbs, whereon the present hives of workers will be distributed.

The telephonic communications, now a necessity and a curse, will be replaced by personal wireless telephony. Our thumb prints will be sent to selected communicators; magnified into an electrotype, they will be the method of "tuning up" to our correspondents.

Building deteriorations (resulting from earth and traffic tremours), as well as disastrous fires, will necessitate quake-proof structures.

These present and future conditions ordain the use of concrete, in all its many adaptations, as our future building material.

Wall construction will be of poured concrete, faced with artistic brick, iron and other entablatures. Plaster compound with fusible minerals will enable the constructor to cover his structure with preparations, which, when dried and ignited, will result in a vitrous glaze, surpassing in sheens the colors of the mirage.

Pipes and conduits will be impressed into reinforcing duty, saving, thereby, space and appearance.

Wall papers will be displaced by tintings, sprayed ón to the concrete walls by air brushes. Stencils and bas-relief will remove all monotony.

Roof construction will change greatly. The hideous forest of chimneys as seen in England is here replaced by a single flue; but even that flue will disappear when our contaminations, whether of dust, air or smoke will be blown into the sewers, there to assist in the sewage disposal problem.

Smoke abatement will permit of the utilization of our roofs. Flattened into sleeping quarters or roof-gardens, they will be bordered by encaustic embellishments and surmounted by pergolas and minarets and cupolas, thereby developing a new style of architecture that will embody the wonders of the east with the benefits of the west.

In no other country in the world, it is asserted, are there such vast, varied and valuable deposits of gypsum as in the province of Nova Scotia. The exposures show beds of from a few feet to hundreds of feet in thickness, ranging in color from gray to snow white, and frequently of the best quality. Gypsum is found in Pictou, Antigonish, Colchester, Cumberland, Hants, Kings and Halifax counties, and in every county of Cape Breton. Some of the deposits have been operated for nearly a century, but during all this time only two mills have been established for the manufacture of gypsum products, one at Windsor in 1901 and the other at Cheticamp, Cape Breton, in 1908. The production of gypsum rose from 300,000 tons in 1908 to 322,974 tons in 1910, practically all being sent to foreign countries, the United States taking $290,949 worth in 1910.

"Roads That Pay" is the title of an interesting booklet received from the Canadian Mineral Rubber Company, 1 Toronto street, Toronto. A few words of wisdom from Jas. J. Hill are contained on the introductory page:—"Good roads are expensive, but it costs more money to do without them than to build them." The "roads that pay," it is claimed, are the waterproof, dustproof and autoproof roads, made with Pioneer road asphalt. Pioneer road asphalt has been used extensively in the United States where it is held by leading experts to be the most economical and durable material of the kind ever used. Pioneer roads are strangers to dust, mud, ruts, and holes. A firm, elastic surface, proof against the disintegrating effects of time and traffic, is assured. Pioneer road asphalt does not evaporate and there are no excessive after costs due to repeated renewals. As announced in a recent issue of the "Contract Record," the city of Victoria has awarded its whole season's contract to the Canadian Mineral Rubber Company. Municipal authorities will do well to get in touch with this firm at its Toronto office and secure catalogues and quotations.

---

* Extracted from Address delivered before the Architectural Building, Contracting and Engineering Conference, New York, May [illegible] 1911

LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested giving the main facts tersely.

Negligence of Building Contractor.—In an action, Earle vs Reid the defendant was repairing a 4 storey brick building when it collapsed and fell against an adjoining building, injuring a clerk, who brought action for damages to recover $3,000. In the trial it was shown that defendant had acted with negligence in placing the iron columns on a defective wall. Judgment was given plaintiff for $500.

Mechanics' Lien.—Seaman vs Canadian Stewart Company. Plaintiffs brought action to recover $21,834.87 from Canadian Stewart Company for work done and materials supplied in connection with excavation of the site and foundation of a elevator at Fort Willian. Plaintiffs entered upon the work, and in course procured advances from the Union Bank. Later the work was taken out of plaintiffs' hands. Later plaintiffs assigned to the bank $5,371.79 out of the $21,834.87 for which they claimed a lien under the Act as collateral security. Bank caused a lien to be registered. The company paid $24,000 into court. At the trial it was held that the agreement did not express all the terms of the agreement between parties; that their minds were not agreed, and there was no contract. Court found plaintiffs entitled to $20,265.04 for their work done upon quantum meruit for which judgment was entered with costs and plaintiffs were declared entitled to a lien upon the lands in question and the money paid into court.

The Court of Appeal held that there was a valid contract; that plaintiffs should be paid for amount of yardage excavated by them, amounting at contract price, to $9,028.85, to which sum the judgment should be reduced.

Negligence in Municipal Work.—In the action, Boyd vs the city of Toronto, heard recently in the Divisional Court, the plaintiff sued for $1,000 for damages which he alleged had been caused by the negligence of the city in digging a trunk sewer along a street without taking the proper precautions for shoring up the sides of the sewer whereby a subsidence of his land occurred with the result that the walls of the house were cracked and the structure otherwise impaired. The court held that it was not even necessary to prove negligence in the methods of work adopted by the city, and that in operations of this kind the work must be carried out so as not to disturb the soil of the frontages. The plaintiff was awarded judgment for $600 and costs, this amount being upheld subsequently in an appeal.

J. D. McArthur vs. Dominion Government

One of the biggest law suits entered in Canada for some years will be begun shortly, with the Federal Government as defendant and the contractors on the National Transcontinental Railway as plaintiffs. The amount involved totals about $700,000, and the issue is as to the proper amount the government should pay for the work done by the contractors on the National line from Moncton to Winnipeg, now nearing completion.

Some months ago the Board of Arbitrators, consisting of Mr. Collingwood Schreiber, chief consulting engineer to the government; Chief Engineer Grant of the National Transcontinental Railway Commission, and Chief Engineer Kelliher of the Grand Trunk Pacific Railway Company, after an inspection of the whole line from Moncton to Winnipeg, agreed on a report deducting about $700,000 claimed by the contractors according to the classification of work done under the contract specifications. The deductions were made on the ground of over-classification of rock material, overbreak, etc.

Most of the cases in dispute between the engineers of the Commission and the engineers for the contractors are in district "F," between Winnipeg and Superior Junction, under contract to Mr. J. D. McArthur. He is now entering suit, on behalf of all the contractors affected, to have the Exchequer Court decide as to the correctness of the award. An immense amount of evidence will be necessary before the court can decide on the facts of the case, and the legal costs will probably constitute a new high record for Canadian civil actions. It is thought probable that the final award will allow the contractors between three and four hundred thousand dollars more than the arbitrators have allowed.

The action brought by the Standard Construction Company, of Montreal, against A. E. Wallberg and the Mines Power Company, of which Wallberg is president, to recover $16,185 for work performed under certain contracts, was dismissed with costs. The plaintiffs contracted with the defendants to build a transmission line from their power house to their sub-station at Cobalt, 25 miles, for $19,000. When they had finished only part of the work they withdrew their men. The Court held that the plaintiffs, having failed to complete their contracts, could not recover from the defendants, who expended $5,000 to finish the line. The judge referred the matter of the damages to which the defendants are entitled, to the local master, suggesting to the defendants that they might make allowance for the absolute inadequacy of the amount provided for under the contract for the construction of the transmission line.

Trade News from Montreal

The new 25,000 barrel mill of the St. Lawrence Flour Mills Company, Limited, is now completed and ready for operation. It is situated at 1110 Notre Dame street west and extends from that street to the canal. Connected with the mill is an elevator of 350,000 bushels capacity. The mill is of reinforced concrete construction and the elevator of concrete and tile. The contractors for the mill construction were Messrs. Barnett & McQueen, of Minneapolis and Fort William. The machinery was supplied and installed by the Allis-Chalmers Company, of Milwaukee. The mill will be operated by electrical power supplied by the Canadian Light Heat & Power Company, the installation for which has already been completed. Mr. George A. Grier is president of the company, Mr. Thomas Williamson, vice-president, and Colonel Labelle, managing director.

Mr. C. E. Deakin, of Montreal, has been awarded the contract for a 100-ton Kraft paper mill to be erected on Baptist Island, opposite Three Rivers, for the Wayagamack Pulp and Paper Company, Limited. The installation of a 50-ton unit of machinery is under way and is expected to be ready for operation by October 1st, with another 50-ton unit to follow in the spring.

Messrs. D. G. Loomis & Sons have been awarded a contract for a new flour mill for the Dominion Flour Mills, Limited, which was incorporated with an authorized capital stock of $1,500,000. The mill will be situated on the Lachine Canal, opposite Messrs. Loomis' offices. It will cover a ground area of 75 feet by 200 feet. The capacity of the mill will be 2,000 barrels a day. The concrete foundation has been begun and the superstructure will be of concrete and brick. The plans for the building have not yet been completed and the total cost of the structure is not yet known. Mayor W. B. Wood, of Brantford, is the president of the new company. This mill will be operated in connection with five others in Ontario and the west, now controlled by the new company.

Good progress is being made on the conrete work of the C. P. R. bridge on Notre Dame street, in rear of the Viger station, and also on the new paint factory of Ramsays, Limited, at Maisonneuve. Both of these contracts are being carried out by Mr. E. G. M. Cape.

The plans of the new Windsor street station of the Canadian Pacific Railway provide for an elaborate system of passenger and traffic elevators. In the part of the building now used by the company there are three elevators, and the drawings for the extension show eight more, so that in all there will be eleven elevators in the station when the addition now being built is finally completed. The entire system of lifts will be operated from a central plant located in the basement of the station and nine of them will be of the direct vertical plunger and counterweight pattern and the other two of the horizontal hydraulic type. The controlling valves of the elevators will be so constructed that the lifts will come to a stop without jar or shock and the passenger hoists will be all equipped with a limit stop valve, which will automatically decrease the speed of the elevator as it nears either end of its run and will ultimately bring the cage to a stop if the operator should by any chance neglect to do so himself. The elevators will vary in size from 6 feet by 6 feet to 9 feet by 11 feet and will have runs varying up to 170 feet. The shafts for these elevators are now being sunk, the depth in the shafts sunk so far being about 193 feet. The elevators will be capable of raising loads of from 250 lbs. to 7,000 lbs.

Address on City Planning

Montreal was visited recently by Mr. Raymond Unwin, the noted expert in city planning, and author of "Town Planning in Practice." Mr. Unwin is the architect of the Hampstead garden suburbs near London and is regarded as an authority on civic hygiene and kindred subjects. Mr. Unwin gave an illustrated lecture in the art gallery before a large and fashionable audience, under the auspices of the City Improvement League in co-operation with the Art association of Montreal. Mr. Unwin urged his audience to profit by the mistakes that had been made in England, where manufacturing towns and cities had sprung up without any design or supervision that would make for the beauty of the place or the health of the residents. The passing of the Town Planning Act gave citizens the power to call on town councils to enforce the Act when they did not do so voluntarily. Montreal, Mr. Unwin considered, had now reached a stage when serious attention should be given to plans for the future welfare of the city. He had made a tour of inspection through the city and found that slum areas were developing both in the centre and in the suburbs. Dire consequences would follow if these were allowed to spread or even to exist in the districts in which they now were found. The death rate in Montreal was now over twenty-two per thousand as against fourteen per thousand in the big city of London, and about four per thousand for the garden cities. He described a hovel he had seen about a stone's-throw from the City Hall which contained two bedrooms without any windows and with no ventilation except through doorways leading into a stuffy living room and in front of this living room was a heap of malodorous garbage. Such buildings were calculated to kill off children by thousands and men and women by hundreds. If the old wooden shacks constructed between the main buildings were torn down, light and fresh air would be given access to these residences and the death rate would be reduced accordingly. "What is the use," he asked, "of sending people to Montreal to build up a big city and develop its commerce if they are to be killed off at this rate?" Lantern views were shown of modern planned cities and towns in Europe which the lecturer declared had an individuality of their own. One city was built on a hillside, another on a plain, and a third on a harbor. The American checkerboard system of long streets running at right angles to one another was contrasted with German cities built in harmony with the contour of the ground, and with the ancient Greek cities, in which the scenic beauties had been preserved by ordered planning. The advantages and disadvantages of straight and curved streets were well illustrated by views of Paris, Oxford, London, and Augsburg, and the drawbacks of diagonal streets by views of Chicago and Philadelphia. The relation of tree planting to architecture was illustrated by views of Stuttgart and Versailles. Mr. Unwin described the origin of the garden city idea in the haphazard subrubs projected by speculative builders. The audience repeatedly showed its approval of this system represented England at the First International City Planing Conference held in America.

A day or two after Mr. Unwin of Garden City fame visited Montreal, Mr. Thomas Adams, executive inspector of the local government board for England under the British Town Planning Act, arrived there from Philadelphia, where he was one of the English representatives at the City Planning Convention. Mr. Adams expressed the opinion that the Town Planning Act might be adopted in Canade with great advantage. Legislation on this subject he thought would come within the powers of the provincial legislature. Mr. Adams is a very strong advocate of suburban residence. Speaking of New York he said that he though the money spent in building sky-scrapers would be better expended in tunnelling under the rivers and building railway lines or establishing other means of communication between Manhattan and the main land. He believes in spreading the people out over the country where there is plenty of light and fresh air, and his advice to every large city is to employ every means possible to prevent congestion.

The Norman W. Henley Publishing Company, 132 Nassau street, New York, have favored us with a set of their Concrete Workers' Reference Books. These books give complete practical information upon the construction of concrete wall forms, concrete floors and sidewalks, silos, concrete chimneys, monuments, mausoleums and burial valuts, and also directions for the molding and curing of ornamental concrete. The author is A. A. Haughton. These books may be obtained at fifty cents each. They should be of great value to every contractor and concrete worker.

Bulletin 107, issued by the John McDougall Caledonian Iron Works, Limited, contains particulars of the official tests of McDougall turbine pumps which form part of the waterworks system of Montreal. The pumps were tested in actual service under exacting conditions. It is interesting to note that in one case the pumping unit earned a substantial bonus and that in both instances the pumping units largely exceeded the contract capacity.

The annual convention of the Union of Canadian Municipalities will be held at the City Hall, Quebec, August

The Usual Delay at Ottawa

Indecision as to Site Holds Up the New Departmental Buildings Activity in Other Quarters

Ottawa, June 10, 1911

There is another delay in the progress of the new departmental building for the federal government, which was to have been erected on Mackenzie avenue. After the first plans were adopted, the Ottawa Improvement Commission came forward and urged that room should be left for the driveway to run in front of the new building. This was agreed to and necessitated a rearrangement of the plans, making the building narrower and at the same time taking off one storey. Now another deputation urges that the building thus cramped up between the driveway and Susesx street would spoil its effect and wants the government to expropriate land on the other side of Sussex street and to build the new building there. Accordingly the entire progress has been held up until there is a final decision as to where the structure shall go. In the meantime it is urged that one large scheme should be prepared which for years to come would regulate the building on the part of the government in the capital, as well as the growth of the city and the work of the Improvement Commission. For some time the idea of having such an extensive plan has been mooted to regulate how the city should grow and the present indicision with regard to the location for the departmental building has furnished another argument in its favor.

Low Figures for Street Paving

The contracts have been let for the street paving and show that the city has again been able to get very low rates. The two successful tenderers were the Union Construction Company and the Ottawa Construction Company. The specifications are for a heavy asphalt pavement made of 6 inches of concrete and 2½ inches of asphalt, with a ten-year guarantee. The prices range from $2.18 to $2.22 a square yard.

Work has begun on the west end drainage scheme. The contractor, Thomas McLaughlin, has 200 men on the job with 4 sewer trench machines and double drum steam hoists, 8 steam drills, 2 forty horse power boilers, rock crusher and concrete mixer. There are about 3½ miles of sewer construction.

There was never such a rush in the brick business in Ottawa as at the present time. The plants will manufacture about eight or nine million more brick this year than last owing to the new plant of the Peerless Brick and Tile company which, it is expected, will produce 12,000,000 brick this year, while last year it only turned out about 3,000,000.

Never in the history of the city was there so much renovating of dwellings as this year. In nearly every street, particularly where the more expensive residences are situated, there are large numbers of houses being rebuilt or considerably altered. It does not show much on paper but it means considerable activity in the buying of supplies.

The Supply Market

Sand is selling from 87½ cents to $1 a cubic yard, according to the haul. Gravel is selling at $1.25 a cubic yard, rubble stone at $1 a ton, crushed stone (2 inches) at $1.40 a ton, and crushed stone (five-eights inch) at $1.95 a ton.

There is a considerable shortage of labor both in the trades and in ordinary labor. In all the branches of the building line it is extremely hard to get men. In the case of the painting firms, most of them have advanced the charge per hour in jobbing from 45 cents to 50 cents.

Important Construction

Work on the Blackburn building, which will be perhaps are largest commercial building in the city, is progressing very satisfactorily. It is being constructed in three sections, the first of which will be completed about August. The corner section will be begun as soon as the first section is in a condition to receive the tenants.

Two important tenders are being called for just now. One is for an addition to the warehouse of John M. Garland & Sons, Limited, and the other is the new Congregational church. Both of these are in the hands of A. LeB. Weeks, architect. The Garland annex will be a reinforced concrete structure. In the case of the church, both brick and stone prices have beeen asked.

Contract News from the Coast

Vancouver, June 8, 1911.

The Grouse Mountain Scenic Incline Railway Company has been incorporated and capitalized at $750,000 in 1,500 shares of $500 each. Among the directors are: Ex-Mayor May, of North Vancouver; W. J. McGuigan, W. H. R. Collister, L. C. Miles, W. J. Manson, M.P.P., and W. H. R. Collister. The engineers are Waddell & Harrington.

This line will form one continuous route, operated by electric power supplied by the British Columbia Electric Company, and will start from their projected extension along the Capilano river at "Canyon View," five miles north of Vancouver, across Burrard Inlet. About 1½ miles eastward will be located the foot of the incline, from which point the observatory cars will be raised to an altitude of about 2,350 feet by one and a half miles of cables, constituting the longest incline in the world. From the top of the incline the railway will skirt the rugged crest of Grouse Mountain to a height of 4,250 feet to the selected pleasure resort, comprising 320 acres of undulating lands, including a small lake of 12 acres. An hotel will be erected here to provide accommodation necessary to the establishing of summer and winter sports, also pleasure grounds. The outlook from this high peak extends west over the island-studded straits of Georgia, Vancouver Island, and the Olympian range of mountains in Washington state. South and east views extend over Vancouver city, the Fraser river valley and Mount Baker in the United States.

The cost of construction of the railway will amount to $520,900; equipment of power house, poles, wires, cars, cables, etc., $99,100; hotel, $50,000; sport attractions, etc., $33,000; making a total outlay of $703,000.

Work clearing the right of way was commenced on May 22nd. Tenders will be called for the completion of the work by October 1, 1912.

Reference was made recently in the Contract Record to the fact that an English company, headed by Wm. Owen, M. E., London, Eng., would establish $20,000,000 steel works near Vancouver. It is now definitely stated that they will be located at Pitt Meadows, where 200 acres have been purchased bordering on Pitt river, on the main line of the C. P. R., about 20 miles from Vancouver. The capacity of the proposed works will be 1,000 tons daily, and some 3,000 men will be employed. Blast and open hearth steel furnaces and rolling mills will be erected. The plant and machinery will be brought from Europe.

The five-million-dollar mark is expected to be reached in city building at Edmonton, Alta., this year. For the vrst five months of the year the permits aggregated $2,500,000.

Building operations at Calgary have been tied up owing to trouble with the bricklayers. A recent report states that seventeen builders who are not associated with the Builders' Exchange, have signed up an agreement to pay 70 cents an hour.

Personal Mention

Mr. J. G. Lindsay, city engineer of Belleville, Ont., was a recent visitor to Lethbridge.

The South Vancouver council have appointed Mr. R. D. Royston assistant engineer for that municipality.

Mr. P. B. Motley, of the C. P. R. engineering department, has been appointed engineer of bridges for that company, with headquarters at Montreal.

Professor Stone, Dean of Engineering at the University of New Brunswick, has resigned in order to take up the practice of his profession at Vancouver.

Mr. L. M. Jones, formerly assistant city engineer of Port Arthur, Ont., has been appointed city engineer, vice Mr. Antonisen, resigned.

Mr. Harry Worswick, until recently associated with the Worswick Paving Company, has been appointed foreman of paving construction at Victoria, B.C.

Mr. R. S. Lea, of Montreal, has been selected by the city of Vancouver to report upon a sewerage system for the drainage of the section lying between the inlet and the north arm of the Fraser river.

Mr. D. Chene, city engineer of Hull, Que., has resigned his position in consequence of interference with his department from the city council. Mr. Chene states that it was one of the conditions of his appointment that he be given full control. Instead of this he has been treated in an arbitrary manner and has had to submit to aldermen "who knew little about civic improvement and less about engineering." Mr. Chene has secured an appointment as sanitary engineer and architect with the Dominion Government. He will take up his new appointment immediately. A biographical sketch of Mr. Chene was published in the Contract Record of May 31, 1911.

Mr. Dosithe Chene, formerly City Engineer of Hull, Que., who has resigned.

Mayor Adams, of Lethbridge, has been investigating paving work in Edmonton, Calgary anad other cities with a view to obtaining information for Lethbridge, which will undertake a considerable amount of this class of work this season.

City Engineer Antonisen, of Port Arthur, has resigned, following an order of the city council that all civic employees must register their arrival and departure by a time clock. This, Mr. Antonisen considered beneath the dignity of a city engineer and he accordingly refused to work under such conditions. Mr. Antonisen is a native of Christiana, Norway. He left Europe for San Francisco in 1888 and made connections with Canada in 1905, securing a position with the C. P. R. as resident engineer at Winnipeg. He was appointed town engineer of Port Arthur in 1906. He is a member of the Canadian Society of Civil Engineers and a charter member of the American Society of Engineering-Contractors. A detailed sketch of his career was published in our issue of June 8, 1910.

Mr. J. Antonisen, the retiring City Engineer, Port Arthur

Following the resignotion of Mr. C. M. Arnold, the city of Lethbridge, Alta., is now without a city engineer. For the present Mr. H. Meech, formerly assistant to Mr. Arnold, is taking over the work and will continue to fulfill the duties of city engineer until an appointment is made. This state of affairs comes at rather an inopportune time inasmuch as the city is contemplating the expenditure of about $500,000 on municipal improvements. Numerous applications have been received for the post, however, and it is expected that an appointment will be made in the near future.

Mr. E. N. Harvie, engineer of the municipality of South Vancouver, has resigned. The causes are stated to be the refusal of the city council to give Mr. Harvie sole control of his department and the independent appointment of an assistant engineer by the council. Mr. Harvie has held the post since March, 1909, since which date work aggregating in value $540,000 has been carried out under his supervision. The salary attached to the post is $150 a month.

Mr. Willis Chipman, Toronto, has been asked to act as consulting engineer with City Engineer Macallum, of Hamilton, Ont., in the preparation of a report on the water works system.

The city of Guelph, Ont., established a record for itself last month by issuing permits to the value of $214,770 The permits include that for the Homewood Sanitarium, which is to cost $175,000

Forty Years in the Canadian Field

One of the best known engineers in Winnipeg, and in Western Canada for that matter, is John William Astley, C.E., engineer of construction for the city of Winnipeg. Mr. Astley tenders against every class of contractor for every class of work in Winnipeg, and he is conceded to be one of the shrewdest estimators in the profession. The ability to estimate for work and undertake the construction satisfactorily is possessed by very few engineers, and Mr. Astley's success in this department has stamped him as an engineer of outstanding ability. That this is pretty generally realized is evidenced by the fact that he received a tempting offer recently from the city of Victoria, B.C. He declined in favor of his old post at a new figure. The city of Winnipeg rose to the occasion—and well it might, for men of the type of J. W. Astley are scarce nowadays.

Mr. J. W. Astley, Engineer of Construction for the City of Winnipeg

Anything like a detailed sketch of the career of such a man as Mr. Astley, who has had over forty years' wide and varied experience, would fill a book. His earliest records go back to the early '70's, when he took up railway engineering with the Northern Railway of Canada, rising from assistant engineer to become chief engineer of the Muskoka branches of that line. He has been engaged in every class of engineering and construction work for the Canadian Pacific and other railways. Probably he has explored more railway routes than any other man in Canada. He is a born bush man, and is possessed of a cast iron constitution.

In 1900 he was appointed assistant city engineer of Winnipeg and remained with Col. H. N. Ruttan, city engineer, until 1908. He then undertook to explore a railway from Glenora to Dean Lake, B.C., and another line from Glenora to Dawson. Mr. Astley remained in Dawson for some time as chief engineer and then manager of the Klondyke Mines Railway. He also designed and built the Dawson waterworks, the most northerly system of the kind on the continent. In 1908 he was appointed to his present position of Engineer of Construction for the city of Winnipeg. Mr. Astley has just entered upon what promises to be a very busy season. As we have said, he tenders on many classes of work, and he secures nine-tenths of the construction upon which he figures. This means over one million dollars a year. He is a man of indomitable energy. "I have a holy unrest, like the wandering Jew," he once told us. "I must be driving ahead at some undertaking, whether it is municipal work or travelling around Europe on my own."

J. W. Astley is a man who has succeeded on his own merits entirely. The salary question in municipal work has always been a secondary consideration with him and yet he has succeeded in this as in other matters, for the reason that he is known to say what he means and mean what he says. Had he confined his attention exclusively either to engineering or contracting he would have achieved success. As it is, he has chosen something harder—the combination of the two, and he is doing it well.

Eminent American Engineer appointed on Quebec Bridge

Mr. Charles Conrad Schneider, who has been appointed to the Board of Engineers in charge of the construction of the Quebec bridge, was born at Apolda in the Duchy of Saxony, Germany, on April 24, 1843. After graduating from the schools of his native city he served two years' apprenticeship in a machine shop to prepare himself for engineering studies. This is quite a common practice in Great Britain and on the continent, where a knowledge of practical work is considered essential for the complete grasp of theoretical studies. In 1861 he entered the Royal School of Technology at Chemnitz, from which he graduated three years later. After graduating he served in various capacities in the shop, the field and the office, obtaining rapidly a general knowledge of all branches of manufacture. In 1867 he came to America and worked for three years as a designer of locomotives and other machinery at the Rogers Locomotive Works, at Paterson, N. J. His early training, therefore, eminently fitted him for the career of a structural engineer, in which he has achieved so much distinction.

Mr. C. C. Schneider, of Philadelphia, who will share with Messrs. Monsarrat and Modjeski the responsibility of the Quebec Bridge construction

It would fill a volume to enumerate even the more important works with which Mr. Schneider has been identified during the last 30 or 40 years. But it is of special interest to the Canadian profession to recall the fact that in 1882 he designed the cantilever bridge over the Fraser river for the Canadian Pacific Railway, and in 1883 the famous Niagara river cantilever for the Michigan Central Railway. The latter was probably the most notable American structure up to the opening of the Brooklyn bridge, for it was built in six months and contains many new ingenious ideas in design and detail. Among other structures of this period which Mr. Schneider designed was the Stony Creek viaduct on the Canadian Pacific Railway, which, at the time of its construction, was the highest viaduct on the continent.

During the last eight years Mr. Schneider has devoted his attention to private consulting practice and has acted as consulting engineer for the American Bridge Company. Previous to this he was vice-president of that company, in charge of engineering. He entered the position when the American Bridge Company was formed, with the Pencoyd Iron Works, of Philadelphia, as its most important constituent. He had organized a bridge and construction department at the Pencoyd Works and had directed the design and construction of bridges for nearly all of the leading American railways.

Mr. Schneider is a member of a number of leading engineering societies. He is a past president of the American Society of Civil Engineers.

News and Notes

Regina, Sask., issued building permits last month to the value of a million dollars.

During the first five months of the current year Hamilton spent $539,005 on building. This is $336,380 in excess of the corresponding period of last year.

From June 1 to May 21 the city of Victoria eypended $1,181,785 on building operations. For the corresponding period of last year the total was $975,235.

The Northern Construction Company have over 600 teams at work on the Brazeau Line on the C. N. R., and will begin grading on the Red Deer-Calgary branch next week.

The city of Edmonton is planning an expenditure of $225,000 on paving work this season. A by-law will be submitted at an early date. At Calgary the expenditure in paving will be nearly a million dollars.

The building permits issued last month at London, Ont., total $195,470, compared with $87,165 for May, 1910. Since Jan. 1, 1911, the permits total $413,667, as against $415,880 for the corresponding period of 1910.

Competitive plans are to be invited from Canadian architects for the new Technical School buildings at Toronto. First, second and third awards will be made. Details of the prizes will be announced later. The general plans for the new buildings will not be outlined until early in the fall.

We note that the Appleby Company of England, who are represented in this country by the Ford Iron Company, 485 St. James street, Montreal, have now on order 17 Kerpely gas producers of the largest size, including a battery of nine for the new steel works of John Lysaght, in Lincolnshire, Eng.

Messrs. A. B. Ormsby, Limited, Toronto and Winnipeg, report the first five months of 1911 to be a record in connection with building within Winnipeg and the west. Among the many contracts they have closed in Winnipeg during the past few weeks have been the North Collegiate, for the Winnipeg Public School Board; the Bank of Montreal in Winnipeg, for Messrs. Norcross Bros.; Rutherford Apartment, for Messrs. Claydon Bros., Winnipeg; new terminal station for Messrs. Claydon Bros.; additions, St. Johns telephone exchange, for Messrs. J. J. & J. M. Kelly; Manitoba Government telephone stores building, for D. D. Wood; Grose & Walker, warehouse; new police station for D. D. Wood; new Y. M. C. A., north end, for S. Brynjolfson; additions to Dingwall Block for Messrs. Saul & Irish; new C. P. R. coach shops for Messrs. Claydon Bros.; McLean Building at Calgary for J. A. Girvan Company; new house for Mr. Gooderham; new C. P. R. boiler shop for the J. McDiarmid Construction Company; new Brooklands School for J. Dolmer; new Nurses' Home in connection with Winnipeg General Hospital for Messrs. Wallace & Aikins; new steam plant for Winnipeg Electric Railway Company, and C. P. R. freight sheds for R. J. Barker & Company.

The city of Toronto water works department recently purchased from the John McDougall Caledonian Iron Works Company, Limited, ten Venturi meters, ranging from 12 in. to 36 in. in diameter. These meters are a necessity for all turbine pumps and almost a necessity for reciprocating pumps in order to check up the slippages and other irregularities. One of these Venturi meters now in operation in the city of Montreal has a diameter of 108 in. and a range between 30 and 75 million Imperial gallons per 24 hours. At the present time it is measuring the supply of the Montreal pumps of an average pumping capacity of 42 million Imperial gallons per 24 hours.

According to an announcement given out recently by Mr. C. C. Ballantyne, the Sherwin Williams Company of America have sold out their large Canadian and British interests to the Sherwin Williams Company of Canada, Limited. The purchasers are C. C. Ballantyne, managing director of the Sherwin Williams Company of Canada, Limited, and Mr. W. H. Cottingham, president of the Sherwin Williams Company of America, these two being associated with other strong financial interests. Mr. Cottingham will be president of the new concern and Mr. Ballantyne, vice-president and general manager.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope, and stating number of enquiry.

500. **Patent jointing cement.**—A London firm would like to get into communication with Canadian importers of engineers' supplies likely to be interested in a new patent jointing cement.

506. **Agencies abroad.**—A London company is open to undertake agencies in financial matters for any kind of Canadian business, and invites correspondence from responsible firms interested.

516. **Steel rods and hoops.**—A Welsh firm manufacturing steel rods and hoops is anxious to extend their Canadian business by getting into touch with actual consumers and merchants in the Dominion.

517. **Water-tube steam boilers.**—A north of England firm would like to interest Canadian manufacturers and others in their water-tube steam boilers.

525. **Cement.**—A firm in Cartagena wishes to be placed in communication with Canadian exporters of the above article. Prices to be quoted f.o.b. New York. Brand usually imported 'Atlas Portland.'

542. **Electrical insulators in stoneware and porcelain, &c., &c.** Inquiry is made by a well known London firm manufacturing electrical insulators in stoneware and porcelain; also conduits, troughing, cable racks and floor tubes, &c., for power stations, for the names of Canadian importers.

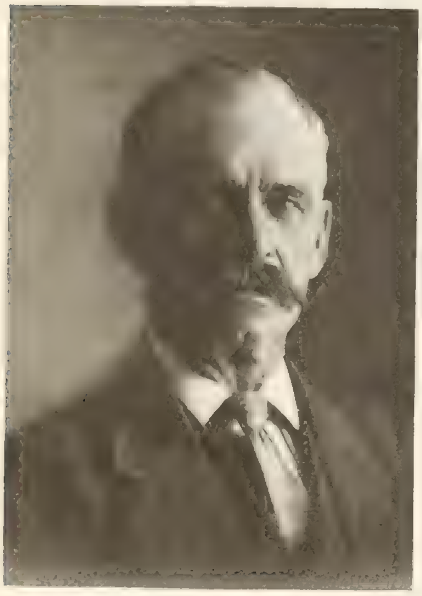
543. **Tiles and mosaics.**—A firm in the English Midlands wishes to get into touch with a Canadian firm who are practical fixers and designers of them and will [illegible]

[illegible] with a view to interesting them in tiles and mosaics.

343. **Tiles and mosaics.**—A firm in the English Midlands wishes to get into touch with a Canadian firm who are practical fixers and designers of floor and wall treatments, with a view to interesting them in tiles and mosaics.

Medicine Hat Builders' Exchange

The Medicine Hat Builders' Exchange is one of the youngest organizations of its kind in the west, and already it is one of the most active. A short time ago it affiliated with the Provincial Exchange of Alberta, which is comprised of the Calgary, Lethbridge, Edmonton and Medicine Hat exchanges, working under the jurisdiction of the Canadian National Association of Builders. There is a general disposition among contracting interests in Western Canada to take a firm stand in defence of the individuality and freedom of the employer, and in this respect the members of the Medicine Hat Exchange have shown themselves to be of one mind. The Exchange movement is strong at Medicine Hat and the membership of the association is assuming gratifying proportions, although necessarily not so large as some of the older established organizations. We give herewith photographs of the president, Mr. J. A. Trimble; second vice-president, T. F. Hook, and secretary, Mr. J. D. Everard. Mr. Everard is doing excellent work in the interests of this young exchange and we expect to hear something more from Medicine Hat in the near future.



President: J. A. Trimble

Secretary: J. D. Sverard

Vice-President: T. F. Hook

OFFICERS OF THE MEDICINE HAT BUILDERS' EXCHANGE

Canadian Railroad Development

It has been officially announced, according to information received from Nelson, B. C., by the Canadian Pacific Railway, that a line will be constructed this summer from Three Forks to the Lucky Jim Mine, and that contracts will be let and work started shortly.

The Canadian Northern Railway is understood to be planning an initial expenditure of $5,000,000 and an ultimate expenditure of between $30,000,000 and $40,000,000 for the construction of terminals in Montreal and Toronto. It is understood that there will be new terminals in Toronto and Montreal, and in connection with the latter it is proposed to ultimately put a bridge over the St. Lawrence.

The Grand Trunk Pacific has decided upon the location of the divisional point on the Edmonton-Calgary line. It will be at the west end of Buffalo Lake and the name selected for it is Mirror. Steel already has been laid to that point, and a train service will be inaugurated next month. It is expected that in addition to being a divisional point, Mirror will also be the junction point for at least two branch lines, one east and one southeast, with a possibility of a western extension. Provision will be made for yards, roundhouses and light repair shops.

Preliminary surveys have been completed by the Canadian Pacific Railway for a line of railway from Wilkie, Sask., through to the Cold Lake country, to meet a line located west from Fort McMurray country two or three years ago.

L. B. Merriam, 125 Phoenix Building, Winnipeg, is engineer in charge of the construction of the Kootenay and Alberta Railway in southwestern Alberta. Grant Smith & Co., of Spokane, Wash., are the contractors and D. Whittaker, of Pincher Creek, Alta., is resident engineer. Owing to some 12 or 14 days' rain and snow during May the work has been somewhat delayed. The estimated outlay is $450,000. Of the constructional features of interest may be mentioned one large cut of 150,000 cubic yards and two trestles 150 feet high, requiring 2,000,000 feet B.M. of timber in their construction. Nearly all of the timber required for these structures was either on the ground or on the road at the time of writing (June 3). In addition to the ordinary grading outfits on the work there are four machines in use, two of which have steam engines driving the belt direct.

Mr. C. S. Cunningham, superintendent of the Southern division of the Grand Trunk Railway at St. Thomas, Ont., has been transferred to the Western Division at Detroit, Mich., as Acting Superintendent, pending the return of Mr. F. W. Egan, who has been granted leave of absence on account of ill health. Mr. C. G. Bowker, Assistant Superintendent at London, Ont., will have charge of the Southern Division with headquarters at St. Thomas.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Berlin, Ont.

County Corncil decided to purchase road roller and stone crusher. $2,700 debentures will be raised. Road Commissioner, Clerk Bowman.

Chatham, Ont.

Tenders are called for glazed sewer pipe. Owner, City of Chatham; W. G. Merritt, city clerk, King st. from Duke street to P. M. railway; Forest street from Arnold to Delaware avenue; Charteris street from William to east end of same street; West street from Lorne avenue to Grey street. Tenders closed June 12.

Dereham, Ont.

Tenders called for improvement drain (Reynold's Creek), Dereham Township, Oxford County; Clerk, Alex. Bell, Verschoyle. Work, 6 1/5 miles in length, and according to estimates consists of excavation of 28,940 cubic yards of earth. Plans, etc., at residence of Alex. Bell, clerk. Tenders received until June 19th by clerk.

Halifax, N. S.

Contemplated cement walks, $5,750. (Young avenue). Owners, City of Halifax; city engineer, F. W. W. Doane. Sidewalk has been ordered by council. Report later.

Lindsay, Ont.

Tenders called for bridge. Owner, Tp. of Carden, Victoria, Co.; clerk, J. R. McNeillie. Tenders close July 5th. Advertisement in "Tenders and For Sale Department" of this issue.

Montreal, Que.

Tenders called for filtration beds, etc., $750,000. Owner, city of Montreal; engineer, Geo. Janin, City Hall, Montreal. Work to be finished by September, 1913. Tenders to be in by July 13.

Moose Jaw, Sask.

Tenders called for concrete culverts. Owner, City of Moose Jaw; W. F. Heal, city clerk. Engineer, J. M. Wilson. Three concrete culverts. Tenders received by city clerk until July 19th for construction.

Tenders are called for street sweeper. Owner, City of Moose Jaw; W. F. Heal, city clerk. Tenders called until June 12 for supply of 1 street sweeper. Prices f.o.b., Moose Jaw, and endorsed "Tenders for Street Sweeper."

Nanaimo, B. C.

Tenders called for paving. Owners, Corporation of Nanaimo City; engineer, Allan Waters. Tenders called after June 7th for laying 15,000 superficial yards of asphalt and other alternative paving in business tsreets. Plans at office of city engineer.

New Glasgow, N.S.

Tenders called for waterworks, $200,000. The town will call for tenders for excavation and laying of pipe from pumping station, 4-7 miles out in the country. Tenders called after June 8. Supplementary report later.

Niagara Falls, Ont.

Pavement, (McRae street). Owner, City of Niagara Falls, Ont. Engineer, J. C. Gardner, Niagara Falls, Ont. Proposed work, ⅝ mile, 33 ft. wide. W. B. Masters, Niagara Falls, made McRae sub-division and is still holding it. Further negotiations, apply to W. B. Masters.

North Bay, Ont.

By-laws carried for waterworks and storm sewers. Owner, Municipality of North Bay, Ont.; commissioner of works, T. N. Colgan. Debentures by-law for waterworks extension, $100,000, sanitary and storm, $45,000. Both by-laws carried.

Oshawa, Ont.

Plans in progress for sewage disposal plant. Owner, Town of Oshawa; town engineer, Frank Chappell. Plans in preparation. Work to be secured by contract. Tenders not yet called.

Port Arthur, Ont.

Tenders called for pavements. Owner, Corporation of Port Arthur; city engineer, J. Antonisen. Tenders are called until June 24th. Advertisement in "Tenders and For Sale Department" of this issue.

Simcoe, Ont.

Specifications in progress, sewage and sewage disposal, $30,000. Owner, Town of Simcoe, W. C. McCall, clerk. Engineers, Chipman & Power, Mail Building, Toronto; complete system, tile pipe, size 20 in. down. Plans and by-law being considered.

Southampton, Ont.

Tenders called for extension of waterworks system. Town clerk, J. C. Eckford. Waterworks engineer, G. W. Martin, Southampton. By-law for $7,500 carried to extend (proposed) new intake pipe and cement basin and to install a new turbine pump and an electric motor of 40 h.p. Wanted—Price for furnishing, installing and connecting 40 h.p. electric motor and turbine pump, complete; also prices on c. i. pipe, say 600 ft. 12 in. dia. Full information on application to Waterworks, Eng. of town clerk.

St. Thomas, Ont.

Tenders called for concrete culverts. Owner, Tp. of Yarmouth, Ont.; engineer, Jas. A. Bell, C.E., St. Thomas. Two concrete culverts on town line between Delaware and Southwold. Plans, etc., at office of engineer. Tenders called by engineer until June [illegible]

Tenders called for reinforced concrete coagulating basin. Owners, Waterworks commission, St. Thomas; Geo. E. Croker, chairman. Tenders called until 5 p.m., June 24th, for construction of a reinforced concrete coagulating basin, capacity 400,000 gallons, at St. Thomas waterworks.

Thorold, Ont.

Tenders to be called for sewage pipe, $25,000. Owner, Village of Thorold; engineers, Chipman & Power, Mail Building, Toronto. 15 in., 12 in., 10 in., and 8 in. tile pipe, length about 15,000 feet. Tenders called shortly.

Estimates being made for road improvement, $15,000. Owner, Town of Thorold; D. J. C. Munro, clerk; engineer, J. E. Gardiner, Niagara Falls, Ont. $15,000 voted for road improvement at last election. Estimates being made for macadam roads and various kinds of pavements.

Negotiations in Progress for road paving. Owner, Stamford Tp. and rest of Welland County. Parties concerned, Stamford Tp. and rest of Welland County. Engineer, J. C. Gardner, Niagara Falls, Ont. Under consideration, about 100 miles of provincial aided good roads, providing engineer's report shows that proper allowance is being made for good roads already constructed. Engineer's report in about two weeks.

Walkerville, Ont.

Bids to be received for street paving and curb, $79,000. Owners, Owen McKay, Walkerville, Ont. Asphalt block on a 6 in. concrete foundation and reinforced concrete. About 25,000 yds. of the former and two or three blocks of the latter, on Sandwich street, Argyle, Monmouth and Devonshire roads and Victoria avenue. Money for the work was voted by the ratepayers Saturday, the work to be completed this year.

Welland, Ont.

Tenders to be called for street pavement. Owner, Town of Welland; G. R. Boyd, clerk. Engineer, D. T. Black, Welland, Ont. The clerk was instructed by council to call for tenders for vitrified brick, bitulithic with brick between car tracks and 18 inches on each side, asphalt block and tarolithic.

AWARDED

Halifax, N. S.

Contracts awarded for installation of 2200 water meters to John McFatridge, Argyle street, Halifax, at 60c per wiped-joint. Engineer, F. W. W. Doane, Halifax.

Lethbridge, Alta.

[illegible] storm sewer, sanitary sewers, water main. [illegible] gineer, H. W. Meech, acting city engineer, Lethbridge. Contractor, N. K. [illegible] on contracts, A, C, D. & E., $119,596

[illegible]

bridge, Alta. Engineer, H. W. Meech, acting city engineer, Lethbridge. Contractor, Forest City Paving Co., Lethbridge, Alta. and Regina, Sask. About 32,000 square yards of walk and 15,000 feet curb.

Contract awarded for cement pipe, [illegible]. Owner, City of Lethbridge, Alta. Engineer, H. W. Meech, acting city engineer, Lethbridge; contractor, Forest City Paving Co., London Ont., Regina, Sask. and Lethbridge, Alta. This pipe is substituted for vitrified tile piping for storm sewer. It has not been definitely decided whether it will be used or not.

Moose Jaw, Sask.

Contracts awarded for extension to storm sewers. Walter Mandin, Edmonton, Alta. City engineer, J. M. Wilson.

Contracts awarded for cement sidewalks. Moose Jaw Construction Co., $55,530.32, for sidewalks, curbs, and gutters. Engineer, J. M. Wilson, city engineer.

Contract awarded for street paving, $127,906. Owner, City of Moose Jaw, Sask.; W. F. Heal, city clerk; engineer, J. M. Wilson, Moose Jaw. Contractors, Moose Jaw Paving Company, $127,906. (Douglas Fir Blocks). National Paving Co., Ltd., will pave one street.

Oshawa, Ont.

Contract awarded for cement sidewalks to W. J. Anthistle, Cromwell street, London, Ont., at 11c. per sq. ft. Scott & Co., Sherbourne street, Toronto, tendered at 16c per sq. t. Town engineer, Frank Chappell.

Ottawa, Ont.

Contract awarded for pavements, King Edward avenue, to Ottawa Construction Co., $10,987. Engineer, N. J. Ker, city hall.

Contract awarded for pavement, $24,250., Somerset street. Engineer, N. J. Ker; contractor, Union Construction Co., Ottawa, Ont.

Strathcona, Alta.

Contract awarded for paving. Owner, City of Strathcona, Alta.; engineer, A. J. Maclean, Strathcona. Contractor, Bitulithis and Contracting Company, Winnipeg. Price, $2.95 a square yard. Two years ago $3.25 was the price charged—a year ago, $3.00.

Railroads, Bridges and Wharves

Ayr, Ont.

Tenders called for two concrete bridges, (over Cedar Creek). Owner, Township of Waterloo. Reeve, Thos. Hall, near Ayr. Engineer, E. O. Fuce, Galt. Plans, etc. with Thos. Hall or at office of engineer. Cement supplied by township council; tenders to be at so much per cu. yd. Tenders received by Thos. Hall until June 17th.

Brandon, Man.

Survey completed for railroad bridge. Owners, Canadian Pacific Railway Co., double tracking line. No decision as to action to be taken. Present two-span steel cantilever may be widened or new single track built alongside. Survey just completed, matter under consideration by Winnipeg office. Report later.

Tenders pending. Industrial spur. Owner, C. P. R. Engineer, E. Melsted, Brandon. Track will develop warehouse site, 4 track yards. Survey has been made one mile. Tenders have not been called.

Railway construction contemplated. Owner, Brandon, C. P. R., C. N. R., G. N. R., 1½ miles, survey made. Transfer line to connect all three railroads. Route authorized by railway commissioner. Engineers Board sits in Brandon, June 14, to hear application of city for orders to construct. G. N. R. to operate.

Golden, B. C.

Tenders to be called for bridge, $25,000. Owners, Department of Public Works, Victoria, B. C.; engineer, J. E. Griffiths, Public Works, Victoria, B. C. New swing bridge across Columbia river, 42 miles south of Golden to provide facilities for settlers of Windermere district. Definite date bids called not ascertained. Report later.

Halifax, N.S.

Tenders called for reinforced concrete pier and sheds. Owner, Department of Railways and Canals, Ottawa. L. K. Jones, secretary. Tenders called until July 20, 1911, for the construction of a reinforced concrete pier and sheds at the Deep Water Terminus Intercolonial Railway. Plans, specifications, etc., after June 20, at office of above or chief engineer Intercolonial Railway, Moncton, N.B., or consulting engineer John Kennedy, Montreal.

Peterborough, Ont.

Tenders called for two bridges. Owner, County of Peterborough; county clerk, E. M. Elliott, county office Peterborough. Steel work or superstructure required for Spencer's bridge, Drummer and Brown's Falls bridge, Burleigh. Plans, etc. with county clerk. Tenders received by clerk until June 19th.

Port Arthur, Ont.

Tenders called for breakwater at Bare Point, Rainy River district. Owner, Department of Public Works, Ottawa; secretary, R. C. Desrochers, Ottawa. Tenders are called until July 5 for construction. Plans, etc. at Dept. offices of district engineers, at Port Arthur, Toronto, London and Montreal.

Stellarton, N.S.

Tenders called for addition to engine house. Owner, Department of Railways and Canals, Ottawa. Chairman, Government Railways Managing Board, A. W. Campbell, Ottawa. Construction of addition of six stalls to engine house. Plans, etc., at office of the Secretary, Department of Railways, Ottawa; Station Master, Stellarton, Chief Engineer, Moncton. Tenders received by A. W. Campbell, until June 23rd.

Scarboro Township.

Tenders called for bridge, $10,000. Owner, County of York. Clerk, J. A. Ramsden, 57 Adelaide street east, Toronto. Engineers, Barber & Young, 57 Adelaide street east. Concrete abutments, length of span, 90 feet clear, width 16 feet. Tenders received by the Engineer until July 1, for superstructure and substructure.

Township of Burford, Ont.

Tenders called for bridge. Owner, Township; Wm. Milmim, Reeve, Cathcart, Ont. Tenders received until July 1 for the concrete work on a steel bridge. Plans and specifications at residence of Reeve.

Trail, B. C.

Tenders to be called for bridge, $150,000. Owners, J. E. Griffiths, public works engineer, Victoria, B. C. New bridge across Columbia at Trail. Authority given to instal fixed centre span, but piers to be of sufficient strength to support steel towers should it be decided to replace fixed with a movable span. Date bids to be called not ascertained. Report later.

Public Buildings, Churches, Schools, etc.

Brantford, Ont.

Contemplated hospital addition, $100,000. Parties interested, Hospital Board and city councils. To provide additional accommodation, city will be asked to vote $90,000, county $10,000 approximate. Vote will be taken shortly.

Tenders to be called for nurses' home, $20,000. Owner, General Hospital, Brantford. Architect, Taylor & Taylor, Brantford, associated with Weeks & Greeve, Buffalo. Tenders will be called about July 15th.

Tenders called for addition to church; owners, Methodist Church; architects, Taylor & Taylor, Brantford; 1 storey and basement, red brick, stone foundation, 62 ft. x 62 ft. hot water heating, electric light, shingle roof, interior finish, ash, metal ceiling. Tenders were received by George Wedlake, Brantford, until June 10, 1911.

Tenders wanted for convent, $10,000. Owner, Roman Catholic Church, Rev. Dean Brady. Architect, Robert Clohecy, 236 James street south, Hamilton, Ont 2½ storeys, hardwood and Georgia pine finish, 45 x 40, kitchen 30 x 30, hot water heating, electricity and gas, slate roof. Plans at St. Basil's Presbytery, 77 Albion street Brantford. Tenders to be received by architect until June 14, for carpentry and joiner's work.

Belleville, Ont.

Tenders to be called for two schools, $35,000 and $40,000. Owners, Board of Education, Belleville; architects, Ellis & Co., Manning Chambers, Toronto; 2 storey and basement, brick, stone foundation, steam heat, electric light, gravel roof, maple floors, pine trimmings. One school, 10 rooms; other, 12 rooms. Specifilation same for both. Tenders received after June 20, 1911.

Brandon, Man.

Contemplated church, $40,000. Owners, St. Matthew's Anglican Church, Brandon. Present church being sold, new structure to be started this year. Architects will be invited to submit plans. No details yet.

Plans in progress for addition to Princess Theatre, $5,000. Owner, C. Eagles, Brandon; architect, T. Sinclair, Brandon. Stage and basement to be extended 10 ft. to rear. Present truss roof to be ciled with composition.

Dunnville, Ont.

Tenders called for schools plumbing. Owner, Board of Education, Dunnville, Ont.; chairman, Thos. Marshall, Dunnville; secretary building committee, W. G. H. Gilpin. Plumbing of the new high school, also the public school. Plans, etc., with chairman. Tenders must be made in separate enclosures; received by the secretary until June 27th.

Fort William, Ont.

Tenders to be called for Y. M. C. A. $75,000. Owner, Y. M. C. A., Fort William, R. E. Mason, Fort William; 3-storey, solid brick, 100 x 100, cement foundation, cut stone, structural iron, fire escapes, fireproof doors, electrical work, steel beams, iron columns. Tenders called in about 10 days. If bids are within limit, may build 4 storeys. Supplementary report later.

Guelph, Ont.

Architect chosen for Y. M. C. A. building. Owner, Y. M. C. A., Guelph Architects, Mills & Hutton, Hamilton. Ont. W. A. Mahoney, Guelph, associate.

Glencoe, Ont.

Tenders called for school. Owner, Aldeleorough Tp. J. A. McRae sec.-treas., Wardsville, Ont. Tenders received until June 24, 1911.

Granby, Que.

Plans being prepared for St. Joseph street College, $50,000. Owner, Municipalite Scholaire de Notre Dame de Granby. Architect, Dalbe Viau, 76 St. Gabriel, Montreal. Brick and stone, cement foundation, cut stone, marble, terra cotta, tile, fireproofing, reinforced concrete, structural iron, fire escapes, vaults, sheet metal work, metal ceiling roof, cornice, fireproof doors, asbestos materials, pipe covering, electrical work, iron columns, about 60 x 100 ft., 4 storeys. Date of receiving of tenders not yet decided.

Hamilton, Ont.

Architect to be chosen for public school. Owners, Board of Education, Hamilton. Building Committee authorized to engage architect to prepare plans for a 10-room school on Maple avenue and to call for tenders.

Lennoxville, Qne.

Plans in progress for academy, $18,000. Owner, Protestant school com., Lennoxville; architect, J. W. Gregoire, Sherbrooke; 3 storeys, stone and brick, 54 x 85 ft., stone foundation, electric light. Tenders received after July 1st. Time to close not fixed yet.

Little Current, Ont.

Tenders called for industrial school, $15,000, Sheshegwaning Reserve, Ont. Owner, Dept. of Indian Affairs, Ottawa. Architect, Government, 2 storeys, stone foundation, wood construction. Plans, and specifications can be seen at Ottawa or Mr. Thornburn, Indian agent, Gore Bay. Tenders received until June 26, 1911.

Merritt, B.C.

Tenders called for hospital, $16,000 Owners, Hospital Board, Merritt, B.C. Architect, Blackmore & Birds, Loo Bldg., Vancouver. 2-storey, concrete foundation, frame construction, reacolith or terrazo tiling, hospital type plumbing fixtures, hot water heating. Tenders received now by architects.

Medicine Hat, Alta.

Competitive plans called for St. Barnabas Church, $25,000; owner, St. Bannabas Parish, Medicine Hat, Alta; secretary of vestry, J. H. Collier, Medicine Hat, Alta. Tenders were received from Clemsha & Coltman, Regina. Tenders exceeded estimates. Competitive plans called not to exceed $25,000 and to include heating, plumbing, electric wiring fixtures, seating capacity, 400. Architects paid 2½ per cent. for plan and 2½ for supervision—unsuccessful sketches returned. Plans to be in by June 16th.

Moose Jaw, Sask.

Tenders called for school, $100,000. Owner, Moose Jaw school board; architect, R. G. Bunyard, Moose Jaw, two storeys and basement, reinforced concrete and brick, 137 x 82 ft., concrete foundation, fan system, heating, electric light, gas, iron roof, interior finish oak and fir. Tenders called June 12, close about the 26th.

Contemplated, new post office, $300,000. Owners, Dominion Government, Ottawa. Bids will be called for in about two weeks. Report later.

Plans in progress for church, $120,000. Owners, Trustees Presbyterian Church. Architect, F. Glemenshaw, Regina. Plans are being prepared but work will not commence until location of new railways is decided.

North Vancouver, B.C.

Architects chosen for public school (Ridgeway avenue). Owner, Public School Board. Architect. Messrs. Claude P. Jones and W. C. F. Gillam, 429 Pender street west, Vancouver. Fireproof construction, reinforced concrete faced with red brick and stone trimmings, slate roofing secured from quarries from Jervis Inlet, 16 class rooms.

Niagara Falls, Ont.

Competitive design called for rink. Owner, Niagara Falls Hockey Athletic Association Limited. Secretary, R. C. McFarlane, Niagara Falls. At a meeting of the association June 7, the secretary was instructed to invite architects to submit competitive designs for a fireproof rink not less than 75 x 180 feet seating accommodation 2,500.

Newdale, Man.

Tenders are called for school, $12,000. Owners, Municipality of Newdale; sec.-treasurer, Johnson; architect, W. A. Elliott, Brandon, Man., one storey brick and stone, 64 x 36 ft., Muller hot air heating, pitch roof. Plans accepted June 6th. Tenders called June 20th, close June 27th. Received by owners.

Ottawa, Ont.

Tenders called for heating public school, $5,000, Mutchmor street. Owner, Public School Board, C. Ross, secretary. Official in charge, W. Garvock, Elgin street school. Steam heating, direct radiation and mechanical ventilation (two boilers, 14,000 square feet floor space). Tenders received until June 15, by secretary.

Pembroke, Ont.

Tenders being called for church addition. Owner, Methodist Church, Pembroke; architect, M. C. Edey, Ottawa. The addition will be of brick.

Quebec, Que.

Tenders called for public building. Owner, Department of Public Works & Labor, Quebec, P.Q. Secretary, A. Gagnon, Que.; architect, Marchand, & Brassard, 164 St. James street, Montreal. Completion of new jail. Plans at Parliament Building and at office of architects. Tenders received until June 21, by Hon. L. A. Taschereau, Minister of Public Works, Quebec

Renfrew, Ont.

Tenders called for addition to Collegiate Institute. Owner, Board of Education, Renfrew; sec.-treas., Geo. Eady, Jr., Renfrew; architect, J. D. McNicol, Addition to be used as a gymnasium. Plans, etc., with the architect. Tenders received until June 16th by the secretary-treasurer.

Sawyerville, Que.

Tenders are called for improvements to the Model School.

Sherbrooke, Que.

Tenders called for Monastery, $75,000. Owners, Redemptorist Fathers, Ste. Anne de Beaupre, Que; architect, L. N. Audee, Sherbrooke; cut stone and brick, foundation stone, cement work, 4 storeys, reinforced concrete, fire escapes, sheathing paper, steel beams, electrical work, structural iron. Tenders close June 13th.

St. Thomas, Ont.

Tenders called for public school. Owner, Board of Education; secretary-treasurer, H. W. Talman, 460 Talbot street; architect, J. T. Finlay, Southern Loan Chambers, St. Thomas. Masonry, carpentry, slating, plumbing, plastering, painting, hot air heating, electrical and galvanized iron work. Plans, etc. with architect.

Swift Current, Sask.

Contemplated hospital, $25,000. Architects, Sharon & Darrach, Regina and Swift Current. Plans have been provisionally accepted and returned to Regina for alterations. Tenders will be called in 10 days.

Trail, B.C.

Tenders called for school. Owner, Trail School Board; secretary, F. E. Dockerill; architect, A. Carrie, Nelson, B.C.; 8 room, brick and concrete construction. Plans at office of secretary and architect after June 10. Tenders received until June 28.

Toronto, Ont.

Plans in progress for church, $10,000. Owners, Davenport Methodist Church, Davenport Road. Architect, D. E. Smith, 77 Victoria street, Toronto, brick 72 x 60, brick foundation, steam heat, electric light, felt and gravel roof, maple flooring. Tenders called shortly.

Tenders to be called for club house, $25,000; owners, Knights of Columbus, Toronto; architect, C. J. Read, Confederation Life Building; 3 storeys, brick and stone, 100 ft. x 75 ft., brick foundation, steam heat, combination lighting, felt and gravel roof, reinforced concrete. Tenders called about June 23, 1911

Plans in progress for Oddfellows Hall, $20,000; owners, Manchester Unity I. O. O. F., Toronto, architects, Ellis & Connery, Manning Chambers, Toronto; brick and stone, 50 ft. x 90 ft. stone foundation, steam heating, electric light, felt and gravel roof. Tenders called shortly.

Contemplated, church, $13,000. Owners, Dufferin Street Presbyterian Church. Architect, W. R. Gregg, 23 Jordan street, Toronto. Brick. Tenders received about August 1st.

Virden, Man.

Tenders called for opera house and telephone exchange, $25,000. Owner, municipality of Virden. Architect, W. A. Elliot, Brandon, stone and brick structure. By-law passed June 3. Bids will be called June 9, received by town clerk until June 20, 1911.

Windsor, Ont.

Tenders called for public building. $14,000. Owner, Windsor Athletic Club, Windsor, Ont. Brick and steel construction, concrete foundation, steam heating, [illegible] interior finish Georgia pine, three storeys, 51 ft x [illegible] x [illegible] ft., fire escapes, cut stone, sheet metal, iron columns, plate glass, electrical work. Tenders received after June 15, close June 20.

West Oxford Township, Ont.
Plans in progress for school, $4,000. Owner, West Oxford Township; architects, Taylor & Taylor, Brantford; 1 storey and basement, brick, cement foundation, 27 ft. x 44 ft., hot air heating, slate roof, interior finish ash, metal ceiling. Tenders received after June 15, close June 30, 1911.

AWARDED

Campbellton, N.B.
Erection of Baptist Church, $16,000. Owner, Baptist Church; chairman building committee, W. P. Gray; architect, Leslie R. Fairn, Aylesford, N.S. Work to be done by day labor.

Dresden, Ont.
General contract awarded for post office, $14,000. Owner, Dominion government; architects, Jacques & Williamson, Wallaceburg; 2 storeys, brick and stone, concrete foundation, steam heat, electric light, galvanized iron roof, marble and oak finish, 48 x 48; general contractor, J. Clarke, Dresden; sub-contract not completed.

Fort William, Ont.
Contract awarded for public school, $45,000. Owner, Board of Education; architect, R. E. Mason, Fort William; general contractor, R. McLeod, Fort William; 65 x 60 ft., 2 storeys solid brick. Tenders for heating, plumbing and lighting called in about 10 days.

Guelph, Ont.
Contract awarded for Isolation Hospital. General contractors, P. H. Secord & Sons, Brantford.

Jail & Jailers' residence, $27,277. General contractors, G. A. Scroggie.

Ottawa, Ont.
Contracts awarded for military building, $22,000. Owner, Militia Department, Ottawa. Architect, A. P. Deroche, Woods Building, Ottawa; general contractor, W. G. Adamson, Sparks street, Ottawa; four buildings, frame, 1½ storeys.

Runnymede, Ont.
Contracts awarded for school, $20,000. Owners, Runnymede School Board; architects, Ellis & Connery, Manning Chambers, Toronto; 2 storeys, brick, 90 ft. x 70 ft. General contract awarded to Guay & Shaw, Oshawa, Ont.

Revelstoke, B. C.
Contract awarded for Court House, $120,000. General contractors, Messrs. Foot & Praldelonie, Revelstoke; building to be ready by end of November.

St. George, Ont.
Contracts awarded for church, $14,200. Owner, Baptist Church; Dr. Patten, chairman building committee; architects, Taylor and Taylor, Brantford; basement stone, balance brick, 450 sittings. Mason, Thos. Hull, Lynden; carpenter, plaster, iron, stone, sheet metal, F. M. Misener, Jerseyville, Ont., heating and plumbing not yet let.

Souris, Man.
School, $32,500. Owner, Souris School Board; architect, T. Sinclair, Brandon; 2 storey brick and stone; general contractor, A. E. Bullock, Brandon, Man.; heating and plumbing not let, contract originally awarded at same figure to Piggot & Son, Hamilton, who refused to carry out.

Residences

Granby, Que.
Building in progress for residence, $3,300, Central street. Owner, Mrs. Phillip Gousy, Ste. Cecile de Milton; architect and contractor, Theo. Delorme, Granby, 2 storey, 36 x 49 ft., building to be completed July 15th. Plans prepared by contractor. Heating contract not yet let.

Ottawa, Ont.
Tenders callad for residence. Architect, J. P. MacLaren, Spark street, Ottawa; 2½ storeys, brick and veneer, hot water heating, electric light, 24 ft. x 42 ft.

Renfrew, Ont.
Plans in progress for residence, $5,000. Owner, G. McIntyre, Renfrew; architect, J. D. McNicol, Renfrew; 2 storeys, brick, cut-stone foundation, hot air heating, interior finish hardwood. Plans being drawn. Date tenders received announced later.

Toronto, Ont.
Tenders called for three dwellings, $5,000 each, Pembroke street. Owner, Hy. Niscon, 9 Gifford street; architect, P. H. Finney, 43 Victoria street; brick, stone foundation, hot water heating, gas and electricity, modern plumbing, slate or asbestos cement roof, hardwood flooring, 2½ storeys, 51½ x 62 ft. Tenders close June 20.

Tenders to be called for residence, $9,000. Owner, Mr. Humphrey, Toronto; architect, Curry & Sparling, Toronto; 2½storeys, brick and stone, 86 x 38, brick foundation, hot water heating, gas and electric light, slate roof, interior finish hardwood. Tenders called shortly.

Tenders called for two residences, $3,500 each, Woodlawn avenue. Owners Rev. W. A. Strongman, Toronto, Ont. Architect, P. H. Finney, 43 Victoria street. Two detached houses; brick, stone construction, hot water heating, gas and electric light, modern plumbing, slate roof, hardwood floors and stair, 2½ storeys, 30 ft. x 32 ft. Tenders received after June 15th.

Tenders called for apartment house, $65,000, Davenport and McAlpine. Owner, Dr. Johnson, Elm street, Toronto. Architect, W. H. Mallory, 31 Queen street west; three storeys, brick and artificial stone, 36 x 48, stone foundation, hot water heating, combination lighting, felt and gravel roof, interior finish pine. Tenders closed June 14.

Wallaceburg, Ont.
Tenders called for residence, $3,500. Owner, Charles Snively, Wallaceburg; architects, Jacques & Williamson, Wallaceburg; two storeys, brick, concrete foundation, hot air heating, electric light, interior finish, oak, 28 ft. x 32 ft. Tenders called until June 19, 1911.

Windsor, Ont.
Tenders called for residence, $4,000, Ouellet avenue. Owner, J. E. White, Windsor, Ont. Architect, Jacques & Williamson, Windsor, Ont. Two storey brick, 25 x 30, cut stone, hot water heating, shingle roof, electrical work, art glass.

AWARDED

Brantford, Ont.
Contracts awarded for residence, $12,000. Owner, Mayor M. F. Muir, Brantford; architect, L. D. Barber, Brantford; 2 storeys, brick and timber, 45 ft x 85 ft. General contractor, Schultz Bros., Ltd., Brantford. Heating and plumbing not yet let. Owner to supply shop hardware.

Hamilton, Ont.
Contracts awarded for residence, $16,000. Owner, G. G. Gurnsey, 37 James street south; architect—General contractor, G. G. Gurnsey. 100 houses will be built by the company represented by G. G. Gurnsey near the Oliver Plow Works, Ltd.

Montreal, Que.
General contract awarded for two residence flats, $6,000. Owner, architect, general contractor, Elzear Cote, 1227 St. Andre street, Montreal. 3-storeys, brick, 46 x 55.

General contract awarded for six dwellings, $10,000. Owner, architect, general contractor, L. Clement, 478 Parc Lafontaine, Montreal, 3-storeys, brick, 60 x 90.

General contract awarded for eight dwellings, $24,000, Duluth avenue. Owner, architect, general contractor, C. Martin, 678 Bourbonniere street, Montreal. 3-storey, brick, 108 feet frontage by 60 feet deep.

General contract awarded for residence, $17,000, Pine avenue. Owner, architect and general contractor, H. C. Hitch, Coristine Bldg., Montreal. 2-storey, stone front brick, 25 x 50.

General contract awarded for nine dwellings, $12,000. Owner, architect and general contractor, P. J. Charlebois, 1234 St. Hubert st eet, Montreal. 3-storeys, brick and wood, 75 feet frontage by 40 feet deep.

Business Buildings and Industrial Plants

Brandon, Man.
Contemplated, freight shed, $6,000. Owner, C. P. R. Engineer, E. Melsted, Brandon. Frame, pitch roof, 1 storey. Will be built concurrently with construction of Industrial Spur line.

Brantford, Ont.
Tenders called for bank and office building, $30,000. Owner, Royal Loan & Savings Company, Brantford. Architects, L. D. Barber & Chapman McGiffen Association, Brantford. Three storeys, 40 x 63, fireproof reinforced concrete, marble front, brick foundation, electrical work, terra cotta brick, metallic lath, pipe covering, plate glass, sheet metal work, vaults, hardwood and marble. Tenders—time for receiving extended to June 20, 1911.

Tenders called for stores and apartments, $8,000. Owner, Dr. J. W. Robinson, Brantford; architects, Taylor & Taylor, Brantford; 3 storeys, brick and stone, concrete foundation, hot air heating, electric light, modern plumbing, tar and gravel roof, pine finish (interior), structural iron, 40 x 50, vaults, metal ceiling, cornice, skylights, steel beams, iron columns, plate glass, prismatic glass. Tenders called until June 17th.

Calgary, Alta.

Tenders to be called for business block, 9th avenue. Owner, L. R. Burns, Calgary; architect, Leo. Dowler, Calgary, Alta.; foundation 99 x 110; steam heating, electric light, interior finish, fir, fire escapes. Tenders received after 1st July, close 15th July.

Elora, Ont.

Tenders called for factory, $4,000. Owner, Elora Furniture Co., Elora, Ont. Architect, W. A. Mahoney, Guelph, Ont. Frame, cement foundation, steam heating, electric light, patent roof, 2-storey, 75 x 50 feet, sheating paper, metal siding, cornice, fireproof doors. Tenders received immediately.

Fredericton, N.B.

Tenders called for passenger station. Owner, Department of Railways and Canals, Ottawa. Chairman Government Railways Managing Board, A. W. Campbell, Ottawa. Construction of station; plans, etc., with the Secretary of the Department, with the Station Master, Stellarton, and Chief Engineer, Moncton. Tenders received by A. W. Campbell until June 17th.

Granby, Que.

Building in progress for factory, $10,000, Water street. Owner, Granby Electric Web Mfg. Co., Granby; architect, J. H. Perkins, Lowell, Mass.; dimensions 52 x 90; sprinkler system, 2 storeys; building being erected by day labor by owner; all material purchased but sprinkler system.

Highgate, Ont.

Plans in progress for stores, $25,000. Owner, Dr. McPhail, Highgate. Architect, S. G. Kinsey, Chatham, Ont., stone, brick and frame, foundation stone and concrete, steam heating, electric light, 2 storeys, interior pine finish, 48 x 60, plate glass, metal ceiling, cornice, electrical work.

Montreal, Que.

Tenders called for terra cotta plant, $150,000. Owners, Montreal Terra Cotta Lumber Co. Location at Lakeside, near Montreal. Kilns, machinery and dryers required. Bids will be called for kilns at once. Received at 26 Board of Trade Building, Montreal.

Medicine Hat, Alta.

Plans in progress for office building, $20,000, 4th avenue. Owner, W. Cousins, Medicine Hat; architect, Trimble, Medicine Hat; brick, 2 storeys, concrete foundation. Plans being prepared.

New Westminster, B.C.

Contemplated office building, $150,000. Owner, People's Trust Company, head office, New Westminster, have just purchased a lot on Columbia street, 66x132. They will shortly erect a 6-storey office building. Supplementary report later.

Contemplated, office building, $150,000, (Begbie, Lorne and Clarkson sts.) Owner, Westminster District Liberal Association; secretary, J. H. Diamond.

Niagara Falls, Ont.

Contemplated, factory, $90,000. Owner, American Cyanide Co., Niagara Falls, Ont. Architect not chosen. Reinforced concrete construction. Duplication of present plant just announced. Westinghouse, Church & Kerr, likely to be general contractors.

Orangeville, Ont.

Destroyed by fire, business building, $60,000. Owner, Hurndall Novelty Furniture Company, Orangeville. 3-storey, 55 x 11, wing 45 x 55, engine house, 28 x 30, 2-storey.

Prince Albert, Sask.

Contemplated, business building, $75,000. Owner, J. S. Macdonald, Prince Albert, Sask. Architect, A. G. Creighton, Prince Albert. 6-storey fireproof construction.

Revelstoke, B.C.

Destroyed by fire, sawmill, $40,000. Owner, Dominion Sawmills & Lumber Co., Ltd. The Bowman Lumber Company has been absorbed by the above company. The question of rebuilding has not been decided.

Regina, Sask.

Tenders called for office building, Owner, Dominion Trust Co., Ltd.; architects, Storey & Van Egmond, Regina and Saskatoon. Tenders received until June 15th.

Sherbrooke, Que.

Contemplated bank building, Wellington street. Owners, Bank of Montreal; architects, Peden & McLaren, 120 St. Alexsis street, Montreal; stone building for branch.

Plans in progress for addition to foundry, Rand street. Owners, Canadian Rand Co., Sherbrooke; concrete foundation, brick, concrete and steel. Tenders called for shortly.

Plans in progress for store, $12,000. Owner, P. T. Legaru Sons, Que; architect, J. W. Gregoire, Sherbrooke. 2-storeys, brick and stone, 60 x 100, stone foundation, electric light. Tenders received after July 1st. Time to close not fixed yet.

Stellarton, N.S.

Tenders called for business building. Owner, Acadia Coal Company, Stellarton, N.S. Architect, Chas. Mitchell, care Acadia Coal Company. Vitrified brick, wash house 52 x 40, rescue station 55 x 25, lamp house 47 x 18. Tenders called until June 20.

St. John, N. B.

Tenders called for addition to brush factory. Owners, T. S. Simm & Co., St. John; architect, F. Neil Brodie, St. John, N. B., power house, boiler house, and machine shop, 48 x 55 ft. Tenders to be called this week.

Toronto, Ont.

Tenders called for store and apartment, $8,000, Bloor street. Architect, J. M. Cowan, 65 Adelaide street east; brick and stone, stone foundation, hot water heating, gas and electric lighting, modern plumbing, felt and gravel roofing, 2 storey, 21 x 75, structural iron, cornice. Tenders received afted June 12th.

Specifications in progress for offce, $5,000, Dundas street. Owner, Ryan & Son, architects, 37 Arthur street; J. N. Cowan, 65 Adelaide street; brick and artificial stone, stone foundation, hot water heating gas and electric lighting, modern plumbing, slate roof, interior maple flooring, 3 storey, 21 ft. x 60 ft. Specifications are being changed and tenders previously called, held for consideration.

Vancouver, B. C.

Tenders called for warehouse building. Owner, G. H. Cottrell, 139 Water street, Vancouver; architects, Parr & Fee, 570 Granville street, Vancouver; 5 storey brick, mill and reinforced concrete construction, concrete foundation, plumbing, heating, electric wiring.

Westport, Ont.

By-law carried for foundry, $10,000. Owner, Westport Foundry Company. The company's premises were recently destroyed by fire.

Wallaceburg, Ont.

Plans ready for store and flats, $7,000. Owner, A. Martin Wallaceburg, Ont.; architects, Jacques & Williamson, Walalceburg; 2 storeys, brick and concrete, foundation concrete, electric light, composition roof, interior Georgia pine, metal ceiling, 60 x 100 ft. To be built immediately by day work.

Winnipeg, Man.

Tenders called for car shops. Owners, Commissioners of the National Transcontinental Railway, Ottawa; secretary, P. E. Ryan, Ottawa; construction and erection complete. Plans, etc. at offices of chief engineer, Gordon Grant, Ottawa, or S. R. Poulin, district engineer, St. Bonifice, Man. Forms of tender to be supplied by W. T. Press, mechanical engineer, Ottawa.

AWARDED

Chatham, Ont.

Contracts awarded for business building, $25,000. Owner, O'Keefe & Drew. General contractor, Moore & Stephens, Chatham, Ont., 2 storeys and basement. Masonry, W. Robertson; cement, Geo. Fields; sheet metal, G. Callahan.

Contracts awarded for factory, $5,500. Owner, Wm. Gray & Sons, Campbell Co., Ltd., Chatham. Architect, T. L. Wilson & Son, Chatham. General contractor, Wm. Drader Lumber Company, Chatham; masonry and stone, Moore & Stephens, carpentry, Wm. Robertson; cement, Geo. Fielder; sheet metal, F. Callahan, all of Chatham. Dimension of Building 52 x 70, three storeys.

Hamilton, Ont.

Contracts awarded for business building, $3,000. Owner, Spectator Printing Co.; architects, Stewart & Witton, Hamilton; Prov. and Loan Bldg., Hamilton. General contractor, W. H. Cooper, 197 Emerald street west.

Montreal, Que.

Contracts awarded for C. P. R. Depot. Owner, C. P. R., Montreal. General contractor for heating system, J. Ballantyne & Co., 159 St. Antoine street. Contractor for galvanized iron pipe and installation for ventilation system, McFarlane & Douglas, Ottawa.

Contracts awarded for 10-storey office building. Owner, Henry Birks & Sons, Ltd., Montreal. Architect, Knobbs & Hyde, Montreal; excavating, masonry and plastering, James Stewart; reinforced concrete, F. J. Jago & Co.; roofing, Reed & Co., Ltd.; painting, F. Lefebure & Co., all contractors in Montreal.

Contract awarded for flour mill. Owner, Dominion Flour Mills, Ltd., Montreal; general contractor, D. G. Loomis, Cote street, St. Paul; concrete, 200 x 75 feet.

(Continued on page [illegible])

Tenders and For Sale Department

CITY OF KINGSTON

Notice to Paving Contractors

Sealed tenders by registered post only, addressed to the undersigned, will be received by the Board of Works up till 12 o'clock noon, **Saturday, June 24th, 1911**, for the construction of

15,000 square yards of asphaltic macadam;

9,700 lineal feet of curb and gutter.

Plans and specifications are also on file at the office of the Contract Record, 220 King street west, Toronto.

The lowest or any tender not necessarily accepted.

H. B. R. CRAIG,
City Engineer.

June 5th, 1911 23-24

Department of Railways & Canals, Canada

Hudson Bay Railway

NOTICE TO CONTRACTORS

Sealed tenders addressed to the undersigned and endorsed "Tender for construction of Hudson Bay Railway," will be received at this office, until 16 o'clock on **Tuesday, the 1st of August**, for a section of about 185 miles from Pas Mission to Thicket Portage.

Plans, specifications and form of contract to be entered into can be seen on and after **Wednesday, May 31, 1911**, at the office of the Chief Engineer of tne Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Hudson Bay Railway, Winnipeg, at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind, that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $200,000 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, May 26, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 23-24

Steam Shovels

We own and have for sale near Buffalo, N.Y., two Vulcan 75-ton 2½-yard steam shovels; late model, with new extra large boilers and in excellent condition; also one 70-ton. These will stand most rigid inspection and we are offering them at unusually low prices. Confer with us.

WILLIS SHAW MACHINERY CO.,
39 So. La Salle Street,
Chicago, Ill.

Contractors' Material

90 Austin 6-yd. two-way Dump Cars, 4 ft. 8½-in. gauge.

Davenport 10 x 16 Dinkey, Standard gauge.

Baldwin 16 x 24 American type locomotive, 4 ft. 8½ in.

Bucyrus 55-ton Steam Shovel, built 1903.
Marion A. A. Steam Shovel, built 1903.
Six Wheel Scrapers.

Two Lidgerwood Cableways, complete.

All of this material in Canada. No duty. Have you anything to sell? Write us.

THE MALES COMPANY,
No. 82 Perin Building,
Cincinnati, Ohio.

CITY OF PRINCE ALBERT

Tenders for POWER WORKS

Sealed tenders will be received up until noon, **Monday, June 26th, 1911**, by the Corporation of the City of Prince Albert, Province of Saskatchewan, for the construction of

Power Station Superstructure and Transmission Line

being portions of the proposed hydro-electric power development on the North Saskatchewan river at La Colle Falls (distant 25 miles east of the city).

Tenders are invited on each separately and must be plainly marked on the outside of envelope and addressed to the Secretary-Treasurer, City of Prince Albert, Saskatchewan.

Each tender must be accompanied by an accepted bank cheque for $500, payable to the Secretary-Treasurer, which cheque will be returned to the bidder unless he fails to execute a contract should it be awarded to him.

The successful bidder on each of the works will be required to execute a bond in the sum of $3,000 for the faithful performance of the contract.

The city reserves the right to reject any or all tenders.

The plans and specifications will be on file and may be seen on and after **June 8th, 1911**, at the City Hall, Prince Albert; office of "Canadian Engineer" at Winnipeg and Montreal, or at the offices of the Engineers, C. H. and P. H. Mitchell, Traders Bank Building, Toronto.

ANDREW HOLMES, Mayor.
C. O. DAVIDSON, Secretary-Treasurer.

Prince Albert, Sask.
June 1st, 1911. 23-24

Tenders for Sidewalks

will be received by the undersigned until 8 p.m. of **Monday, the 19th June, current**, for the construction of $3,000 worth of Cement Sidewalks.

A marked cheque for $50 must accompany tenders.

The lowest or any tender not necessarily accepted.

For specifications apply to

D. H. MINAKER, Town Clerk,
Cobourg, Ont.

June 11, 1911 23-24

TOWN OF BATTLEFORD

Saskatchewan

Sealed tenders, addressed to the Town Council of Battleford, will be received until noon, Monday, June 19th, for material and construction of a waterworks and sewerage system.

Plans may be seen and schedules of quantities, specifications, etc., obtained at the office of the Town Engineer.

Each tender must be accompanied by an accepted bank cheque on a chartered Canadian bank equal to five per cent. (5 per cent.) of the contract price.

H. C. ADAMS,
Secretary-Treasurer.
WM. KITSON,
Town Engineer.

23-24

CITY OF TORONTO

Tenders For a Steel Span

Over the Tracks of the C.P.R At Weston Road

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on **Tuesday, June 20th, 1911**, for the construction of a steel span crossing the tracks of the C. P. R. at Weston Road, in the City of Toronto.

Envelopes containing tender must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained upon application to the Department of Railways, Bridges and Docks, City Engineer's Office, Toronto.

The tenderers shall submit with their tender the names of two sureties (approved of by the City Treasurer, not members of the City Council, or officers of the Corporation of the City of Toronto), or in lieu of said sureties, the bond of a guarantee company approved of as aforesaid.

The lowest or any tender not necessarily accepted.

F. S. SPENCE,
Chairman of the Board of Control.

City Hall, Toronto, May 29, 1911. 23-24

Tenders Wanted

Sealed tenders will be received by the undersigned, up to **Friday, June 23rd,** at one o'clock p.m., for the construction of one 10-foot span flat top concrete bridge and one 45-foot span steel bridge on concrete abutments for the County of Wellington, also one 32-foot span concrete girder bridge and one 70-foot span steel bridge on concrete abutments for the Township of Minto.

Plans and specifications for both concrete and steel work can be seen at the office of W. D. McLellan in the Town of Harriston, where the tenders will be opened.

The lowest or any tender not necessarily accepted.

Tenderers will be required to furnish satisfactory security for the fulfilment of their contracts.

H. GRAEF,
Chairman Boundry Line Bridge.
Clifford, Ont.
W. D. McLELLAN,
Clerk of Minto,
24-25 Harriston, Ont.

Tenders

For the Construction of a Reinforced Concrete Subway

Sealed and endorsed tenders addressed to the Chairman of the Utilities Committee will be received at the office of the City Clerk up to 5 o'clock p.m., **June 30th, 1911**, for the construction and supply of all materials in connection therewith.

Plans, specifications and forms of tender may be obtained at the office of the City Engineer, Fort William; the office of the Contract Record, 220 King street west, Toronto; Canadian Engineer, 62 Church street, Toronto, or Builders' Exchange, Winnipeg.

The lowest or any tender not necessarily accepted.

JOHN WILSON,
City Engineer.
City Engineer's Office,
May 16th, 1911. 22-24

CITY OF TORONTO

Tenders

For the Construction of a Concrete Floor Slab and a Reinforced Concrete Bent at the Western Road Bridge

Tenders [illegible] only, addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on **Tuesday, June 20th, 1911**, for the construction of a concrete floor slab on a steel span crossing the tracks of the C. P. R. at Weston Road in the City of Toronto, and a reinforced concrete bent under the north end of the said steel span.

Envelopes containing tender must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained upon application to the Department of Railways, Bridges & Docks, City Engineer's Office, Toronto.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman of the Board of Control.
City Hall, [illegible]
[illegible] 1911 [illegible]

Notice to Contractors

Sealed bulk or separate tenders will be received up till 3 o'clock p.m. June 20th, addressed to the undersigned for the erection of a Bank Building, for the Royal Loan and Savings Company, Brantford.

Plans may be seen at the office of L. D. Barber, architect, Brantford, or Chapman, McGiffin & Scott, architects, Toronto.

The lowest or any tender not necessarily ac[illegible]

L. D. BARBER, architect,
Temple Building, Brantford. 24-24

TENDERS

Sealed tenders addressed to the undersigned will be received until 5 o'clock p.m. on Saturday, June 24th, for the construction of a reinforced concrete coagulating basin, of a capacity of approximately 400,000 gallons, at the St. Thomas Waterworks.

Plans and specifications may be seen and form of tender obtained at the office of the City Engineer.

The Commission does not bind itself to accept the lowest or any tender.

GEO. K. CROCKER,
Chairman Waterworks Commission.
St. Thomas, June 9, 1911. 24-25

Department of Railways and Canals

Intercolonial Railway

Improvements at Halifax

Sealed tenders addressed to the undersigned and endorsed "Tender for Pier and Sheds," will be received at this office until 12 o'clock noon of the **20th day of July, 1911**, for the construction of a reinforced cement concrete pier and sheds at the Deep Water Terminus of the Intercolonial Railway, at Halifax.

Plans, specifications and form of contract to be entered into may be seen and full information obtained on and after the 20th day of June, 1911, at the office of the Chief Engineer, of the Department of Railways and Canals, Ottawa, Ont., and at the office of the Chief Engineer of the Intercolonial Railway at Moncton, N.B., or at the office of the Consulting Engineer, Mr. John Kennedy, Montreal.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $25,000, made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the [illegible]

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

[illegible]

By order,
[illegible]

Department of Railways and Canals.
Ottawa, June 5th, 1911.

[illegible] out authority from the Department will not be [illegible]

Tenders for Bridges

Tenders will be received by the undersigned until **Saturday, July 1st,** for the concrete work for a steel bridge to be erected in the Township of Burford, Ont.

Plans and specifications may be seen at any time at my residence, Cathsart, Ont.

W.M. [illegible]
24-25 R[illegible]

TOWN OF VIRDEN

Debentures

Sealed tenders will be received by the undersigned until noon **Thursday, July 6, 1911**, for the purchase of an issue of twentn years debentures of the Town of Virden to the value of $25,000, bearing interest at 5 per cent. dated July 2, 1911, with equal annual payments of principal and interest.

The said debentures covering the cost of construction and finishing of certain additions to the present municipal building, etc.

Offers to be made payable net, at the Canadian Bank of Commerce, Virden, Man.

Valadity of said debentures guaranteed by the Municipal Commissioner of Manitoba. Tenders to be marked "Tenders for Debentures." The highest or any offer not necessarily accepted.

J. F. C. MENLOVE,
Sec.-Treas Town of Virden.
Virden, Manitoba. 24-25

CITY OF PORT ARTHUR

Tenders for Pavement

Sealed separate tenders, endorsed on envelope, "Tender for Paving," will be received by the undersigned up to 6 o'clock p.m. of **Saturday, June 24th, 1911**, for the paving of streets in the city of Port Arthur as undernoted:

1. Bay street, Cumberland to Algoma:
   With Asphalt Block, Sheet Asphalt and Bitulithic, and laying and paving street car tracks according to Engineer's plans, etc.
   Estimated quantities: -
   Pavement, approximately 4,784 sq. yds.
   Curb and gutter, approximately 2,930 lin. ft.
   Track construction, approx. 3,166 sq. yds.
2. Similar tenders for Algoma st., Bay to John:
   Estimated quantities:—
   Pavement, approximately 4,100 sq. yds.
   Curb and gutter, approximately 3,060 lin. ft.
   Track construction, approx. 3,378 sq. yds.
3. Similar tenders for Algoma st., John to Queen.
   Estimated quantities:
   Pavement, approximately 1,685 sq. yds.
   Curb and gutter, approximately 940 lin. ft.
   Track construction, approx. 845 sq. yds.
4. Similar tenders for Pearl street, South Water to Court:—
   (No Street Car Tracks)
   Estimated quantities:
   Pavement, approximately 4,360 sq. yds.
   Curb and gutter, approximately 1,836 lin. ft.
5. Similar tenders for Cameron street, Cumberland to Court:
   (No Street Car Tracks)
   Estimated quantities:
   Pavement, approximately 1,780 sq. yds.
   Curb and gutter, 1,340 lineal feet.

This latter street to include tender for construction with RocMac.

All tenders must include construction of proper curbs and gutters.

Further instructions as to specifications and [illegible] Engineer.

A marked cheque for ten per cent. of the es[illegible] tender.

[illegible]

Bridge Tenders

[illegible] tenders will be received by William [illegible], [illegible], for the building [illegible] 30 foot concrete arch bridge on [illegible] near Osha[illegible] Friday, June 30th.

[illegible] apply to the undersigned.

BOWMAN & CONNOR, Engineers,
[illegible] 36 Toronto Street, Toronto.
H. GIFFORD, Reeve,
Cedardale, Ont.

TENDERS
for Steel and Concrete Bridge
Mud Lake Narrows
TOWNSHIP of CARDEN
County of Victoria

Tenders will be received by the undersigned until **Wednesday, July 5th, 1911**, for the following works:

1. Two steel spans with concrete floors, each 60 feet over all, 14 feet roadway between curbs, to carry a 10-ton roller at least, and to be approved by the Engineer of Highways of the Department of Public Works of Ontario.
2. One 120 feet span, same width and relative strength.
3. Three concrete piers to receive two 60-ft. spans.
4. Two concrete piers to receive one 120-ft. span.
5. Stone filling of approaches.

Plans and specifications may be seen at the office of the County Clerk, Lindsay and Whitby.

The committee claims the right to accept a tender for either two spans or one span; three piers or two piers and to decline any or all of the tenders.

J. R. McNEILLIE,
Clerk, County of Victoria.
Lindsay, June 12, 1911.

Sealed tenders addressed to the undersigned, and endorsed "Tender for Breakwater at Bare Point, Port Arthur, Ont.," will be received at this office until 4 p.m., **Wednesday, July 5, 1911**, for the construction of a Breakwater at Bare Point, Port Arthur, Electoral District of Thunder Bay and Rainy River, Ont.

Plans, specifications and form of contract can be seen and forms of tender obtained at this Department and at the offices of E. B. Temple, Esq., District Engineer, Port Arthur, Ont.; J. G. Sing, Esq., District Engineer, Confederation Life Building, Toronto; H. J. Lamb, Esq., District Engineer, London, Ont.; and J. L. Michaud, Esq., District Engineer, Merchants' Bank Building, St. James street, Montreal, Que.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation, and place of residence of each member of the firm must be given.

Tenders are asked for two modes of construction, and each contractor must send in with his tender an accepted bank cheque on a chartered bank, payable to the order of the Honourable the Minister of Public Works, equal to ten per cent. (10 p.c.) of the amount of the higher of the bids, which cheque will be forfeited if the contractor decline to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,
R. C. DESROCHERS,
Secretary.
Department of Public Works,
Ottawa, June 2, 1911.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 23-24

Bridge Tenders

Sealed tenders will be received by the Clerk of Markham Township, Unionville, Ont., for the building of a steel superstructure with concrete abutments for a concrete arch in the Township of Markham, near Thornhill, up to noon on **Friday, June 30th.**

For further information apply to

BOWMAN & CONNOR, Engineers,
24-25 36 Toronto Street, Toronto.
J. PAGET,
Thornhill, Ont.

Toronto Main Drainage

Low Level Interceptor:
Section No. 4, 3,244 linear feet, 4 ft. 9 in. circular brick in tunnel.

Storm Overflow Sewers:
Wilton, Section No. 1, 4,499 linear feet, average nominal size 5 ft. x 5 ft. 6 ins., brick or concrete in tunnel.
Wilton, Section No. 2, 3,562 linear feet, average nominal size 4 ft. x 4 ft. 3 ins., brick or concrete in tunnel.

Sealed tenders for the construction of the above concrete and brick sewers complete will be received by registered post only, addressed to the Chairman of the Board of Control, Toronto, Ontario, up to noon of **July 4th, 1911.**

Plans and specifications are on file at the office of this journal in Montreal. Plans may be seen and specifications and further information may be obtained from the Main Drainage Works, City Engineer's Office, Toronto.

G. R. GEARY, Mayor,
Chairman, Board of Control.

TOWN OF THOROLD
PROVINCE OF ONTARIO
Sewerage Works
Notice to Contractors

Sealed tenders will be received by the Town Clerk until 8 p.m. on **Monday, June 26th, 1911,** for the labor and materials required for the construction of a System of Sanitary Sewers, comprising about 13,000 lineal feet of pipe sewers.

Plans and specications may be seen at the office of the Engineers, Mail Building, Toronto.

Deposit cheque for $1,500 required for labor, and $500 for sewer pipes.

The lowest or any tender not necessarily accepted.

A. McCULLOCH, Esq., Mayor,
Thorold, Ont.
CHIPMAN & POWER, Engineers,
24-25 Toronto, Ont.
D. J. C. MUNRO, Esq., Town Clerk,
Thorold, Ont.

TOWN OF OSHAWA, ONT.
Sedimentation Tanks, etc.

Sealed tenders, accompanied by a marked cheque for $500 will be received up to **Saturday noon, July 1st, 1911,** for the construction of screening chambers, sedimentation tanks, sludge beds and all appurtenances thereto.

Plans and copies of specications are held for inspection at the offices of the "Contract Record," 220 King street west, Toronto; the "Canadian Engineer," Church street, Toronto, and the office of Mr. T. Aird Murray, C.E., Consulting Engineer, Lumsden Building, Toronto.

Copies may be obtained from the Town Engineer, together with forms of tender, upon deposit of a fee of $1.00, which will be returned when plans are returned.

W. E. N. SINCLAIR, B.A., L.L.B.,
Mayor.
FRANK CHAPPELL,
Town Engineer.
Town Hall, Oshawa.

Miscellaneous

Advertisements under this heading two cents per word per insertion. Minimum charge 50 cents

REPRESENTATIVE WANTED

An American company manufacturing Thomas Locking System special Sectional Sheared Bar for reinforcing concrete, want an engineer to handle the sales end of their business on shares. Address, Box 282, Contract Record, Toronto, Ont. 23-24

REPRESENTATIVES WANTED

Large American firm manufacturing a product for making dustless roads desires to secure competent representatives in eastern and western Canada who have connection with municipal authorities and town and city engineers. A1 proposition. Apply Box 284, Contract Record, Toronto, Ont. 23-24

Permeability of Concrete

That brick pavements, and in fact, pavements made of all kinds of material, expand with the heat and contract with the cold is, of course, well known; such expansion in some instances resulted in the arching of a pavement, the centre lifting in some cases several inches from the foundation. We do not recall, however, having seen any figures as to the actual amount of expansion and contraction caused in pavements by temperature changes. An investigation of the amount of such movement is being undertaken by the United States Bureau of Standards, which has sent from Washington two of its engineers to study the brick speedway at Indianapolis, which is considered perhaps the most perfect specimen of brick paving in the country. From the results of these tests it should be possible to estimate with more exactness the size of expansion joints which it is necessary to provide in constructing brick pavements of various widths and in various climates.

At the same time these engineers propose to test the rigidity of the pavement—that is, the deflection occasioned by the passing of a load over it. For this purpose a sensitive spirit level will be used which will indicate a change in level at one end of one ten-thousandth of an inch. This would not seem to have as much immediate value to the engineer, although it may serve to indicate the value of certain coefficients of elasticity and other properties of brick pavements.

Business Notes

Laferriere & Frere, Montreal, Que., dissolved.

W. A. Kenny, Ltd., Kazabazu, Que., incorporated.

Caron & Rioux, plasterers, registered, Montreal.

O. Cauchon & Co., painters, registered, Montreal.

Lemoyne & Desy, Montreal, contractors. Dissolved.

MacLean Daily Reports

The only systematic method yet devised for reporting BUILDING AND ENGINEERING projects from their inception to completion. Ask us for Rates and Specimen Reports.

220 King Street West - TORONTO

BOILERS

Fitzgibbon Type of Boilers built for McLachlin Bros., Arnprior, Ont.

BOILERS, of All Kinds for Any Service

"Inglis" Boilers are Designed and Built by Skilled and Experienced Workmen.

"Inglis" Boilers are Built of the Best Material that can be procured.

"Inglis" Boilers are Made in Shops Equipped with the Latest and Most Modern Machinery.

Workmanship, Quality, Quick Delivery and Fair Prices, together with Fifty-Two 52 Years' Practical Experience, have made "INGLIS" Boilers the "Standard." Write us for prices.

The John Inglis Company
Engineers and Boilermakers Limited
14 Strachan Ave., TORONTO, Canada

Business Buildings and Industrial Plants

(Continued from page 61)

Moose Jaw, Sask.

General contract awarded for business building, $[illegible]. Owners, Times Printing Co., Ltd., Moose Jaw; architects, Storey & Van Egmond, Regina, Sask., 6 storey brick and reinforced concrete; general contractor, Peter Lyall & Company, Montreal. No information as to sub-contractors. Report later.

General contract awarded for office and warehouse, $20,000. Owner, Massey Harris Co., Ltd., Regina; architect, R. G. Bunyard, Moose Jaw, 3 storeys and basement, brick and stone, 28 x 98 ft. General contractor, A. B. Fleming, Regina, Sask.; awarded June 6, 1911.

Sherbrooke, Que.

Contracts awarded for addition to new Sherbrooke House, $15,000. Owner, H. Higgins, St. Johnsbury, Vt.; architect, C. E. White, Sherbrooke, Que., 1 storey added; brick 80 x 40 ft.; general contract let June 8 to Sherbrooke Construction Co. Building to be completed Aug. 20th.

Contracts awarded for addition to factory, $8,000. Owner and architect, The MacKinnon Holmes Co.; Sherbrooke; general contractor, Sherbrooke Construction Co., Sherbrooke. Concrete brick and steel, 100 ft. x 50 ft., 1 storey. Contract was let June 1. Work is being done on unit basis.

Three Rivers, Que.

Contract awarded for pulp and paper mill, to General contractor C. E. Deakin, 11 St. Sacrament street, Montreal. Cement, style of mill, 100 ton Kraft paper, 50 ton unit for paper to be ready Oct. 3; 50 ton unit for paper to be ready in spring; building to be completed Oct. 1, 1911. Owner, Wayagamack Pulp and Paper Co., Ltd., Montreal.

Power Plants, Electricity and Telephones

Stettler, Alta.

Tenders called for electric light equipment. Owner, Town of Stettler, Alta.; town commissioner, Daved Mitchell, Stettler, Alta.; engineers, The John Galt Engineering Co., 317 Portage avenue, Winnipeg, Man. One 125 K.V.A. generator, exciter and switchboard; one tandem compound steam engine; one 72-in. x 16 ft. boiler and stack; cedar poles and pole-line material; erection of pole line. Specifications, etc., at offices of the engineers. Tenders called July [illegible] 1911.

Whitby, Ont.

By-law carried for power company. Parties interested, Seymour Electric Power Co., and Town of Whitby. The agreement to supply power to the town wat ratified.

Miscellaneous

St.John, N. B.

Contemplated garbage disposal plant. $50,000. Owners, City of St. John; city engineer, William Murdock. Enquiries being instituted.

Winnipeg, Man.

Tenders addressed to chairman, board of control, will be received until July 3rd for supply of apparatus and materials required for installation of police patrol telegraph system. Specifications, etc., at office of F. A. Cambridge, city electrician; M. Peterson, secretary.

The municipality of Springfield has a choice of four offers to supply light, heat, power and electric railway service. These include offers from the Winnipeg Street Railway Company and from Mr. Charles Chamberlain, representing the Great Falls Power Company.

Manager Wilford Phillips, Winnipeg Electric Street Railway Company, has organized an educational campaign to assist teachers in the public schools to teach the children how to prevent accidents. His plans have been outlined to Mr. D. McIntyre, superintendent of schools, who will seek the co-operation of the teachers.

New Companies

John Morrow Screw & Nut Co., Ltd., Ingersoll, Ont., incorporated. Incorporated, capital $100,000. Incorporators, W. L. Carr and F. C. Gullen, of Toronto.

Art Metals, Ltd., Toronto, Ont., incorporated, capital $40,000. Incorporators, D. G. Hagarty and R. C. Darling, both of Toronto.

Sweet Machinery & Foundry Co., Ltd., Cobalt, Ont., incorporated, capital $40,000. Incorporators, W. R. Sweet and J. T. Sweet, both of Cobalt.

St. Mary's Portland Cement Co., Ltd., Toronto, Ont., incorporated, capital $500,000. Incorporators, H. E. Rose and G. H. Sedgewick, both of Toronto.

J. Lefebvre, Limited, Montreal, incorporated, to carry on business as master plasterers, and general contractors, capital $100,000. Incorporators, J. P. Lefebvre and Joseph Lefebvre, both of Montreal.

Dominion Explosives, Ltd., Ottawa, Ont., incorporated, capital $100,000.

Prince Rupert Hydro-Electric Co., Ltd., Montreal, incorporated, capital $5,000,000. Incorporators, O. B. MacCallum and G. V. Cousins, both of Montreal.

Canadian Electric Welding Co., Ltd., Montreal, incorporated, capital $500,000. Incorporators, G. V. Cousins and E. G. T. Penny, both of Montreal.

Rust, as shown in Removal of Seventeen-Storey Building

The Gillender Building, a seventeen-storey structure at the northwest corner of Wall and Nassau streets, New York city, was built in 1896, and removed in 1910.

When built, all the columns were encased in solid brick work. The steelwork received one coat of paint in the shop and two after erection, but on removal, showed little evidence of ever having been painted at all.

From the top to the bottom, wherever the spaces between the brick and steel were filled with Portland cement mortar, there was no rusting, but, wherever the mortar did not fill such spaces completely, rusting had begun. Generally, the under sides of the top and bottom flanges of the floor-beams had begun to show rust, while the web and upper surfaces, having been in contact with mortar, were in good condition.

The worst rusting of all was from the sixth floor down, on the northeast corner, where the columns had been against the adjoining building, on the north side. The cover-plates of these columns looked as if they had never been painted but had stood in the open, exposed to all weather, for six or seven years. On these columns one-half, in volume, of many rivet heads could easily be removed.

This building had been erected by first-class contractors and with first-class materials; and although the rusting had not yet made the building unsafe, there is no telling how soon it would have become so.

It would seem that if the columns had been encased and filled with wet concrete there would have been little danger of rust, and they could thus have been easily protected from electrolysis. Oil or oil paints should not be placed on steel to be thus encased.

Tabulated Report from Vancouver on the Tenders for Steel Pipe

Name	price per ft. Shell 30" 5/16"	price per ft. 34" 5/16"	price per ft. 34" ⅜"	price per ft 18" ⅜"
Macdonald Godson Co., City	$3.58	$4.00	$4.96	$2.82
John Coats & Co.	3.88	4.25	5.42	2.76
Balfour Guthrie Co.	3.645	4.192	5.037	2.68
W. Beverley Robinson	3.813	4.523	5.263	2.768
J. Coughlan & Sons	4.25	4.6	5.4	3.2
C. Gardiner Johnson	3.89 1/6	5.67⅛	6.99 13/20	4.00⅛
McDougall Jenkins, Ltd.	5.0452	4.5668	5.44445	2.7574
F. Darling	4.58	5.12½	5.89	3.11½
Robertson Godson Co.	3.80¾	4.53½	5.38½	2.812/3
Evans, Colman Evans	4.53		6.17	3.15
Drummond McCall & Co.	3.8	4.3	5.13	2.96
Clayton Sons & Co.	4.38	5.04	5.77	3.6
Canadian Bovine Co.	4.23	4.73	5.44	2.97

8. Re tenders for Cast Iron Pipe.

The following tenders were received for 18 in. Cast Iron Pipe and referred to Engineer Burwell to tabulate:

	price per ton		price per ton
Evans, Coleman Evans	$36.58	Cochrane & Co.	$40.40
Balfour Guthrie & Co.	25.15	Camden Iron Works	55.50
A. F. Forsythe	45.90	Robertson Godson Co.	37.05
The Canadian Bovine Co.	45.80	C. Gardiner Johnson Co.	45.10
Anglo American Supply Co.	40.19	Drummond McCall Co.	36.50

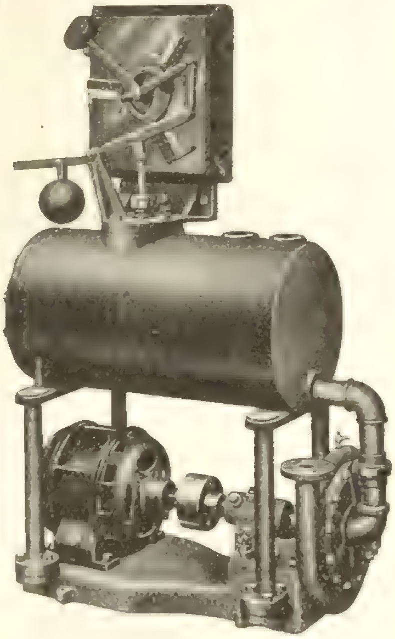
CENTRIFUGAL PUMPS

Built from the designs of our consulting engineer, Mr. W. C. Brown, formerly chief engineer for Henry R. Worthington, New York.

The illustration shows a simple and effective meams of draining steam cylinders, heating systems, steam coils, etc., automatically.

Works:
512 William Street, Montreal

Sales Offices:
Montreal, Toronto, Cobalt, Winnipeg, Calgary, Vancouver

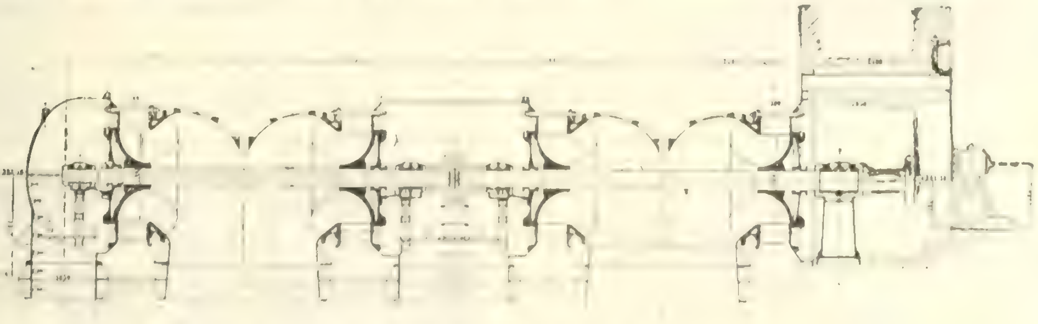


THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

LIMITED

WATER - POWER PLANTS LOW PRESSURE TURBINES

Any Output. 5,000 Turbines Supplied. 2,000,000 Horse Power.



26 ft. Head. 5,000 H. P.

Four Units as illustration on order for the German-Swiss Water Power Company

ESCHER WYSS & CO. - ZURICH, SWITZERLAND

CANADIAN HEAD OFFICE, 408 LUMSDEN BUILDING, TORONTO

PHONE, ADELAIDE 234

RAILWAY CONSTRUCTION PLANT

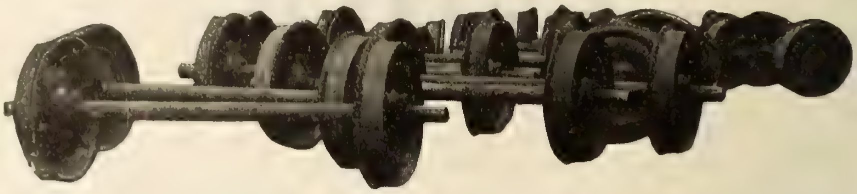
Hoisting Engines, Horse Powers, Hand Winches, Derricks, Car Wheels, Axles and Boxes, Dump Cars, Rail Cars, Buckets

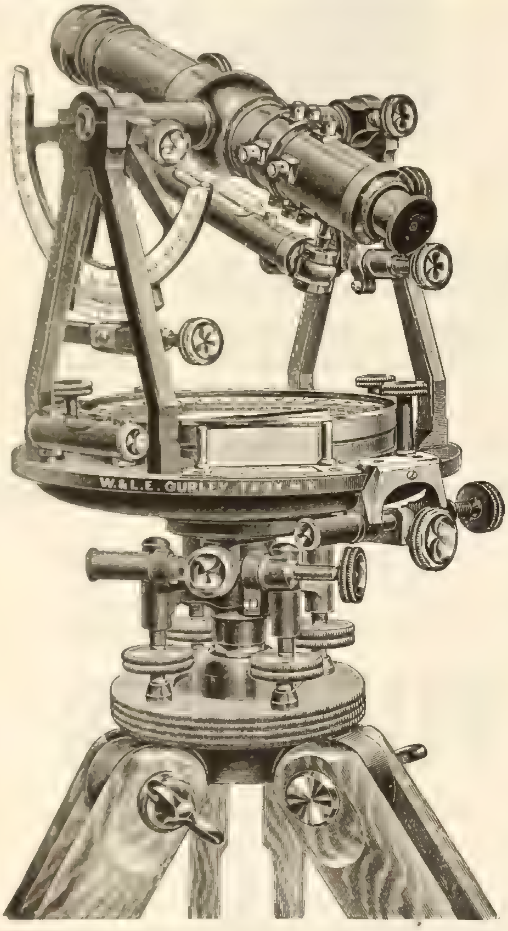
MARSH & HENTHORN, Limited

Makers of Hoisting Machinery, BELLEVILLE, ONT.

Send for Catalogue

SALES AGENTS
MUSSENS
LIMITED
Montreal, Que.





1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

- Transits
- Y Levels
- Compasses
- Plane Tables
- Current Meters
- Levelling Rods
- Chains
- Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

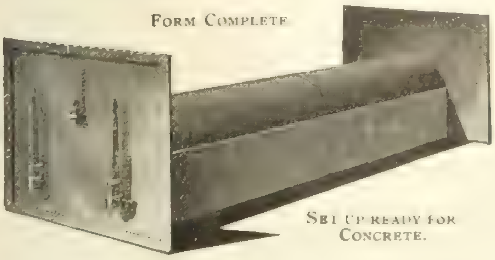
Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO
Branches: Vancouver and Winnipeg
Montreal

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.



Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

WRITE FOR FORM CATALOGUE
ENGINE CATALOGUE FOR THE ASKING
COMMISSIONER'S TIME BOOK FREE

Concrete Form & Engine Co.

Successor to Collapsible Steel Form Co.

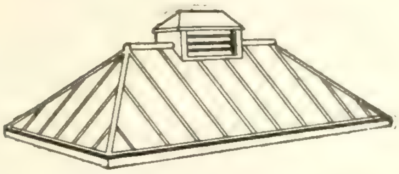
83 Congress St. W., Detroit, Mich.

"A work ill done must be twice done—only the best gives satisfaction."

—The Philosopher of Metal Town.

Metallic Skylights

Are Practically Imperishable



The framework is of hollow metal, galvanized steel or sheet copper and when glazed with **wire glass** is **absolutely fireproof.** We make all shapes and sizes.

The exclusive features of "Metallic" Skylights make for permanency and absolute satisfaction. See that they are specified in contracts.

Information and prices on request.

Manufacturers 1953

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

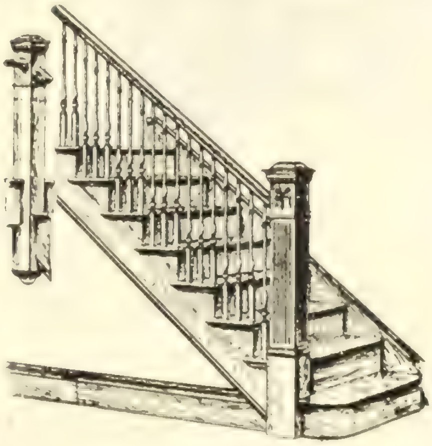
Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City



We make a **Specialty** of **STAIR WORK**

and are well equipped to fill your orders both promptly and properly.

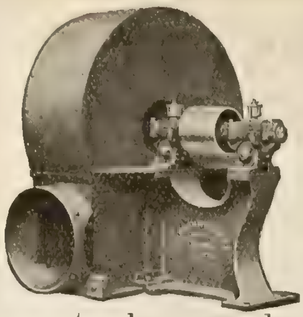
Send along your plans and specifications and let us quote you.

Bryan Manufacturing Co.
Limited
COLLINGWOOD, ONTARIO

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.



Sturtevant
Stock Fans

Embrace such a diversity of types and sizes that nearly any ordinary conditions of fan engineering may be met by a fan shipped from stock.

Spare parts always ready for immediate shipment.

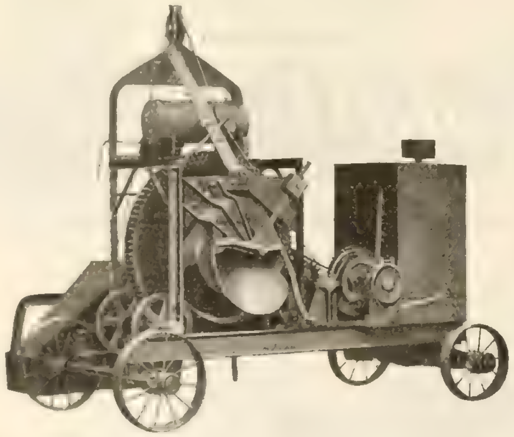
STURTEVANT Engineers suggest and recommend apparatus to meet requirements.

ASK THEM. 863

B. F. STURTEVANT, Hyde Park, Mass.
Polson Iron Works Ltd., Toronto Eadie-Douglas Ltd., Montreal

The Foote Concrete Mixer
For
STEAM — GASOLINE — ELECTRIC — BELT
POWER

Low Charging—Thorough and Rapid Mixing—
Rapid Discharge



Any capacity, and special designs for special conditions

The General Machinery Co., Ltd.
526-7 Traders Bank Building
TORONTO, ONT.

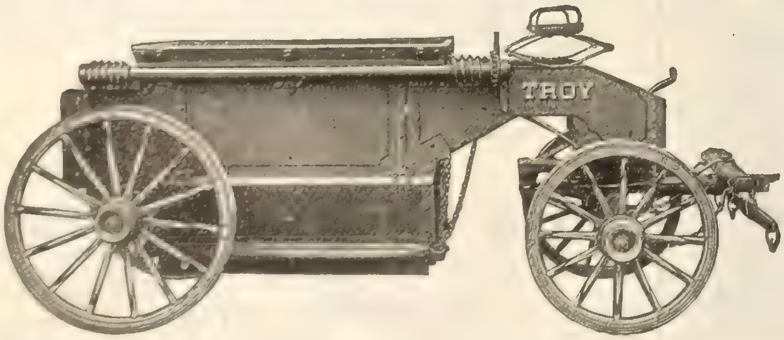
Armstrong
CRANES

Built for Every Service
up to 75 tons capacity

Electric Traveling Cranes, Standard
Electric Traveling Cranes, Special
Electric Gantry Cranes
Electric Jib Cranes
Hand Operated Cranes
Locomotive Cranes
Hydraulic Cranes

H. J. ARMSTRONG
Engineer and Manufacturer
Parkdale, Ont., Can.

"HOW SOON CAN YOU SHIP ?"

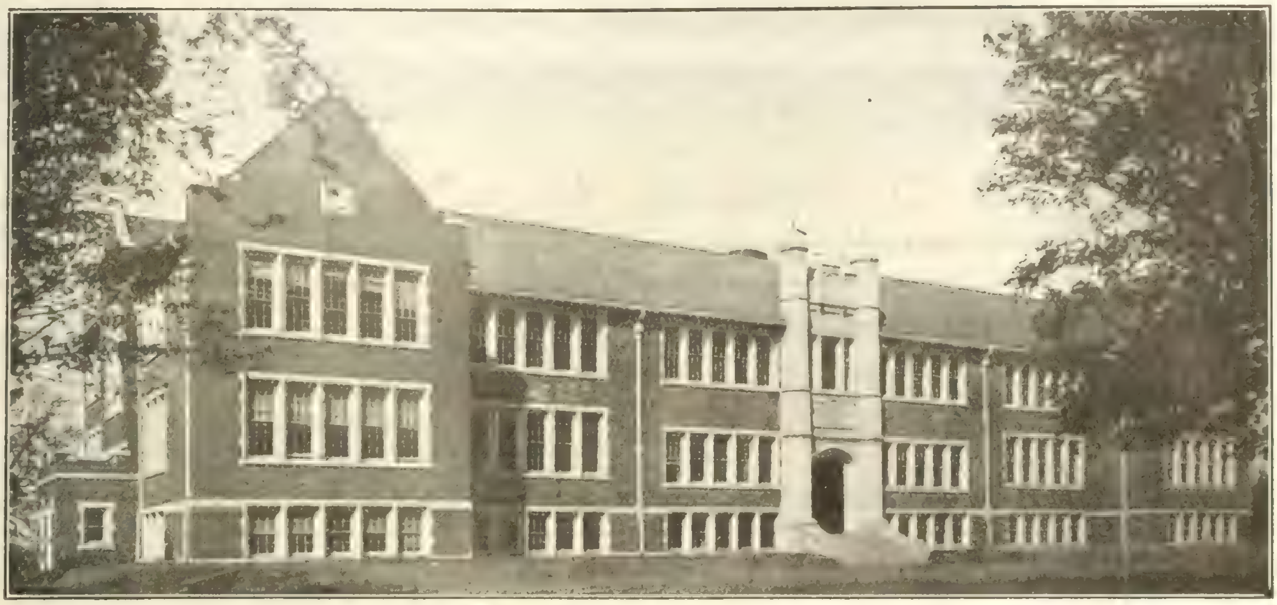


is the contractor's first question when he orders Dump Wagons. The best wagon on earth won't do him any good unless he can get it quick.

In a city near you, or perhaps in your very city, there is a big stock of TROYS on hand for immediate delivery. Every section of the country has its TROY depot. Shall we quote you price and tell you how soon you can get TROY wagons? Get Catalog 22.

The Troy Wagon Works Co.
N. Market Street, Troy, Ohio

Hamilton Pressed Brick



New Collegiate Institute, Brantford, Ont. Chapman & McGiffen, Architects, Toronto

For Clean Brick-Work

This brick is free from so-called soda. After twenty years it will look as clean and fresh as the day it is delivered. Hamilton Pressed Bricks are uniform in size and color. The illustration shows a neat, clean cut job obtained with our brick. Specify **more** than "Brick" make it **"Hamilton Pressed Brick."**

Besides furnishing a high class product we can fill your orders promptly. Connections with T. H. & B., C. P. R., G. T. R., M. C. R

Hamilton Pressed Brick Company

Limited

Phones
Factory 1992
Office 2931
Residence 345

Spectator Building, Hamilton, Ont.

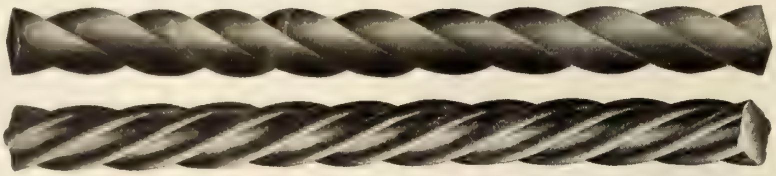
Toronto Representative, WALTER HUNTER 105 MacDONALD AVE.
Montreal, STINSON-REEB CO., Eastern Townships Bank Building.

Steel Bars for Reinforcing Concrete

Plain, Round, Square, Flat, Twisted and Spiral Bars. Channels for Fireproofing

Squares and
Rounds
3-8 in. to
1 1-4 in.

Elastic Limit
50,000 lbs.
or Higher



HIGH ELASTIC TWISTED BARS FOR REINFORCING CONCRETE

Immediate
Shipment
from
Stock

Cut to
Required
Lengths

BUFFALO STEEL CO., Tonawanda, N.Y. "Suburbs of Buffalo, N.Y."

Toronto Office
117 Home Life Building

Producers of the Celebrated

"Peerless"
Bedford Stone

Bedford Indiana
Limestone

Mill Blocks
Sawed Planed and Turned Stone

W. McMILLAN & SON
(Incorporated)

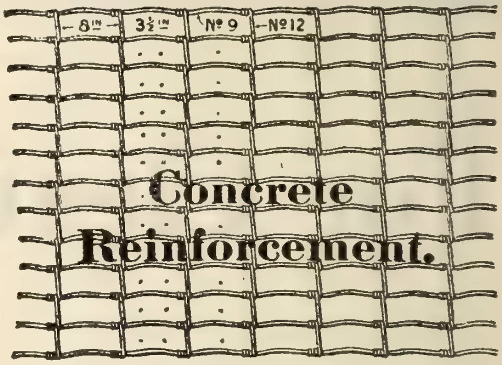
General Offices
Chamber of Commerce Building
CHICAGO, ILL.

Quarries and Mills { Bedford, Ind.
Bloomington, Ind.

Concrete Reinforcement

In 3¼ ft. Rolled Units

Page Concrete Reinforcement with a 3½ x 8 mesh, and running wires of 2,200 lb. tensile strength is used on the Harbour Commission Elevator, Montreal, Soulanges Canal, etc. It replaced on the Chambly Dam reconstruction on the Richelieu, a reinforcing that failed, although of large reputaton. This is proof of its quality. It really reinforces concrete work under heavy stresses.



Put up in rolls for easy transportation. Running wires of high carbon steel, not bent or kinked, and of full strength. For adaptable and safe reinforcing of concrete, in dam, retaining wall, and bridge work, factory and foundation work, etc.

PARTICULARS, QUOTATIONS AND SAMPLE ON REQUEST.

Page Wire Fence Company, Limited
Walkerville, Ont.

Toronto Montreal St. John

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY
H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

---

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

"Hammer Brand"
Hard Wall Plaster

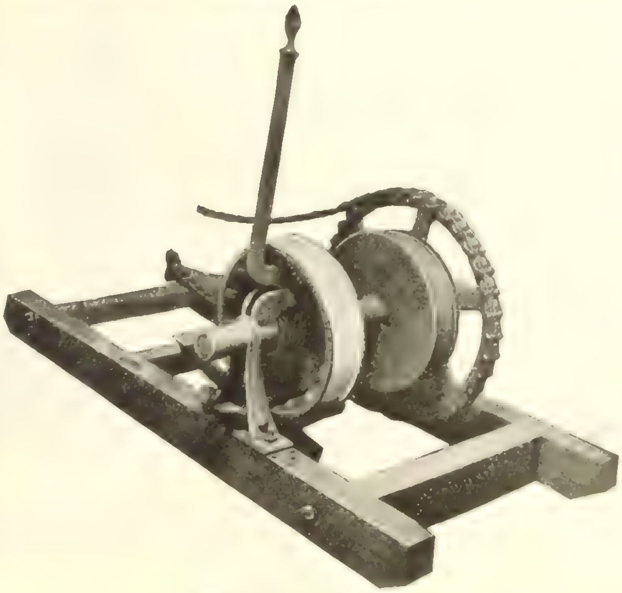
It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.

Hillsborough, New Brunswick, Canada

Works Destroyed by Fire — Now Rebuilding

DO YOU WANT A GOOD HOIST?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	**Mortar Conveying**	**Well Digging**
Bridge Building	**Sewer Building**	**Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists London, Canada

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President
Thos. C. Irving Jr., Vice-Pres.
Jas. W. [illegible], Secretary
Chas. Warnock, Treas. & Mgr.

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, Canadian Express Bldg., Montreal, Que.
Branch Offices, Traders Bank Building, Toronto, Ont.
Norfolk House, Laurence Pountney Hill, London, E.C.

Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's New Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

for concrete reinforcement is made from high carbon, cold drawn wire. The process of cold drawing eliminates the possibility of flaws. Perfection Wire Mesh is necessarily perfect.

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

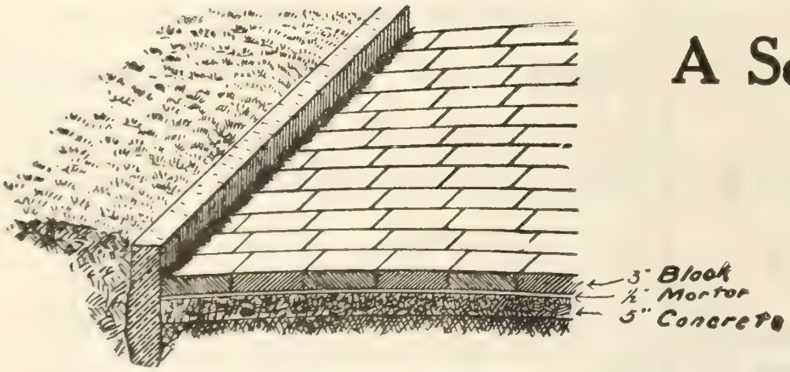
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

for Highest Efficiency, Absolute Reliability, Greatest Economy

Used by the Largest Mining Companies and Hydro-Electric Plants.
Also Extensively for Dredging, Exhaust Steam, Compressed Air, etc.

Sizes 3 to 42' Diameter up to ¼" in thickness
Easily installed and securely connected with our Forged Steel Flanges or All Steel Bolted Joints.

Write for our Catalogue [illegible] 4 and prices on your requirements

AMERICAN SPIRAL PIPE WORKS - MAIN OFFICE CHICAGO
NEW YORK OFFICE 50 Church Street

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.) "Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."

W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.
1032 Garfield Building, CLEVELAND, OHIO
SELLING AGENTS
The Dominion Equipment & Supply Co., Winnipeg, Canada

Strengthen your Concrete

by using

Guelph Hydrated Lime

The engineer who is dealing with concrete construction can greatly strengthen his job by using

Guelph Hydrated Lime

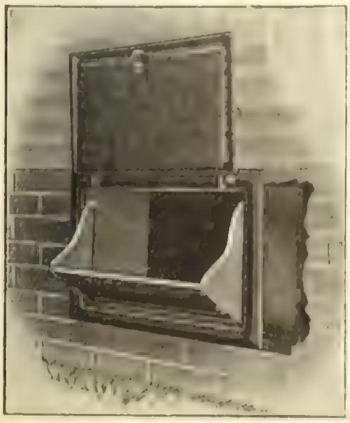
It makes the work Waterproof, and a better color.

Specify

Guelph Hydrated Lime

and insist on your dealer supplying it.

Standard White Lime Co.
Guelph - Ontario



EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

[illegible]

The Down Draft Furnace Co., Limited
Galt, Ontario, Can.

Fred Holmes, President C. P. Holmes, Sec'y-Treas.

Telephone North 663

Fred Holmes & Sons
Limited

Building Contractors

1113 Yonge St., Toronto

Terra-Cotta Fireproofing

Get an Estimate from
ROBERT BENNETT
Contractor
347½ Euclid Avenue, Toronto

☞ Over 25 years experience in U. S. and Canada

PHONE COLLEGE 4362

You should urge the use of Preston Steel Ceilings . . . .

Because. . . . . these ceilings are actually far cheaper than plaster, in the long run, as they never need repairs and will outlast the building it self. Thus they are the most permanent ceiling money can buy.

Because. . . . . Preston Steel Ceilings are fireproof; damproof; sanitary—can be washed as readily as a window-pane. They lower the insurance rate and increase the health rate. They are the modern ceilings—plaster is a mere makeshift.

Because. . . . . Preston Steel Ceilings can be decorated charmingly by any painter, as soon as they are in place. And they have a score more merits of utility and economy that we would like to point out to you, and through you to your customers. Ask for pattern book and price lists. Address

The Metal Shingle & Siding Co.
Limited
Preston, Ontario
Branch Office and Factory - MONTREAL

Over 1,100 DESIGNS

Ask for the book

The Carey Roof Standard
CAREY'S FLEXIBLE CEMENT ROOFING

TO PROVE TO YOU the high, standardized construction and composition of Carey's Roofing, we want to send you BOOKLET AND SAMPLE FREE, and give you practical information regarding Carey's Roofing based on 25 years' actual time-proved tests Carey's Roofing is equally adapted to flat or steep surfaces, wood sheathing, tile or concrete. Whether your contract is large or small, we want to show you the advantage of using a standardized roofing material. THE PHILIP CAREY MFG. CO., 60 Wayne Ave. Cincinnati, O. 50 Branches.

"FAMOUS FOR DURABILITY"

TENDERS

For Roofing and Sheet Metal Work
in all parts of Canada
Communicate with

A. Schwoerer & Sons, Inc.
530-34 E. 80th St. New York, N.Y.

Now working in Winnipeg, Regina, Vancouver, Montreal and Ottawa

IRON STAIRS

Dennis Wire & Iron Works Co.
London, Canada Limited

Toronto Offices - 12 QUEEN STREET E.

Cut shows a four wheel steam Locomotive Crane with 40ft. boom handling forms on New York Catskill Aqueduct at Valhalla, N.Y. These contractors are finding our cranes indispensable in this work, as they can be used for so many purposes; such as handling loose materials as broken stone, sand, concrete, etc., heavy timbers, rails, concrete forms, etc.

THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND, OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City

---

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

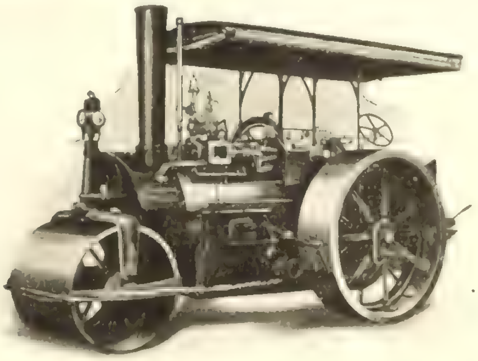
THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft are not required.

Sole Licensees and Manufacturers for Canada

Gardiner & Gaskill, 505 Power Bldg. Montreal, Que.

Telephone Main 159

"A Canadian Roller
for Canadian Roads"



THE WATEROUS
DOUBLE CYLINDER
STEAM ROLLER

is built essentially to suit Canadian road building conditions. Over 100 Rollers in use in Canada to-day are proving their ability as road makers of the highest quality. A greater rolling capacity, with less cost of maintenance and operation, are its distinguishing characteristics. [illegible]

The Waterous Engine Works Co.
BRANTFORD, CANADA Limited

Agent:—Hugh Cameron & Co., 72 Queen St. E., Toronto, Ont.

This Book Free to

Builders, Architects, Engineers

Every man interested in the designing or building of Re-inforced Concrete of any kind should have a copy of this latest Hand-Book of ours.

It tells briefly, and without a confusing mass of technicalities, of the latest wrinkles in Re-inforced Concrete Beams, Floors, Roofs, Bridges, Culverts, Retaining Walls and Dams.

It also describes with profuse illustrations the construction of Fire-proof Partitions, Ceiling and Exterior Walls with re-inforced cementine or stucco.

If your copy sent to those on our mailing list, has not yet reached you, drop us a card for another.

Don't fail to consult us about any of
your Re-infroced Concrete problems

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE—FRASER AVENUE

MONTREAL
138 CRAIG STREET WEST

Halifax—Room 13 Keith Bldg.
St. John—13 Germain St.
Quebec—153 St. Paul St.
Ottawa—83 Banks St.

Fort William—113 N. May St.
Winnipeg—334 Garry St.
Calgary—309-8th Avenue.
Vancouver—416 Pacific Bldg.

TENTS

for Engineers and Contractors

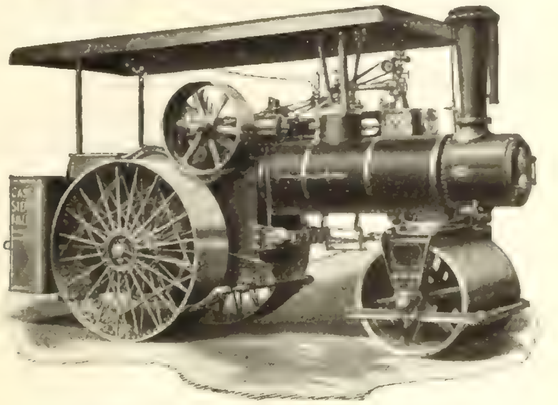
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

Woods Limited
Woods Building - Ottawa, Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT

THOROUGHLY REPAIRED **IMMEDIATE SHIPMENT**

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18" x 26" cylinder Mogul, Standard Gauge, and 18-10" x 14' Vulcan and Davenport dinkeys, 36" Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36" Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8" Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag-Scrapers an 1—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36" Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW
May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. and Dolland Lane - - MONTREAL, CANADA

Sand and Gravel

Lime
Cement
Plaster
Hair
Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones. Office North { 664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C. P. R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

RECIPROCITY

means to exchange. We have high quality fittings, you have good money. Lets get together.

S BRAND

Cast Iron Fittings and Valves are Right

"Everlasting" Blow-off Valve
SIMPLE — DURABLE — EFFICIENT

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

The

Missisquoi Marble Company
Limited

Canada's Pioneer and Leading Concern in the Marble Business

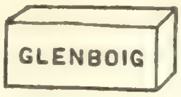
They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices :—

Eadie-Douglas, Ltd. - -	Toronto, Ont.
C. N. Barclay - -	Winnipeg Man.
Bosse & Banks - -	Quebec, Que.
General Contractors Supply Company, Ltd. -	Halifax, N. S.
129 Sparks Street - -	Ottawa, Ont.
James Robertson Co. Ltd. -	St. John, N. B.
G. R. Duncan - -	Fort William, Ont.
Walker & Barnes - -	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd. -	Vancouver, B. C.
315 Coristine Building -	Montreal, Que.

Do You Handle Fire-Brick?

The undisputed supremacy of GLENBOIG FIRE-BRICKS make them the easiest to sell. There is a big demand for them.



Every Glenboig Brick bears the brand

"Glenboig Bricks" have stood the test of extreme heat without cracking; quick changes of temperature and without expanding or contracting.

Get our Literature

SELLING ACENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

Pine Doors

The kind that don't sag and warp

We have equipped our factory with the latest door making Machinery and are able to turn out doors not only of the best quality but at the right price.

Prompt Deliveries **Write for prices**

L. A. Delaplante Limited

Head Office (Manning Arcade)
24 King St. W. Phone Main 591 TORONTO
Planing Mills, East Toronto - Phone Beach, 230

Builders' Supplies

Mouldings
Turnings
"Empire Brand"
Hardwood Flooring
Stair Building
Interior Trim
Sash
Veneered Doors
Pine Doors

J. R. Eaton & Sons
Limited
Orillia, Ontario

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos
263 Armstrong Ave., Jersey City, N. J., U. S. A.

Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

SCANDINAVIA
FEDERAL ENGINEERING & SUPPLIES LIMITED
TORONTO
BELTING

This belt is not made in plies, but is solid woven and is impregnated to resist moisture.

Write us your requirements and we will sell you a belt guaranteed for your use.

Federal Engineering & Supplies, Limited

Head Office:
284 Yonge Street, Toronto.

Branch:
329 St. James Street, Montreal

THE
Thames Quarry Co.
St. Mary's, Ont.

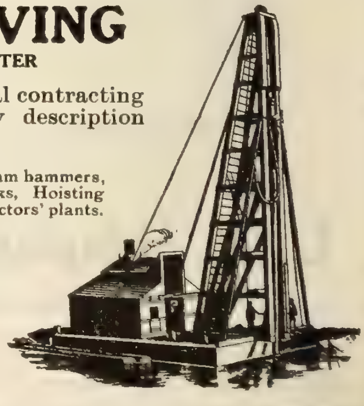
CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.



Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered at Toronto:—

	Per M.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES

(Installed in Toronto).

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile--Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite, 55 cents per square foot.

Viterous Tile--All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile -3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 1 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.[illegible]; 18 x 36, $1.[illegible]

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

Brown sills and heads, in the rough, delivered, 40 cents per foot.

Rubble stone in car lots, $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds. delivered f.o.b. Toronto.

Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime $9.00 in car lots.

Lime, per cwt., delivered, 38 cents.

Plaster of Paris, per barrel, deilvered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

PAINTS AND OILS

(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

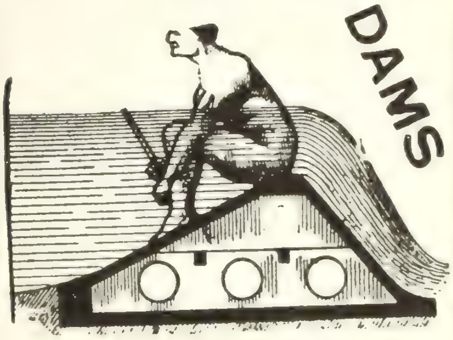
Turpentine, in barrels, See per gallon.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs

AUTOMATIC SASH HOLDER
saves cord, weights, pulleys, and materials--no pockets—easier to install for old and new windows. Send for sample and catalgue to-day. Agents wanted. Sold by the hardware trade or direct from 277 Broadway, New York
Automatic Sash Holder Company

Bonds of Suretyship for Officers and Employees in positions of trust
Bonds Bid and Supply in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies
The
Guarantee Company of North America
The Pioneer Company   Established 18[illegible]
Head Office - Montreal
Capital and Resources over $1,965,000
Claims Paid over $2,265,000
No Claims in Dispute
This Company is not a party to any premium tariff combination

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.   Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

DOMINION BRIDGE CO.

LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co. Limited

Darlington, England

Bridges and Steel Structures

Canadian Offices:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

——Bridge and Construction Dep't.——

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS SUPPLIES

WATER WASHED SAND

OUR SPECIALTY

Dealers in
Sand and Gravel
Crushed Granite
Crushed Stone

SAND
&
SUPPLIES, LTD.
TORONTO

The
Phœnix Bridge & Iron Works Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

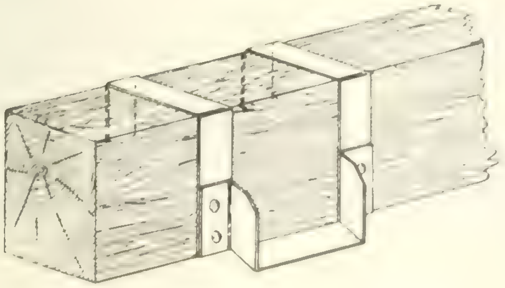
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

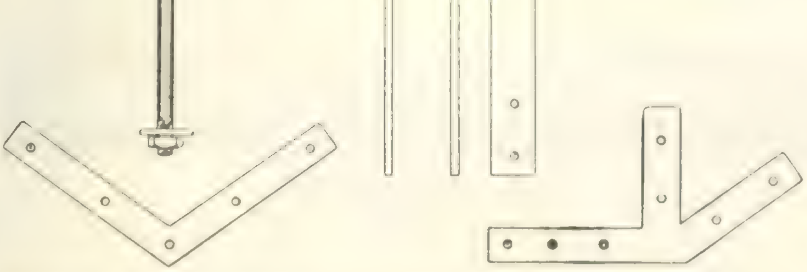
Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company, Ltd.

HAMILTON, ONT.



STEEL JOIST HANGERS, Single or Double



IRON FORGINGS, for Wooden Trusses, Apex Straps, Stirrups, Bolts and Rods made to order

Beams,

Angles,

Channels,

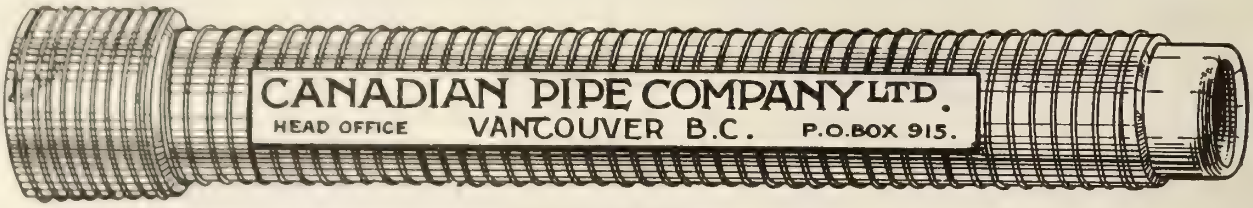
Plates,

Any Size from 1½ inch to 24 inches, and any length up to 70 feet.

CAST IRON COLUMNS
all sizes and designs

S. S. SELMAN, President

A. G. McGREGOR, Gen. Manager


CANADIAN PIPE COMPANY LTD.
HEAD OFFICE
VANCOUVER B.C.
P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners
Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

JAMES THOMSON, President. J. G. ALLAN Vice-President. JAMES A. THOMSON, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

PROMPT DELIVERIES

Fellowes and Fellowes

59 Yonge Street., TORONTO

Engineers' and Contractors' Machinery

Steel Dump Cars, Hoisting Engines, Derricks Pumps, new and second hand Rails and Cars, Turntables, Clam Shell and Orange Peel Buckets, etc. Contractors' Elevating and Conveying Machinery.

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments **Works and Offices: Ashbridge's Bay, TORONTO**

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS

CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street East, MONTREAL

John. T. Farmer

MECHANICAL AND HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.

A.M. Can. Soc. C.E. A.M. Am. Soc. C.E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C.E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 413, Pacific Block, **Vancouver, B. C.**

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { **Waterworks, Sewerage and Electric Lighting.**

Toronto and Winnipeg
John Galt John Haddin

Allan Keefer

Architect

Ottawa, Ontario

Arthur L. Weeks

Architect

Canada Life Building, Ottawa

Reinforced concrete and steel structures, factories and commercial buildings

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes. "Roman" building stone. "Milton" pressed bricks. Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. **Montreal**

Bell Tel. M. 4354

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

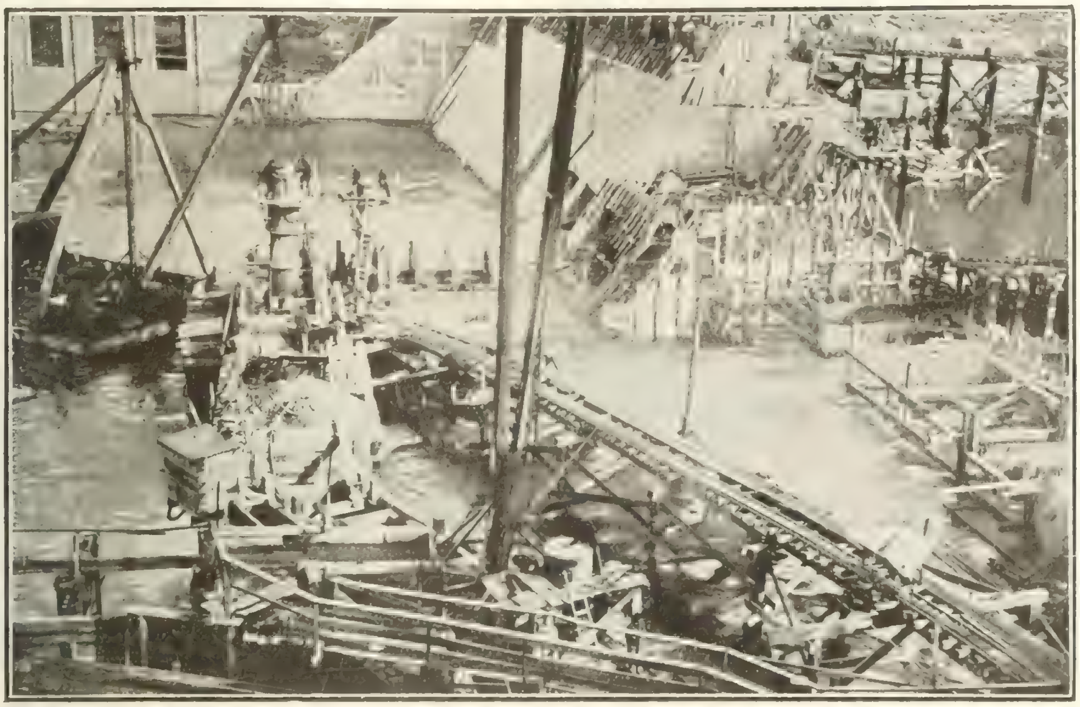
JOHN J. GARTSHORE

58 Front Street W., TORONTO

THE FOUNDATION COMPANY

LIMITED

Bank of Ottawa Building - Montreal, Canada



A Massive Concrete Dam

MADE POSSIBLE BY A

PNEUMATIC CAISSON COFFERDAM

This **ELIMINATED DESTRUCTION** of Cofferdam by high water **INSURED CONTINUOUS WORK** in the river at any stage of water, **PERMITTED PROMPT STARTING** of permanent work without long delay of constructing Cofferdam, **RESULTING IN GREAT SAVING** of time—a vital factor

OUR SCOPE:

BRIDGE PIERS — DOCKS — DAMS — SEA WALLS — MINING SHAFTS
WHARFS — TUNNELS — WATER POWER CONSTRUCTION
HEAVY BUILDING FOUNDATIONS

We Invite Inquiries in Reference to Cost and Design of Difficult Foundation Work.

Barrett Specification Roofs

Main Works of
American Optical Company, Southbridge, Mass.

No Maintenance Expense

THE most economical way to roof a building is to put on a ***good*** slag or gravel roof. The way to really get a roof of this character is to ***insist*** that your roofer lay same strictly "according to The Barrett Specification," ***using the materials specified.***

This specification is the standard method for using coal tar pitch, tarred felt and slag or gravel to make a roof which will give ***maximum*** service.

It completely removes all ***uncertainties.***

The owner has a definite, practical specification on which he can invite competitive bidding with absolute certainty of getting uniform quality, workmanship and results, provided a reputable contractor is employed.

A Barrett Specification Roof is inexpensive. Such roofs give upwards of 20 years of service. They need no painting or other maintenance expense.

The net result of low first cost and no maintenance is a ***low unit cost*** per square foot per year of service which is below that of any other roof covering known.

A copy of The Barrett Specification sent free on request.

The Paterson Manufacturing Co., Limited

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

Ritchie Contracting & Supply Co.,

Limited

7th Floor Bower Building, 543 Granville Street,
VANCOUVER, B.C.

Manufacturers and Dealers in Building Materials and Contractors' Supplies

We carry in stock **Ransome Concrete Mixers** and parts.

AGENTS FOR :—**Hart-Ottis Convertable Cars**
Davenport Locomotives
McCully Rock Crushers
Marion Steam Shovels
The Dominion Wire Rope

Write, phone, or call for prices and catalogues.

Our aim, prompt delivery.

Abrico Road Drag No. 1

It Cures Sick Roads

Patented April 28, 1908

Length 8 feet. Width between blades 30 inches. Blades 6 inches. Weight 300 pounds.

Do you want nice smooth roads?

This Drag will take out all of the **bumps** and fill up all the **ruts.**

It is of steel construction and is adjustable, both forward and backward, and can be operated by one man and team.

Do not let distance keep you from having one.

Your order by mail will be given careful attention.

Manufactured by

Attica Bridge Company

Attica, Indiana, U.S.A.

Canadian Representatives desired. Write for special terms.

Wheel Barrows

For Every Purpose

We carry a complete stock of "Kilbourne & Jacobs" Barrows, suitable for every requirement. These barrows will out-wear any other make and once you install "K and J" Barrows on your work you will use no other make. They cost no more and when you purchase barrows—you might just as well get the very best. We have a special Barrow Catalogue, which illustrates and describes fully every imaginable style of wheelbarrow—we want you to have a copy—it will surely come in useful—perhaps not now at the monent—but some day.

If you need barrows for your present work—tell us your requirements—we may be able to suggest a type of barrow which will be just what you always wished for. We have so many different styles—Barrows for

Concrete Stone Sand Earth Ashes
Mortar Brick Sawdust Coal
Coke Metals, Etc., Etc.

Drop Us a Line for Copy of Catalogue 30

F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.

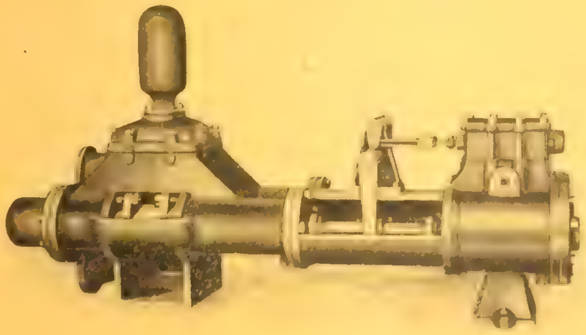
Vol. 25 Toronto, June 21, 1911 No. 25

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

We Manufacture
Steam and Power Pumps, Condensers,
Travelling Cranes, etc.



Write for Catalogue

The **Smart-Turner Machine Company**
HAMILTON, ONTARIO Limited

"MADE IN CANADA"

Bent Glass

Made in all
Kinds of
Glass
on Short
Notice

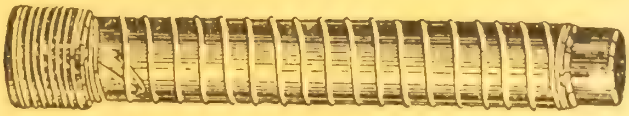
Large Bent Plate Glass for Shop
Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: Don Speedway
Bending Works: 209-213 Victoria Street, TORONTO

The House for
Sheet Copper

Try us on your next Specification

A. C. Leslie & Co., Limited
Montreal



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS
for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

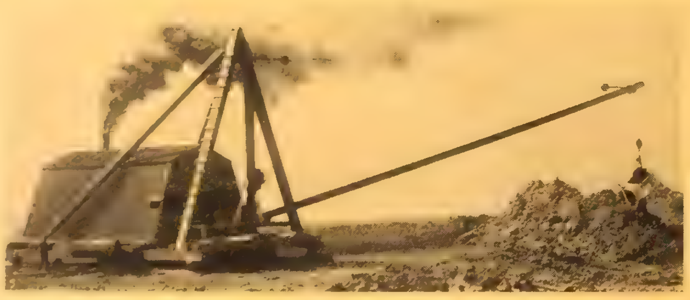
General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

---

The "AMERICAN" Scraper Dredge



Installed at Centerville Lake, Minn., handled material at a cost of less than

6 cents per Cubic Yard

From report of Commissioner of Public Works, St. Paul, Minn.

"AMERICAN" Dredges

Earn Immense Profits

Write us for Suggestions and Information

American Hoist & Derrick Company

St. Paul, Minn., U. S. A.

Gorman, Clancey & Grindley Edmonton and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot, Ltd. Vancouver, B.C.
J. L. Neilson & Co. Winnipeg, Man.
Dunn Brothers Winnipeg, Man.
J. A. McTaggert Winnipeg, Man.

Please send prices and information on "AMERICAN" Equipment. State whether Engines, Derricks, etc.

AMERICAN HOIST & DERRICK CO. St. Paul, Minn.

C. R.

Name

Address

When making specifications keep these facts in mind about Canada Cement

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

Remember

We guarantee **uniformity of strength, setting qualities, color,** and **fineness of grinding,** which must obtain if Concrete construction is to prove successful.

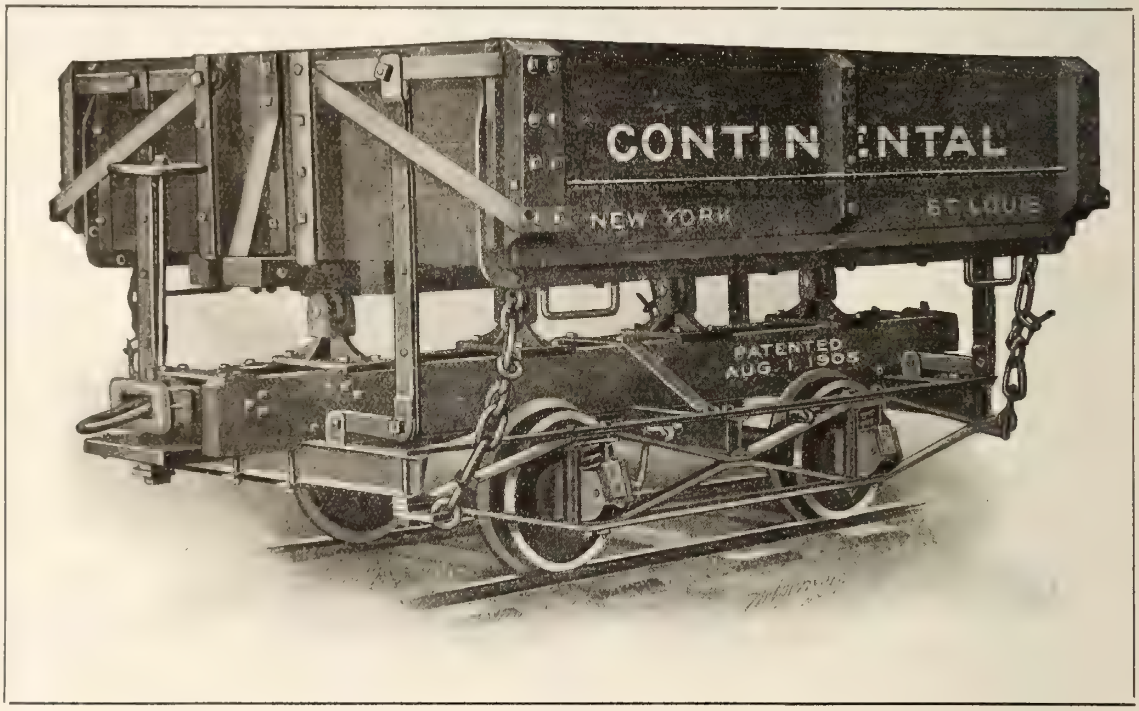
CANADA CEMENT COMPANY LIMITED
PORTLAND
CANADA
CEMENT
MONTREAL

Canada Cement Company, Ltd.

MONTREAL - TORONTO - WINNIPEG - CALGARY

Two Way

DUMP CARS



1½ Yd. 2 Yd. 3 Yd. 4 Yd. 5 Yd. 6 Yd

Wood Sills and Diamond Frames

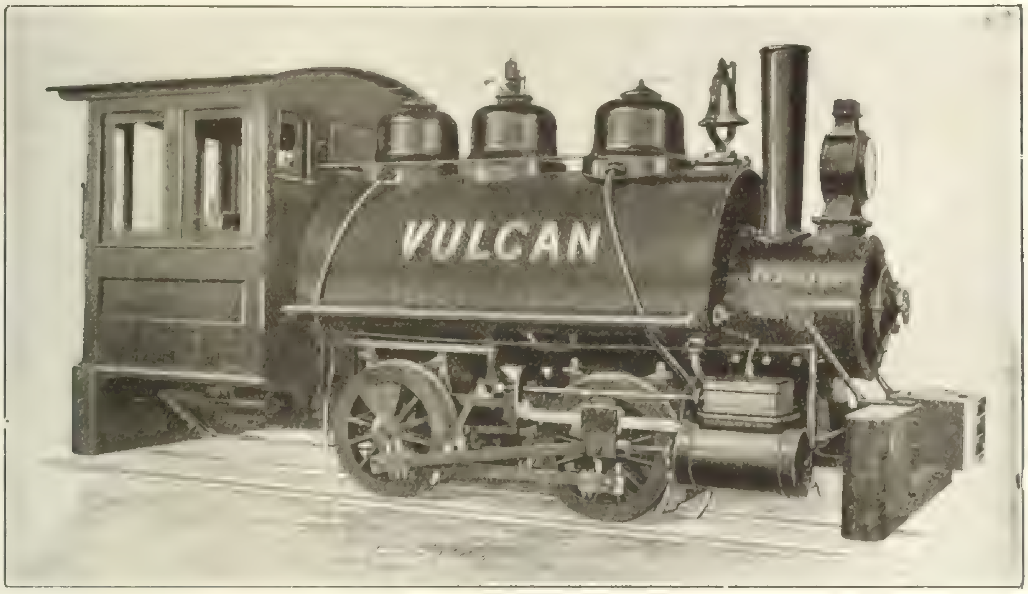
Also V Shaped Cars, Mine Cars, Scoops and Rotary

Car Irons to Build your own Cars

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

Saddle Tank
LOCOMOTIVES
"VULCAN MAKE"



or Contractors, Mines, Yards and Switching.
Mogul and Logging Locomotives

Vulcan Engines in use Everywhere

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects Page
Keeler, Allan 88
Weeks, Arthur I 88

Architectural Iron Work
Canada Wire Goods Mfg. Co 73
Dennis Wire & Iron Works 77
Meadows Co., Geo. B 33

Air Compressors
Escher Wyss & Co 67

Air Valves, Automatic
Marsh, J. P 80

Asphalt Plant
East Iron Machine Co. 73

Buckets
American Hoist & Derrick Co. 2
Sackett Screen & Shute Co 76

Belting
Federal Engineering & Supplies, Ltd 72

Blowers
Sturtevant Co., B. F. 29

Boilers
Case Threshing Machine Co 79
Inglis, John 65
Jenckes Machine Co. 2
Leonard & Sons, E 73
Marsh & Henthorn 68
McDougall Caledonian Iron Works 67
Mussens Limited 4
Waterous Engine Works Co. 77

Brick Machinery and Supplies
Berg Mfg. Co. 14
Peerless Brick Machine Co
Wert C. S. 27
Whitehead, John 25

Brick
American Enamelled Brick Co.
Don Valley Brick Works 7
Hamilton Pressed Brick Co
Milton Pressed Brick Co 72
Port Credit Pressed Brick Co 86
Toronto Pressed Brick Co. 71

Brickmaker's Supplies
Sackett Screen & Shute Co 76

Bridges (Steel)
Attica Bridge Co. 91
Canadian Bridge Co 84
Cleveland Bridge Co. 84
Dickson Bridge Works
Dominion Bridge Co 84
Hunter Bridge and Boiler Works 30
Phoenix Bridge and Iron Works 85
Pennsylvania Steel Co. 84

Cement
Alsen Portland Cement Co 74
Britnell & Co 80
Bremner, Alex 87
Canada Cement Co 3
McNally & Co., W. 85
Morrison & Co., T.A. 88
Rogers, Alfred Limited 9

Concrete Pipe
Dominion Concrete Co. 22
Lock Joint Pipe Co. 26

Cement Waterproofing
Ceresit Waterproofing Co. 33
Hercules Waterproofing Cement Co
Mansbendel, F. P. 31

Cranes, Travelling & Locomotive Page
American Hoist & Derrick Co. 2
Armstrong, H. J.
Brown Hoisting Machinery Co. 77
Males Co 62
Willis Shaw Machinery Co 62

Conduits
Conduits Co., Limited 87

Crushed Stone and Granite
Sand and Supplies 85

Concrete Mixers and Machinery
Canada Foundry Co 20
Cropp Concrete Machinery Co 82
General Machinery Co.
Gould, Shapley & Muir 16
Hopkins & Co., F., H 92
Jenckes Machine Co 2
London Concrete Machinery Co 35
Milwaukee Mixer Co. 16
Mussens Limited 4
Morrison & Co., T.A. 88
Steel and Radiation (Cement Gun) 78
Standard Scale 28
Vining Bros 76
Wettlaufer Bros. 10

Contractors' Plant
American Hoist & Derrick Co. 2
Acme Eqpt. & Engineering Co. 75
Beatty & Sons, M. 6
Hepburn, John T. 12
H. & E. Lifting Jack Co
Hopkins & Co., F.H 92
International Marine Signal Co 8
Willis Shaw Machinery Co 62
Meaford Wheelbarrow Co. 72
Marsh & Henthorn 68
Montreal Locomotive Works 32
Mussens Limited 4
Ritchie Contractors Supply Co.
Tiffin Wagon Co. 76
Troy Wagon Works 70

Crushers (Stone and Rock)
Berg Machinery Co
Case Threshing Machine Co. 79
Hopkins & Co., F. H. 92
Jenckes Machine Co 2
London Concrete Machinery Co 33
Males Co 62
Mussens Limited 4
Morrison & Co., T. A 88
Willis Shaw Machinery Co 62

Corrugated Iron
Galt Art Metal Co 30
Metallic Roofing Co 69
Metal Shingle and Siding Co
Ormsby, A. B., Limited 11
Roofers Supply Co 87

Contractors
Bennett, Robt.
Foundation Co
Holmes, Fred.
McIlwraith, Jas. A 88
Nadel & Adler 88
Wells & Gray

Coal Handling Apparatus
American Hoist & Derrick Co 2
Down Draft Furnace Co. 75

Derricks and Derrick Fittings
American Hoist & Derrick Co. 2

Drills
Beatty & Sons M 6
Canadian Rand Co

Drilling Contractors Page
Harvey, J. 89

Dredges
Beatty & Sons, M 6
Males Co 62
Willis Shaw Machinery Co 62

Dry Kilns
Sturtevant Co., B. F. 29

Electrical Apparatus, Motors
Canada Ford Co. 34

Engines
Case Threshing Machine Co. 79
Canadian Boving Co. 25
Inglis, John 65
Jenckes Machine Co 2
Leonard & Sons, E 73
Mussens Limited 4
Sturtevant Co., B. F. 29
Waterous Engine Works Co. 77

Engineers (Civil) and Mechanical
Barber & Young 88
Chipman & Power 88
Bowman & Connor 88
Farmer, John T. 88
Fuce, Edw. O. 88
Galt Engineering Co., John 88
Glaubitz, H. J 88
Hancock, H. Syd. 88
Inglis, John 65
Kennedy, Jas. C. 88
Lea & Ferguson 88
Mace, T. Harry 88
Mitchell, C. H. 88
McRae, John B. 88
Moore & Scollan 88
Taylor, James 88

Exhaust Heads
Sturtevant Co., B. F. 29

Filters
American Water Softener Co. 70

Floor Scrapers
Hurley Machine Co 30

Friction Clutches
Berg Machinery Co

Field Instruments
Gurley, W. & L. E. 68

Fire Brick
Gibb, Alexander 81

Fire Apparatus
Morrison & Co T. A 88
Seagrave, W E. 80

Fireproof Doors and Windows
Douglas Bros 18
Mussens Limited 4
Ormsby, A. B. 11
Steel and Radiation 78

Gauges, Steam, etc.
Marsh, Jas. P. 80

Granite and Marble
Laurentian Granite Co 83
Missisquoi Marble Co 81
Smith Marble & Construction Co. 73

Glass Page
Consolidated Plate Glass Co. 29
Luxfer Prism Co 91
Toronto Plate Glass Importing Co. 1

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. 73
Steel and Radiation

Hoisting Machinery
American Hoist & Derrick Co. 2
Beatty & Sons, M. 6
Canada Ford Co. 34
Inglis, John 65
Jenckes Machine Co 2
Hopkins & Co., F. H 92
London Gas Power Co 73
Marsh & Henthorn 68
Mussens Limited 4
Sturtevant Co., B F. 29

High Pressure Pipe Lines
Escher Wyss & Co 67

Hydrants
Canada Iron Corporation 87
Gartshore-Thomson Pipe Co. 86
Kerr Engine Co 14

Interior Finish and Doors
Anglin, S. 74
Brennen & Sons, M 29
Batts Limited
Canada Office & School Furniture Co
DeLaplante, Ltd. 81
Bryan Mfg. Co. 67
Eaton & Sons, J. R. 81
Georgian Bay Shook Mills
Rhodes Curry & Co. 71
Tillson Co. 19
Wilson Bros. 83

Locomotives
Montreal Locomotive Works 32

Lime
Christie, Henderson & Co. 80
Jamieson Lime Co
Standard White Lime Co 75

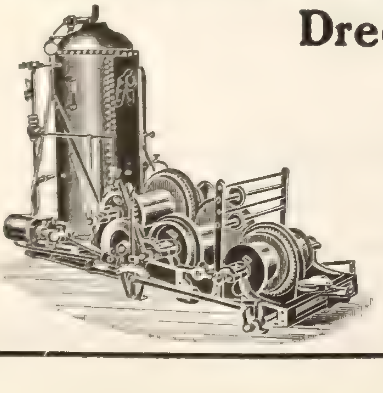
Metal Lath
Galt Art Metal
Metallic Roofing Co. 69
Noble C. W. 74
Steel and Radiation 78

Meters
Hopkins & Co., F. H. 92
McDougall Caledonian Iron Works 67
Neptune Meter Co 71

Paving and Paving Materials
Dominion Carbolineum Works 17
Metropolitan Paving Brick Co. 70
Ontario Asphalt Block Co. 74
Shawmut Paving Brick Co.
Silica Barytic Stone Co. of Ontario 83

(Continued on page 10)

M. Beatty & Sons, Limited Welland, Ontario, Canada



Dredges - Ditchers - Derricks

Steam Shovels

Steel Dump and Deck Scows

Submarine Rock Drilling Machinery

Mine Hoists, Hoisting Engines

Centrifugal Pumps, Clam Buckets

Steel Skips, Coal and Concrete Tubs

and other Contractors' Machinery

Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

SIMPLE PERFECT

CLEAN WATER

For MANUFACTURERS or MUNICIPALITIES

Can be obtained by using the

"TORRENT" or "PULSOMETER"

FILTER

Complete information furnished on request

International Marine Signal Company Limited
OTTAWA, CANADA

GRAVITY PRESSURE

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Page
Albert Mfg. Co	73
Britnell & Co	80
Calkins, H W	80

Pipe

American Spiral Pipe Works	75
Canadian Pipe Co	80
Dominion Wood Pipe Co	12
Dominion Concrete Co	22
Gartshore-Thomson Pipe Co.	86
Lock Joint Pipe Co	26
Munderloh & Co	11
National Iron Works	87
Pacific Coast Pipe Co	1
Pedlar People	
Steel and Radiation	78

Plumbers' Supplies

Standard Ideal Co.	34

Power Engines

Inglis Co., John	65

Paints and Varnishes

Paterson Mfg. Co.	90

Pile Driving Machinery

American Hoist & Derrick Co.	2
Lincoln Construction Co.	82

Pumps and Pumping Machinery

American Well Works	23
Beatty & Sons, M.	6
Cook, A. D	70
Escher Wyss & Co.	
Hopkins & Co., F. H.	92
Inglis Co., John	65
Leonard & Sons, E	73
McDougall Caledonian Iron Works	67
Mussens Limited	4
Ontario Wind Engine & Pump Co.	82
Smart-Turner Machine Co.	1
Waterous Engine Works Co	77

Roofing Contractors

Schwoerer & Sons, A.	

Roofing Materials

	Page
Asbestos Mfg. Co.	24
Galt Art Metal Co.	30
Metallic Roofing Co.	69
Metal Shingle & Siding Co.	
Noble, Clarence W	74
Paterson Mfg. Co.	90
Philip Carey Co.	
Roofers Supply Co.	87
Standard Paint Co.	

Railway Supplies

Gartshore, John J.	88
Hopkins & Co., F. H.	92
Mussens Limited	4

Reinforcements. Concrete and Steel

Ambursen Hydraulic Construct'n Co.	89
Canada Wire Goods Mfg. Co.	73
Concrete Form Engine Co.	69
Steel Co. of Canada	19
Steel & Radiation	78
Trussed Concrete Steel Co.	27
Turner, C. A. P.	83

Road Machinery

Case Threshing Machine Co.	79
Hamilton Machinery Co.	15
Morrison & Co., T. A	88
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co.	20
Hopkins & Co., F. H.	92
Mussens Limited.	4
Males Co.	62
Willis Shaw Machinery Co.	62

Stone

	Page
Anderson, Geo	18
Britnell & Co.	80
Brodie, Jas.	30
Christie, Henderson & Co.	80
Consolidated Stone Co.	
Contractors' Supply Co.	80
Corinthian Stone Co.	
Crushed Stone, Limited	73
Doolittle & Wilcox	68
Hagersville Contracting Co.	11
Laurentian Granite Co.	83
McMillan & Son, R.	
Morrison & Co., T. A.	88
Myers, Oakley	73
Roman Stone Co	13
Sackville Freestone Co.	8
Sand & Supplies	85
Thames Quarry Co.	82

Sand and Gravel

Rogers Supply Co.	31
Sand & Supplies	85

Steam Apparatus

Sturtevant Co., B. F.	29

Submarine Diver

Rouleau, Joseph N.	88

Structural Iron and Steel

Dominion Bridge Co.	84
Steel Co. of Canada	19
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	89
Salter, W. H.	85
Steel & Radiation	78

Sewer Pipe

Britnell & Co	80
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
GartshoreThomson Pipe Co.	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	26
National Iron Works	87
Ontario Sewer Pipe Co.	21
Standard Drain Pipe Co.	21

Stationary and Power Engines

Case Threshing Machine Co.	79

Slate

Roofers Supply Co.	87

Steel Shingles and Ceilings

Galt Art Metal Co.	30

Smoke Stacks

Leonard & Son, E.	73

Tents

Woods Limited	79

Safes and Vaults

Taylor, J & J	70

Testing and Inspection Bureau

	Page
Hunt & Co., Robt. W.	73

Tiles

Smith Marble & Construction Co.,	73

Tanks and Stand Pipes

Berg Machinery Co.	
Inglis, John	65
Jenckes Machine Co.	4
Leonard & Sons, E.	73
Marsh & Henthorn	68
McDougall Caledonian Iron Works	67
Ontario Wind Engine & Pump Co.	82

Trade Journals

Castellanos A. W.	82

Valves

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co	86
Kerr Engine Co.	14
Marsh & Co., Jas.	80
Standard Fitting & Valve Co.	80

Ventilating and Heating Apparatus

Gardiner & Gaskill	
Sturtevant Co., B. F.	29

Water Softeners and Filters

Berg Machinery Co.	
American Water Softener	70

Wire Rope

Greening Wire Co., B.	67
Smith, Thos. & Wm.	
Steel Co. of Canada	19

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	70
Crescent Wire Iron Works	89
Sackett Screen & Shute Co.	76
Steel and Radiation	78

Water Wheels

McDougall Caledonian Iron Works.	67
Canadian Boving Co.	25

Water Turbines

Escher Wyss & Co.	67

Wheelbarrows

Sackett Screen & Shute Co.	76

Improved Half-Yard Heart-Shaped Mixer

This Mixer is equipped with the improved dumping device which dumps the drum automatically or as required. The new improvement for discharging the drum effects a saving of one man, which means considerable on a contract. This mixer is especially built for roadwork of all kinds, sidewalk and construction, being substantially built and very compact.

Send for our Catalogue

Wettlaufer Bros.
178 Spadina Ave., TORONTO
A. R. Williams Machinery Company,
15 Dock St., St. John, N. B.
W. E. Ransome, Moose Jaw, Sask.

MUNDERLOH & Co Ld.
MONTREAL.

SEAMLESS STEEL TRACTION AND LIGHTING POLES.

MANNESMANN SEAMLESS STEEL PIPES. FOR GAS & WATER MAINS.

IN LENGTHS UP TO 40 FEET.

AN IMPROVEMENT ON CAST IRON.

ALL PIPES TESTED 75 ATMOSPHERES BEFORE LEAVING WORKS.

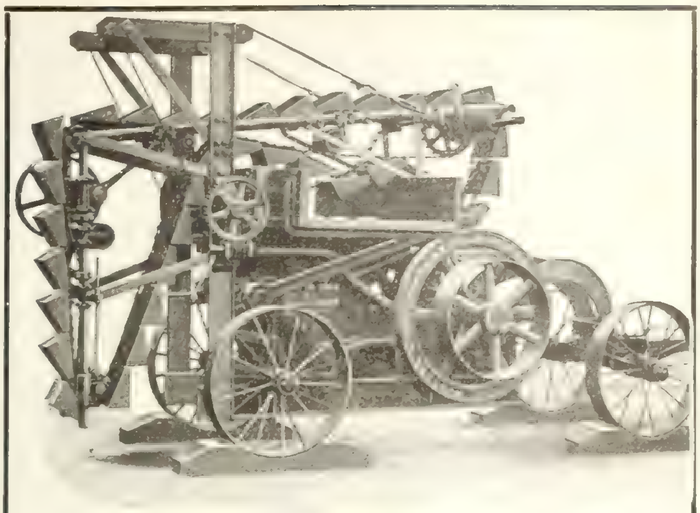
WRITE US FOR ILLUSTRATED BOOKLET

SEND US YOUR ENQUIRIES.

WE ARE SOLE AGENTS IN CANADA FOR—

MANNESMANN TUBES.

FOR ALL PURPOSES.



Steel Castings and No Lost Motion

forged steel yoke, cross bars on yoke remove all strains from main frame, moving jaw given a compound oscillating and reciprocating motion so that crushing is **continuous**, are features of the

Aurora Steel Rock Crusher

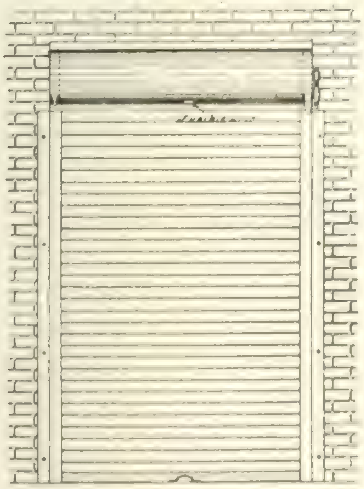
Its compact form combines great strength with light weight, making it very portable, and **specially adapted for contractors' use.** Strongest and most durable crusher on the market combining maximum product with minimum power. Adjustable to various sized stone. *Get our Special Crusher Catalo.*

Western Wheeled Scraper Co.

Earth and Stone Handling Machinery **Aurora, Ill.**

A Really Fireproof Rolling Steel Door

is our patented Rolling Steel Door. This was demonstrated in Geo. H. Hees Son & Co., Ltd., Fire in Toronto. They have our Rolling Steel Doors on their Freight Elevator Shaft. Their Fire started on the top flat. They say of it—"**The Rolling Steel Door** in the rear elevator shaft **withstood the flames** without bulging, warping or getting out of position and kept the flames from travelling down the elevator shaft." Specify our patented **Rolling Steel Door.** It has everything in its favor.



Experts in Fireproof Windows and Doors

A. B. Ormsby, Limited

Factories { Corner Queen & George Streets - TORONTO
677-81 Notre Dame Avenue W., WINNIPEG

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R.
and T. H. & B. Railways.

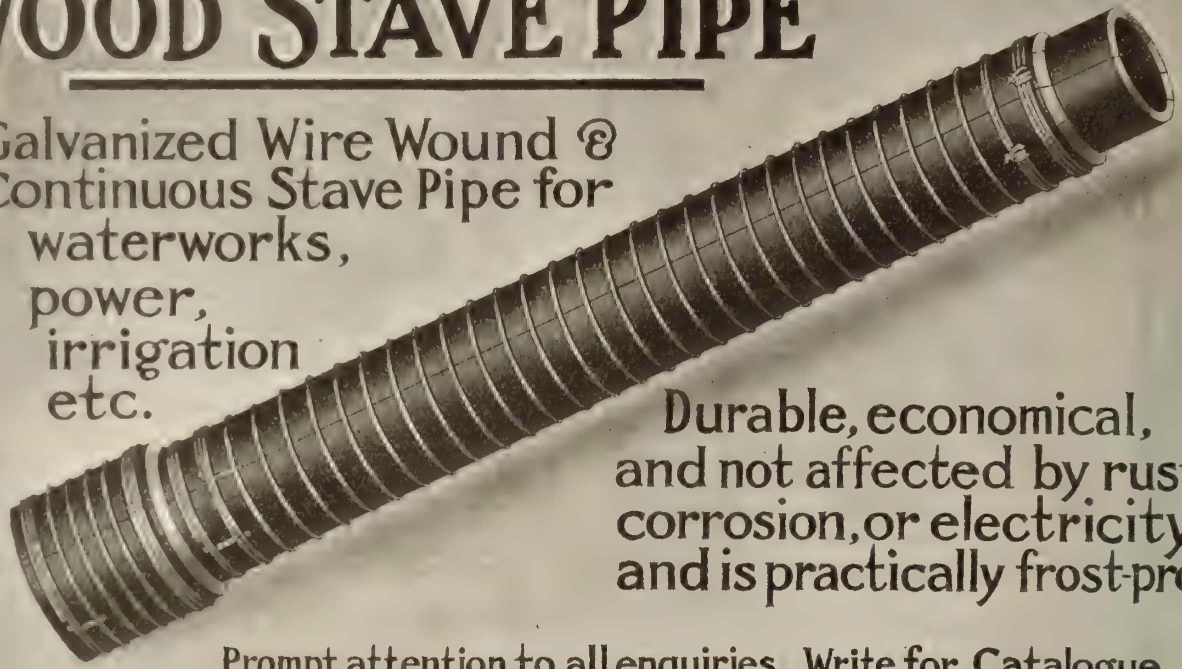
Hagersville Contracting Co.

Limited

Hagersville - Ont.

WOOD STAVE PIPE

Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.



Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Have you any use for a Derrick?

There are large plans under way. Large contracts are being placed. In all directions there is bustle and activity. Everything points to an unusually busy season for construction work of all kinds. But what about equipment?

John T. Hepburn

Scotch Derricks

are in use by all leading contractors in all parts of the country. They are designed and built for hard work, combining safety and high efficiency, with low operating cost. Being made in standard sizes, any part can be replaced at short notice. They may be operated by hand or power—are fitted with single and double purchase gears—powerful band brake—and safety locking device that prevents boom from falling.

We are busy now. We shall be busier in two or three weeks
Better place your order to-day to secure early delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company Limited

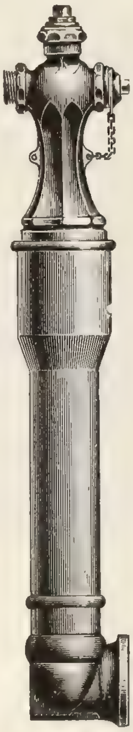
Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

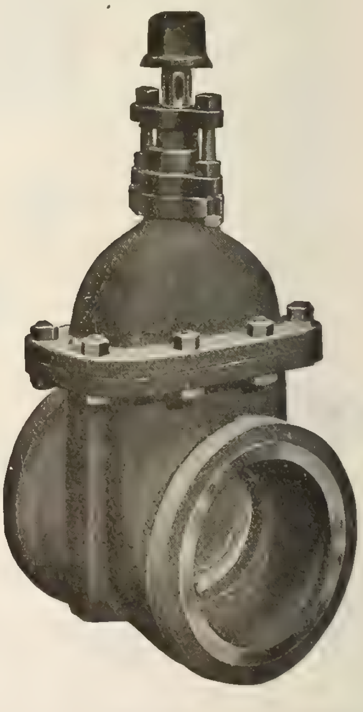
T. A. Morrison & Co.,
204 St. James St., Montreal

KERR Valves and Hydrants



are used by cities and towns in every part of the Dominion. They have a reputation built up by years of long and satisfactory service. YOUR municipality should specify "KERR" for all waterworks' contracts.

Unsurpassed in
Workmanship
Design
Material
Efficiency



THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

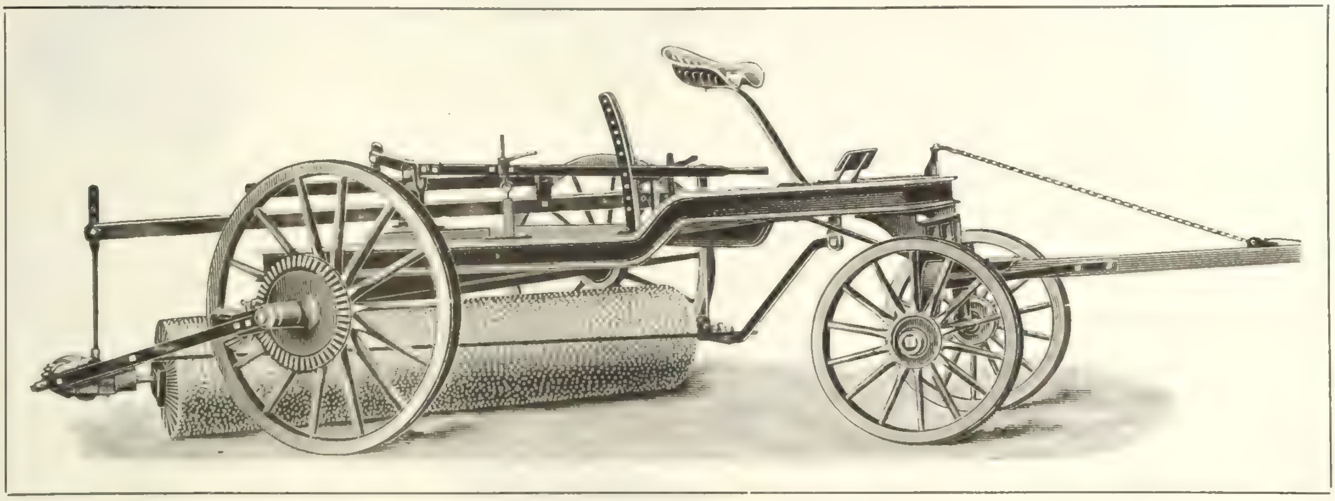
Two Big Leaders

"Keystone" Street Sweepers

and

"Champion" Street Sprinklers

THESE TWO SPECIALTIES are without a doubt two of the best examples of the quality maintained by the goods of this company. They are in no sense experiments, being in use from one end of Canada to the other with unfailing satisfaction to their owners.



We Claim for the "CHAMPION" SWEEPER

1. Perfect work on uneven road surfaces.
2. Light draft.
3. No contact between machinery parts and sweepings.
4. Steel fibre brush—thoroughly effective.
5. Power applied at heavy end of broom.
6. Adaptability to any class of roadway.

THE SPRINKLER This splendid sprinkler has every improvement of proven value. It is made in all sizes and styles to suit every requirement, but for ordinary use we recommend the horizontal steel tank with wood ends, platform spring or reach gear sprinkler, with steel frame and vertical spray sprinkling attachments. This style is made in four sizes, viz: 1000, 750, 600 and 500 gallon.

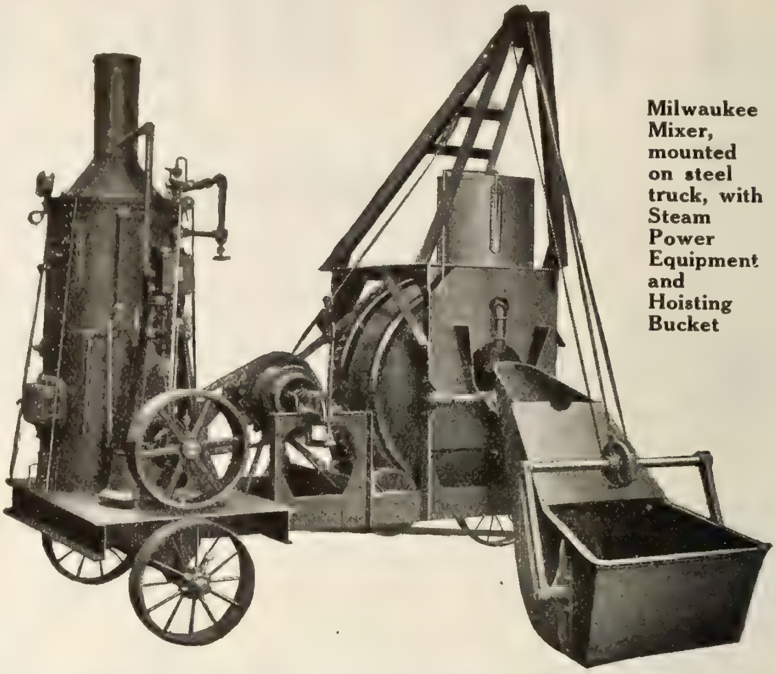
Send for Catalogue giving full description of these and the "Champion" Road Machinery.

The American Road Machine Company of Canada, Limited, Goderich, Ont.

The Hamilton Machinery Company, Ltd.
Hamilton, Ont.
Also Canadian Distributors for the famous "Interstate" Automobiles

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

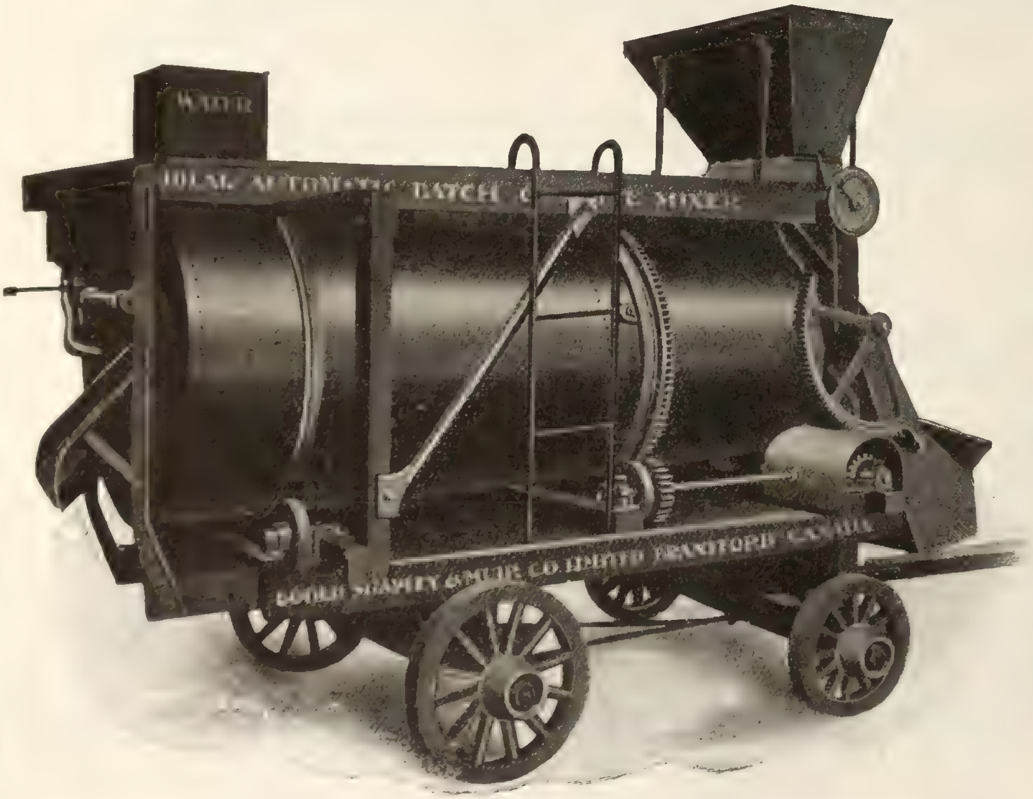
MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES.

The Stewart Machinery Co., Winnipeg, Man. C. W. Stancliffe & Co., Vancouver, B. C.
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS


WATER
IDEAL AUTOMATIC BATCH CONCRETE MIXER
GOOLD SHAPLEY & MUIR CO. LIMITED BRANTFORD CANADA

Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

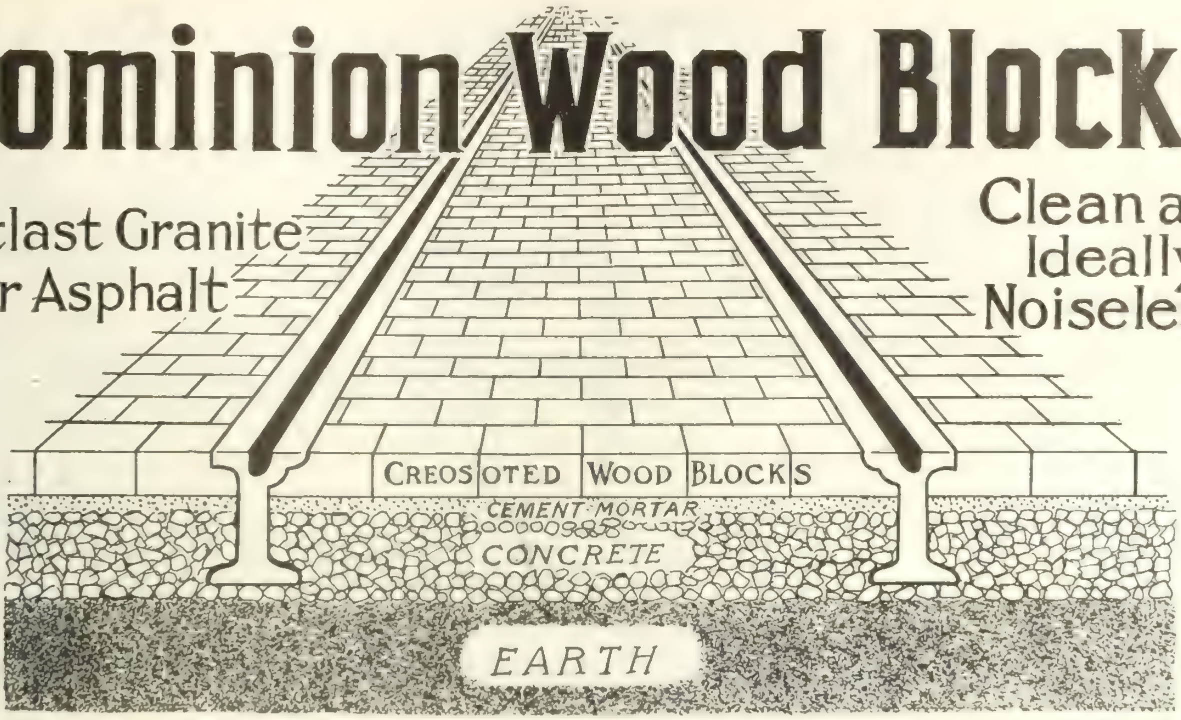
Write for Catalogues

The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada

Dominion Wood Blocks

Outlast Granite or Asphalt

Clean and Ideally Noiseless



Dominion Wood Blocks

make the most durable pavement for all classes of service, from the lighest wear of boulevard vehicles to the grinding of the heaviest trucking traffic. It is the one pavement that won't need the annual attention of the repair gang and will pass out of reserve in perfect condition.

Don't put your money in a pavement that will need patching before the final payment is made on the assessment.

The Dominion Creosoting Co., Ltd.

SUCCESSORS TO

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

Circular Diamond Saws

For Limestone, Marble and Sandstone

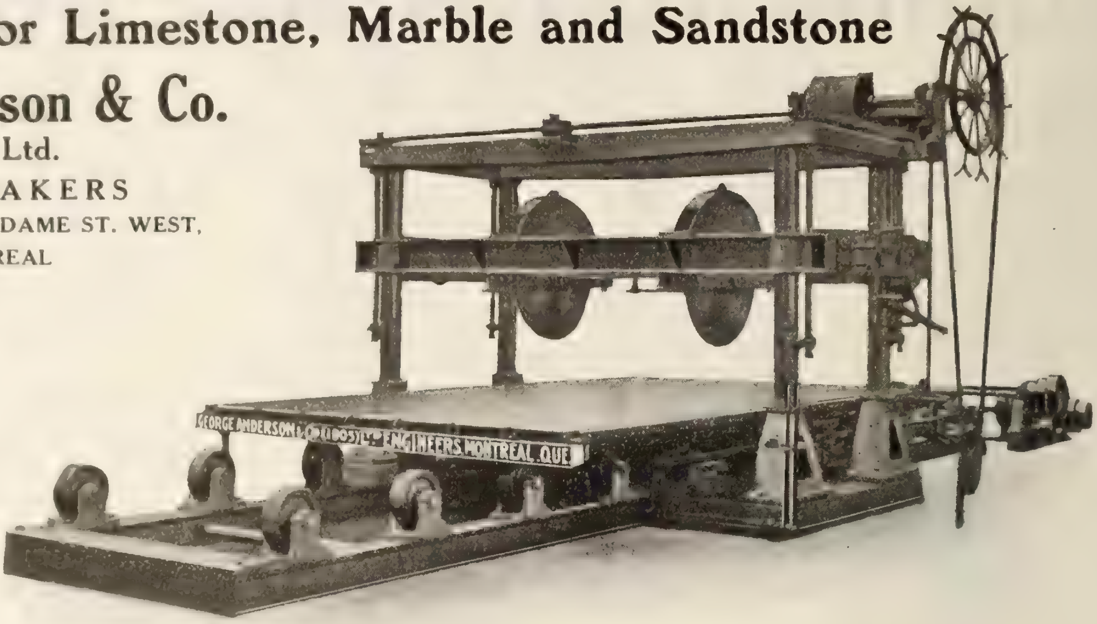
Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

Branch Offices & Works

London, England, 82 Victoria St. S. W., Newark N.J. U.S.A. 420-422 Ogden St., Montreal Works, 157 Craig St. West, Head Works, Carnoustie, Scotland

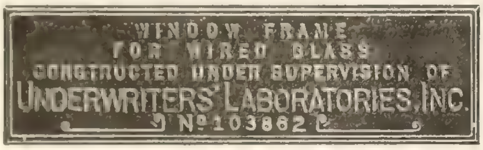
MAKERS OF

GANGS, PLANERS, MARBLE DRESSERS DERRICKS, AND ELECTRIC TRAVELING CRANES UP TO 50 TONS, QUARRY MACHINERY, GAS ENGINES AND PRODUCER PLANTS 10 H.P. TO 150 H.P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 **SINGLE AND DOUBLE TABLES**

About 50 of the above Machines at work in Canada


WINDOW FRAME
FOR WIRED GLASS
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES, INC.
No 103862

Underwriters' Label.

The Underwriter's Test

There is absolutely no question as to the comparative value of our Metal Fireproof Windows over the old-fashioned metal or metal-covered wood shutters. Repeated tests have proved conclusively the superiority of metal fireproof windows.

The ideal fireproof windows should be constructed to meet the following requirements:

It must be absolutely fireproof.

It must have hollow sheet metal frames and sash, fitted with wire glass.

It must be riveted and locked together so that it will not fall apart when exposed to intense heat, solder only being used to finish the seams and mitres.

The Douglas Window has stood the National Board of Fire Underwriters' test to which it has been subjected at their Laboratory at Chicago, and is endorsed by them.

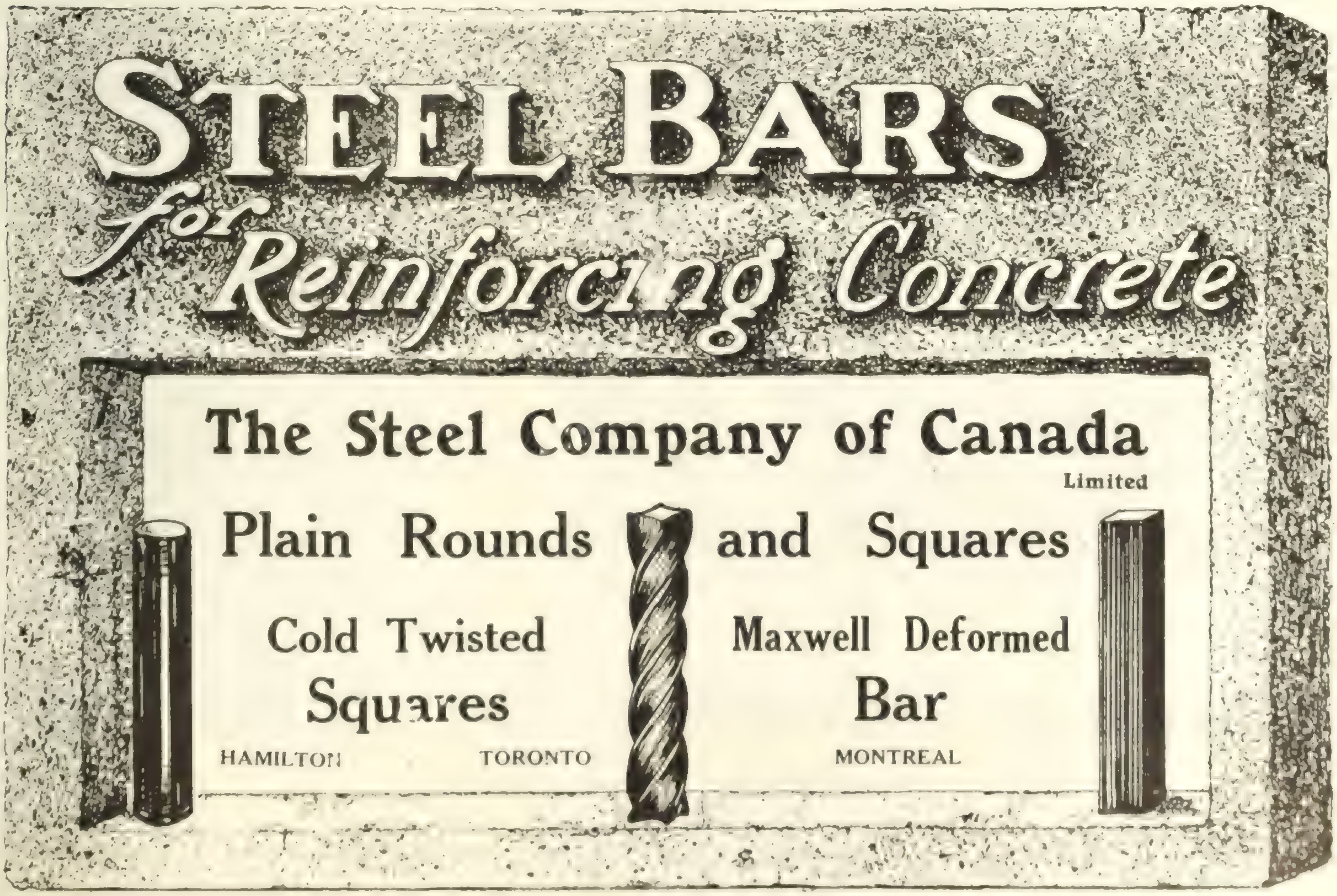
DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

The
Tillson Company
Limited
WHOLESALE MANUFACTURERS OF

Sash, Doors, Mouldings, Frames for Doors and Windows, Columns, Interior Finish of Every Description, Porch Work, Gable Ornaments, Brackets, Head Blocks, Corner Blocks, Base Blocks, Door and Window Screens, Etc.

Millwork of all kinds

Tillsonburg,
Ontario



STEEL BARS
for Reinforcing Concrete

The Steel Company of Canada
Limited

Plain Rounds and Squares

Cold Twisted
Squares

Maxwell Deformed
Bar

HAMILTON TORONTO MONTREAL

J. H. NEW, PRESIDENT RYLAND H. NEW, VICE-PRESIDENT

Don't be an Experimental Engineer

50 Years in Business

Don't be misled by the Local Cement Pipe Manufacturer. The man with a machine backed up to a sand and gravel pit, who don't know his business, and if perchance he did, who couldn't make sanitary sewer pipe out of cement. Then again there is the man who appeals to your council and yourself on the old cry "Patronize Home Industry." We suggest to you not to be an *"Experimental Engineer"*, that is of course if you have the interests of your work at heart. There is only one material for sewers and that is

**Vitrified Salt
Glazed Sewer Pipe**

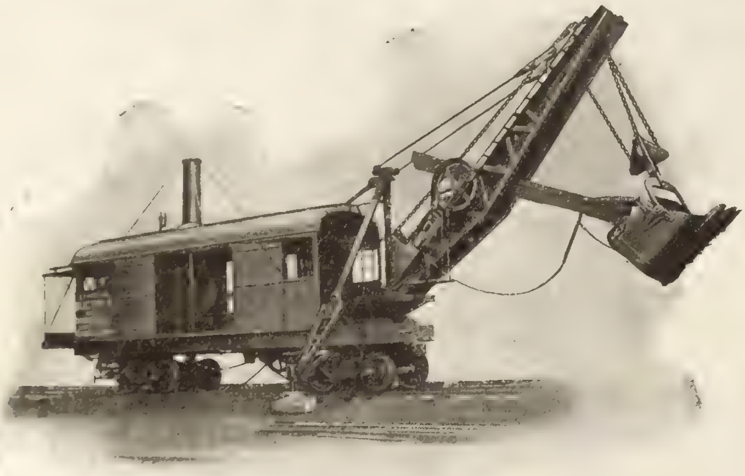
and Hamilton is the place to buy it.

The Hamilton & Toronto Sewer Pipe Co. Limited

HAMILTON and TORONTO

Long Distance Phones:—Toronto, Main 990, College 1558. Hamilton, 3990, 3991, 3432.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert Pipes

We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

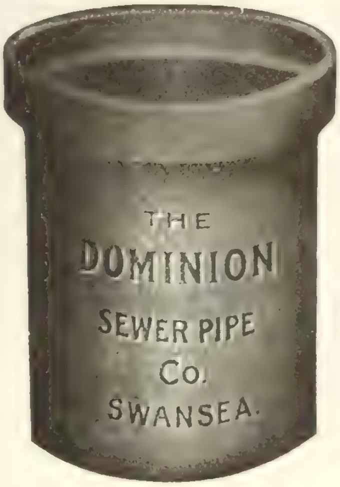
Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

Large Contracts are our Specialty

The Pipe that makes
THE SEWER SURE

ROUND Pipe and SQUARE Dealings

WE carry a stock in all sizes, 4 inch to 24 inch, large enough to keep any job going regardless of the press of business in one-car orders.

That means money to you

No waiting on pipe when you place your orders for **"MIMICO"** goods, and it is also 99$\frac{9}{10}$% right when it arrives.

It Saves You Worry
Worry Shortens Life

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422, Evenings Park 3888 and 3889

Railway Engineers and Contractors

Timber culverts rot, clay pipe culverts break from frost or weight, metallic culverts rust and are woefully dear, CONCRETE CULVERTS LAST FOREVER and the price is relatively low.

The only absolutely **durable and frost-proof** culvert pipe is

REINFORCED CONCRETE

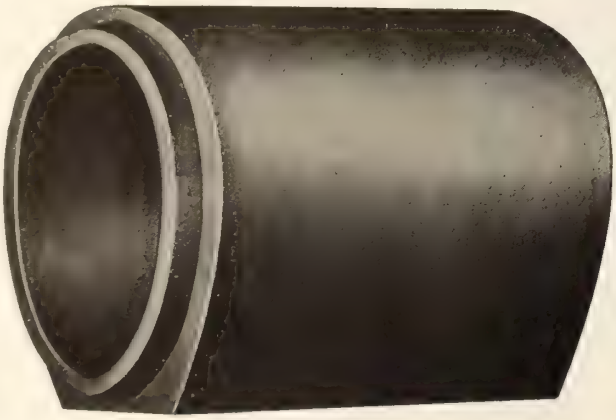
36" Section

of **first quality.** The prime requisites of first quality concrete are **good raw material, proper proportions** and **scientifically correct methods.**

We possess all these in the highest degree. Our years of experience, our facilities and our raw material enable us to make **good concrete** and make it **always good.**

Nowadays the railway engineer must get results in **permanency** as well as in other matters. The contractor too must get results if he is to stay in the game. A very important result to him is the **economy** of buying material that **holds out,** that can be handled with **facility,** and that can be procured **promptly** and at a **reasonable price.**

Don't imperil your interests by using non-durable material, or by trusting to the random hits and misses of a novice when you can buy **durable, mature,** and **guaranteed concrete pipe,** from a long-established and reputable firm.



30" Section

Mature Stock

Prompt Shipment

Quality Guaranteed

No Loss from Breakage

Low Prices

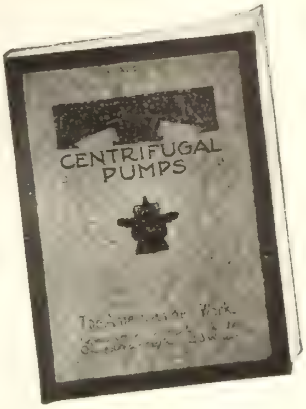
WRITE FOR CATALOGUE AND PRICES

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO

Why "American" Centrifugals

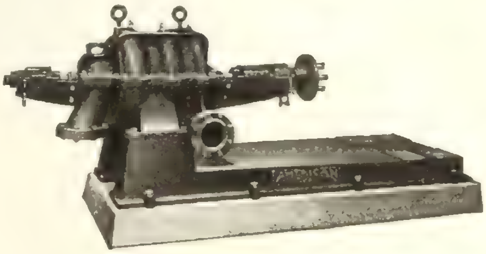
Are Most Economical in the Widest Range of Pumping Conditions.



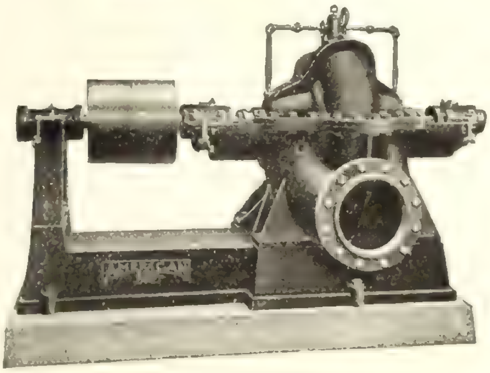
The reason why "American" Centrifugals are unequalled for economy is that they represent the highest development of the most modern type of pump and there are the best of reasons for this higher development.

Instead of building a single type of centrifugal and recommending it for every purpose "American" centrifugals are built in over fifty distinct types and every size of every type is carefully tested in our own complete hydraulical laboratory and its efficiency proved before it is permitted to leave our works.

It must meet our standard of efficiency before it is allowed to leave our works and that is what is making the American trademark famous in pumping machinery.

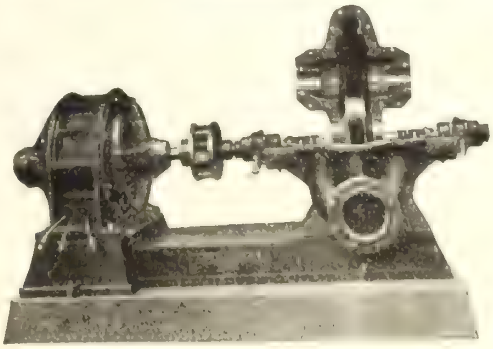


AMERICAN



"American" centrifugals attain up to 80 per cent. mechanical efficiencies and many of our specially designed pumps, installed according to our own specifications, show much higher efficiencies, enabling them to operate against high heads. We have many single stage centrifugals installed operating on over 200 feet heads.

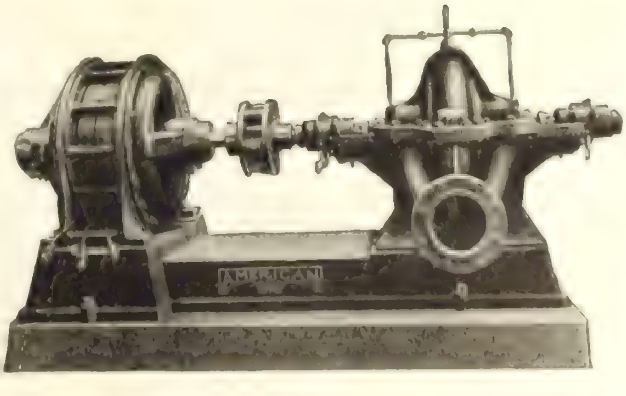
The low first cost of "American" centrifugals as compared with old style plunger pumps, combined with their high efficiencies, low cost for attendance and small cost for repairs make them **far more economical** than any other type of pump in nearly all conditions where **all costs are considered.**



Greatest economy in the end is the claim we make for "American" centrifugals and we are ready to prove that claim.

If you are interested in irrigation, write for our booklet, "Irrigation by Pumping" Bulletin No. 118.

Our General Centrifugal Pump Catalog No. 117 is the most complete ever issued. Write for it today.



The American Well Works

General Office and Works: Aurora, Ill., U. S. A.
Chicago Office: First National Bank Building

Canadian Sales Agency:
234 Craig Street West, Montreal.
441 Seymour Street Vancouver, B.C.

The Only Everlasting Roof

Asbestos Cement Slate

"This is practically indestructible by atmospheric influences, so that maintenance expenses for roofs covered with this material are excluded.

For a period of three months the asbestos cement slate absorbs, and assimilates moisture in exactly the same ratio as the best natural slate. After that time the absorption ceases altogether, and the material becomes impervious, indestructable, and as hard as iron.

The stringy asbestos fibres, which, by characteristic peculiarity of a patented process, are embedded cross-wise in the cement paste. This has exactly the same effect as concrete-steel constructions. They impart to the asbestos slate extremely high physical strength, indifference to blow or shock, and great elasticity. These properties are of the same importance to conveyance, and the laying of the asbestos slates, as they are to their durability and length of service.

The insulating capability of asbestos when brought to bear either upon heat or cold, imparts an increased importance to asbestos cement slate, not only in its suitability for the tropics—where it is commonly used as a substitute for corrugated iron ; but also for the continental climate, where it is economically used in workshops, in dwelling rooms, and particularly over garrets, which, with other roof coverings, would have to remain unoccupied.

The fireproof quality of asbestos renders asbestos cement slate a thoroughly fireproof material, which, owing to its strictly scientific manufacture, cannot become either cracked, rent, or scaled in case of fire."

The above is an extract, word for word, from a government report of the Canada Department of Mines.

We are the only manufacturers of asbestos shingles or slates in the Dominion of Canada."

Specify

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P.Q.
Factory at Lachine, P.Q.

John Whitehead & Co.
LIMITED
Albert Works: PRESTON, ENGLAND
Makers of

Reliable BRICK MACHINERY Efficient

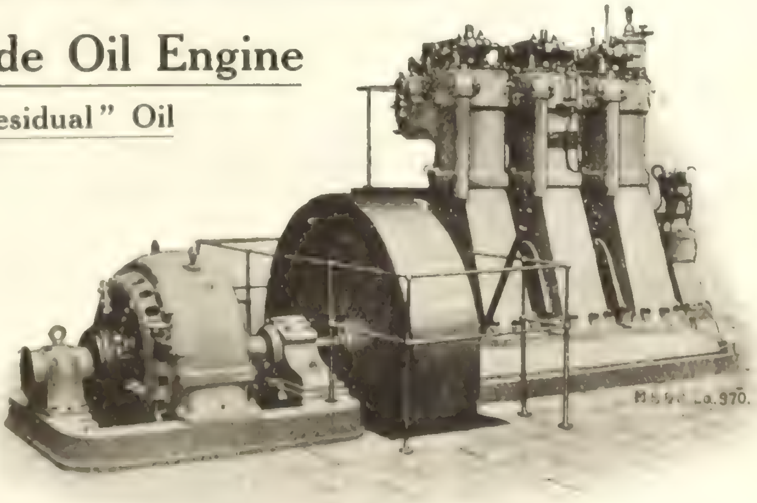
CITY CO MARCH

Tile and Pipe Machinery, and
CLAY WORKING PLANT
for all classes of Clays and Shales.
INQUIRIES SOLICITED. CATALOGUES POST FREE.
Established over 75 years. TELEGRAMS: Brictile, Preston
Representatives in Canada: Messrs. Chambers & Simpson, Engineers, Toronto

The Canadian Boving Co.
164 Bay St. - TORONTO
(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent
No Smell No Noise No Smoke
Suitable for Public and Private Buildings

The Mirrlees-Diesel Crude Oil Engine
uses "Fuel," "Gas" or "Residual" Oil



No Ignition Gear
No Producer
No Chimney
No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdowns
Cheaper Buildings and Foundations
Unskilled Labour only
No Standby Losses

HIGH SPEED SLOW SPEED

35 to 1000 B. H. P.

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

Manufacturing 60 inch pipe for the Low Level Interceptor, Toronto.

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

Write for Illustrated Catalog

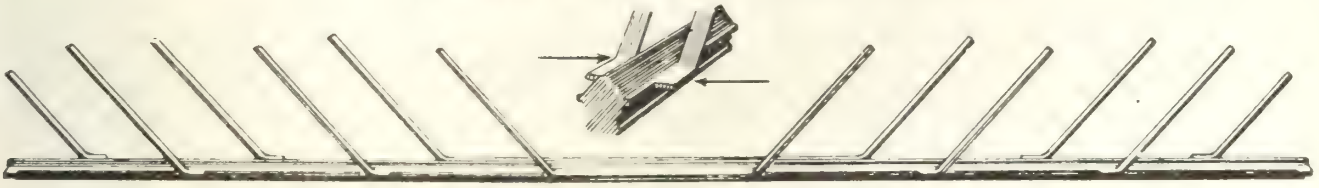
QUEBEC AND ONTARIO
Francis Hankin & Co.
231 Coristine Bldg., Montreal
199 Yonge St., Toronto

MANITOBA, SASKATCHEWAN AND ALBERTA
F. H. McGavin Company Limited
103 Osborne St., Winnipeg

BRITISH COLUMBIA
Pacific Lock Joint Pipe Co.
1005 A St. Tacoma, Wash.
Globe Bldg., Seattle.

KAHN SYSTEM

OF REINFORCED CONCRETE



Note Rigid Connection of Shear Members

HY-RIB---

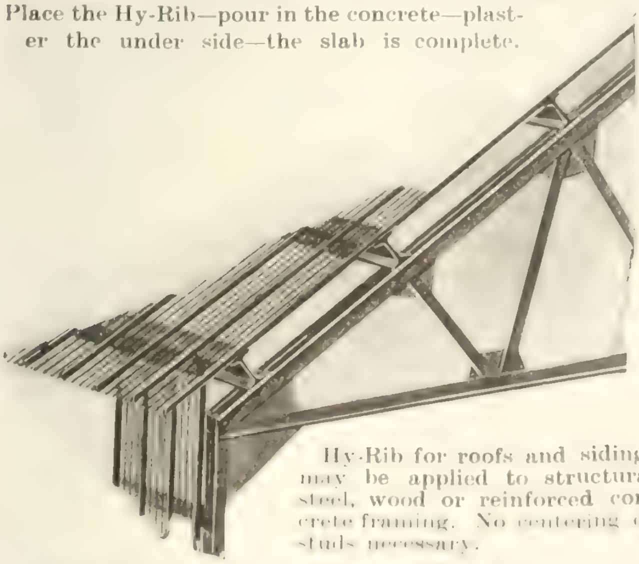
A Steel lath with deep stiffening ribs made from the same Sheet of Steel.

Furnished in three weights of metal, Nos. 2, 3 and 4
Ribs 13-16 inches high and 3½ inches center to center.
Sheets 10½ inches wide center to center of outside ribs.
Standard Lengths—6 ft., 8 ft., 10 ft., and 12 ft.

FLOORS AND ROOFS

Hy-Rib serves as reinforcement and centering for concrete floors and roofs, doing away entirely with falsework.

Place the Hy-Rib—pour in the concrete—plaster the under side—the slab is complete.

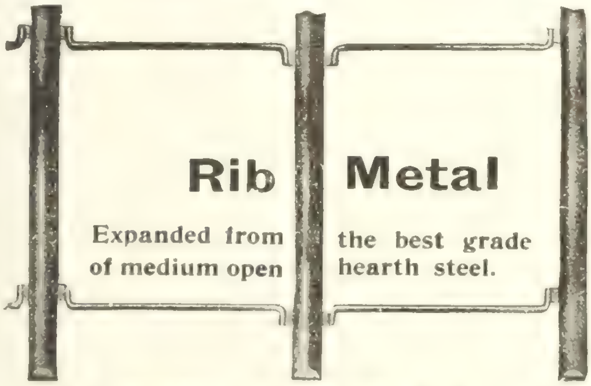


Hy-Rib for roofs and sidings may be applied to structural steel, wood or reinforced concrete framing. No centering or studs necessary.

Flood Your Building with Light by Using

United Steel Sash

It is fireproof, permanent, strong, rigid. You can increase the light and thereby increase the efficiency of your staff.



RIB METAL

A Steel Mesh Reinforcement for Concrete Floors Roofs, Walls, etc.

Made in Sheets up to 18 feet in length, out of the one piece of material.

Greater effectiveness than any other similar material.

Easy to handle.

Other KAHN SYSTEM Products are Kahn Truss Bars, Rib Bars, Column Hooping and Trus-Con. Chemical Products.

TRUSSED CONCRETE STEEL COMPANY OF CANADA
LIMITED

Head Office and Works, Sales and Engineering Office:
WALKERVILLE, ONT.

BRANCH OFFICES:

Union Bank Building, Winnipeg: 23 Jordan Street, Toronto: Corner St. James and Dalhousie, Quebec; 52 Hutchinson Building, Vancouver; 28 Bedford Road, Halifax; 128 Coristine Building, Montreal

KAHN SYSTEM Reinforced Concrete

KAHN SYSTEM Reinforced Concrete

Talk As You May About Mixers

You Cannot Get Away From This Fact

that no high charging mixer is complete without a charging elevator; that full one-third of the power is required to operate the loading device; that one-third of the attention is required to operate it; that charging skips get out of order quickly, and that you save all of this needless expense in the low charging direct from barrows.

Eclipse Concrete Mixer

The Only Low Charging Batch Mixer

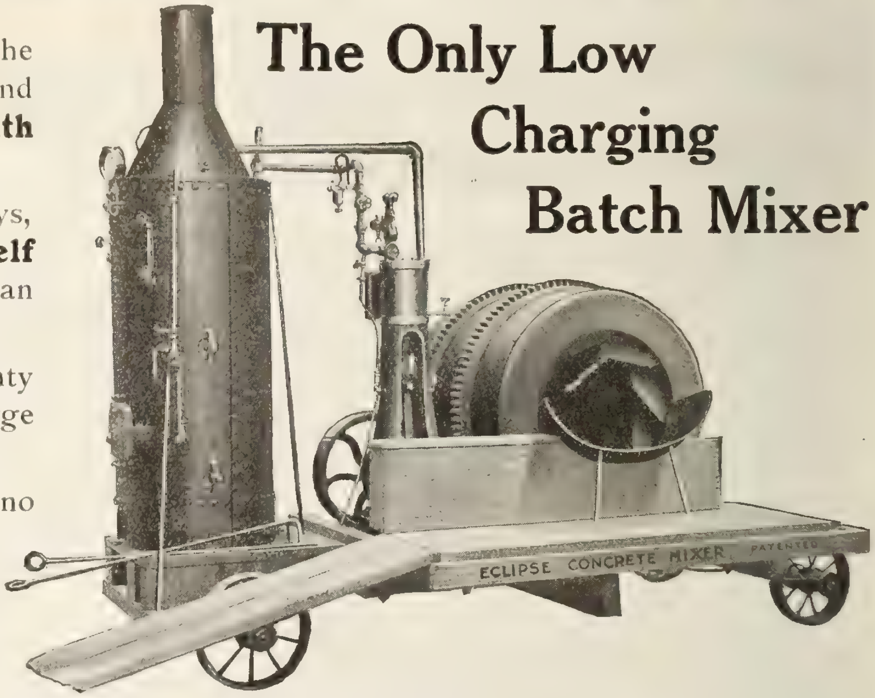
It is charged 2 feet from the ground and both platform and approaches are **portable with** the mixer.

There's no building of runways, its a **complete** machine in **itself**—simpler, cheaper and better than any other mixer in existence.

But there's another mighty important feature in the large open drum.

It's self-cleaning and there's no "slop."

More important still is the fact that you can see the entire batch when mixing— there's no **guess work,** you know when the batch is completely mixed.

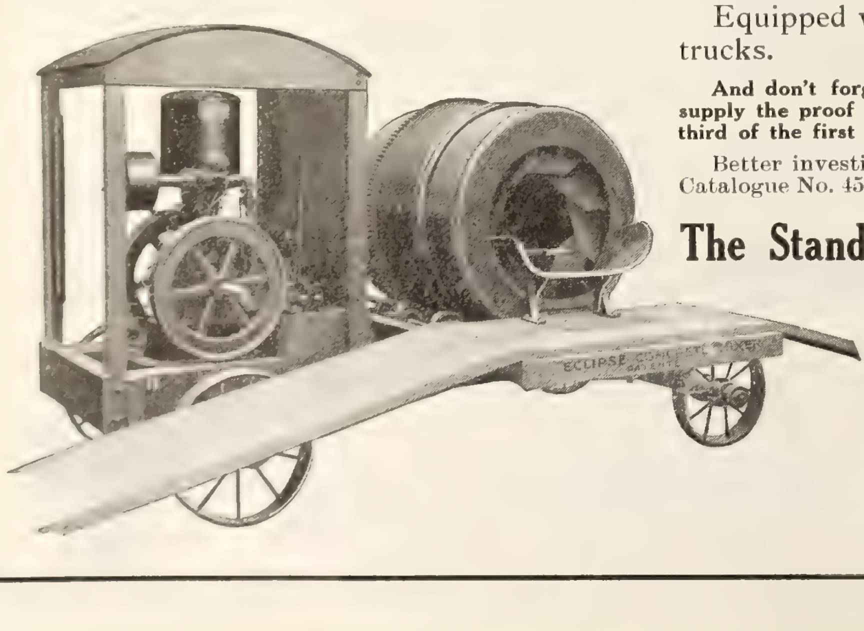


Quickest discharge and discharge always under perfect control and operated from either end.

Equipped with highest grade engines and trucks.

And don't forget we mean exactly what we say and can supply the proof that it saves one-third of the cost — one-third of the first cost and one third of the operative cost.

Better investigate the cost-saving of the Eclipse Mixer. Catalogue No. 45 by first mail if you say so.



The Standard Scale & Supply Co.

CHICAGO 1345-1347 Wabash Ave.
PITTSBURG 243-245 Water St.
PHILADELPHIA 35 South Fourth St.
NEW YORK 106 West Broadway

Bored Colonial Columns

We make a specialty of bored and fluted Colonial Columns and verandah material. In these columns there are no joints to open, and we can guarantee our Columns not to split.

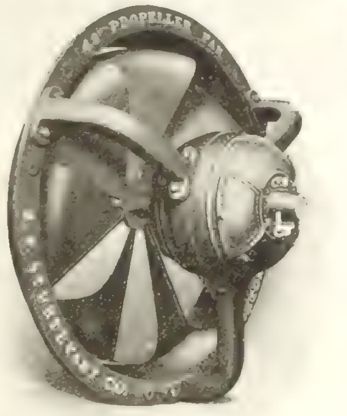
M. Brennen & Sons Mfg. Co., Ltd.
HAMILTON, ONTARIO

THE REMEDY

FOR THAT HOT AND STIFLING ROOM
IS A

Sturtevant

Electric Propeller Fan



¶ They increase output, reduce sick leave, and raise efficiency of workers by keeping the air fresh and cool.

¶ Easily and cheaply installed, the first cost is small.

¶ The scientific design and construction of fan blades makes possible the moving of immense volumes of air at small expenditure of power.

¶ These fans are invaluable for use in workrooms, offices, kitchens, billiard halls, and in all places where heat, smoke or fumes are to be removed.

¶ Our engineering staff are always ready to make suggestions if you will inform us of the conditions to be met, the size of the room, etc.

B. F. STURTEVANT COMPANY
HYDE PARK, MA.

Eady-Douglas, Limited Montreal
Polson Iron Works, Limited Toronto
859

Do You Think that you can Afford

to pass us by before getting our prices on your requirements or before putting in your tenders on

Plate Sheet Fancy
or any kind of
Glazing Glass

The
Consolidated Plate Glass Co.
of Canada, Limited

TORONTO MONTREAL WINNIPEG

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WESTERN CANADA CONTRACTOR AND BUILDERS GAZETTE

Builders Supplies

Contractors Machinery

IF YOU REQUIRE BUILDERS IRON WORK CONSULT US

Western Iron Works

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building Winnipeg

WHEN YOU THINK OF METAL CEILING THINK OF "GALT"

"Galt" Art Metal Ceilings are sold strictly on their merits, their **mechanical superiority** and faithfulness to art in styles they typify.

Machine-cut beads (patented process) make them easy to apply. Plates snap into place and seams fit snugly together. Why waste your time puttying and peening the joints on old-fashioned stuff when the new is here and costs less?

Write us about your Metal Ceiling work

THE GALT ART METAL CO.,
GALT - ONT.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.
Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange

COFFERDAMS
AND CONCRETE WORK

Cofferdam at Southampton; 40 feet x 12 feet, 14 feet deep.

We are experts at this work and before you close a contract, get our figures. We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

The Contractor's "Money Saver"

Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment --- Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto—write us **to-day.**

MACHINE
PAYS FOR
ITSELF
IN A FEW
DAYS.

"Little Giant Floor Scraper"

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

Tel. Main 4155

We are now in the

Sand Business

Our Wagons hold 2½ Yards

High Grade Sand and Prompt Delivery

Rogers Supply Co.

28 King St. West,

Toronto

WHY IS KITON

Superior to Ordinary Tar?

BECAUSE:

KITON is free from inflamable organic solvents, and therefor far less combustible than tar.

KITON is soluble in water, and in this diluted form can be applied to any surface, whether rough or smooth, hot or cold, wet or dry, as easily as paint. As soon as once dry, **KITON**, like Tar, is absolutely insoluble in water and permanent. Hence its use for

Weather and Waterproofing

KITON will cover a larger area than the same weight of tar

KITON will do the work better and quicker.

KITON is so easily handled.

KITON needs neither fire nor tarkettle.

KITON will never run, if exposed to the heat of the sun.

KITON will stick positively to any surface.

KITON will take any whitewash, or a finish coat of plaster or cement.

KITON can be coloured.

KITON has none of the drawbacks of tar, but has all of its advantages, and then some.

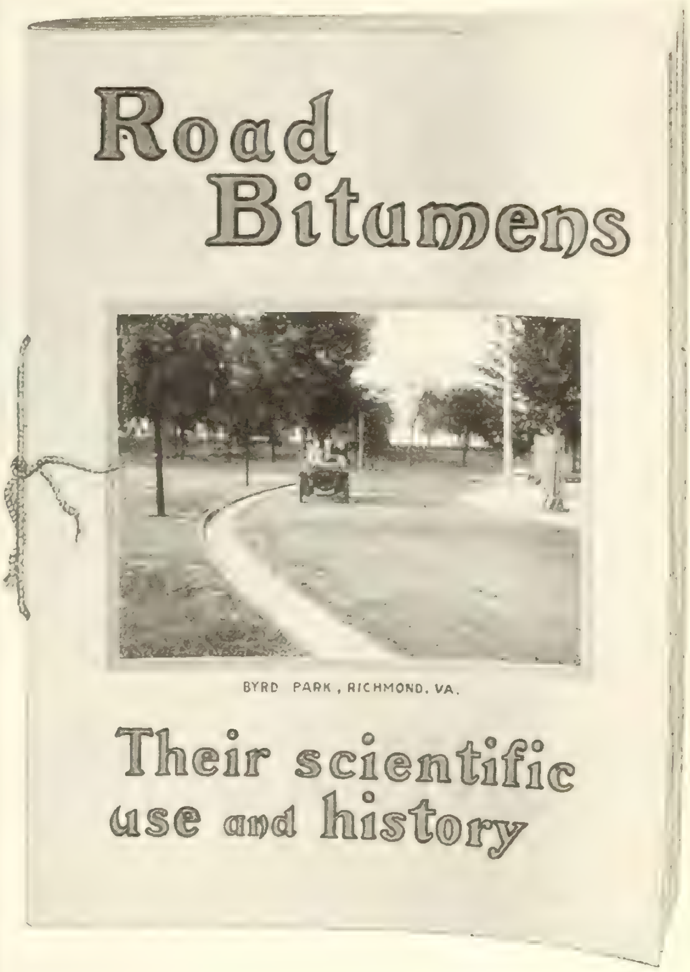
KITON is cheaper in the long run.

ASK FOR PRICES AND SAMPLE!

F. P. Mansbendel

General Distributor for Canada

212 Huron St., - Toronto, Ont.



Road Bitumens

BYRD PARK, RICHMOND, VA.

Their scientific use and history

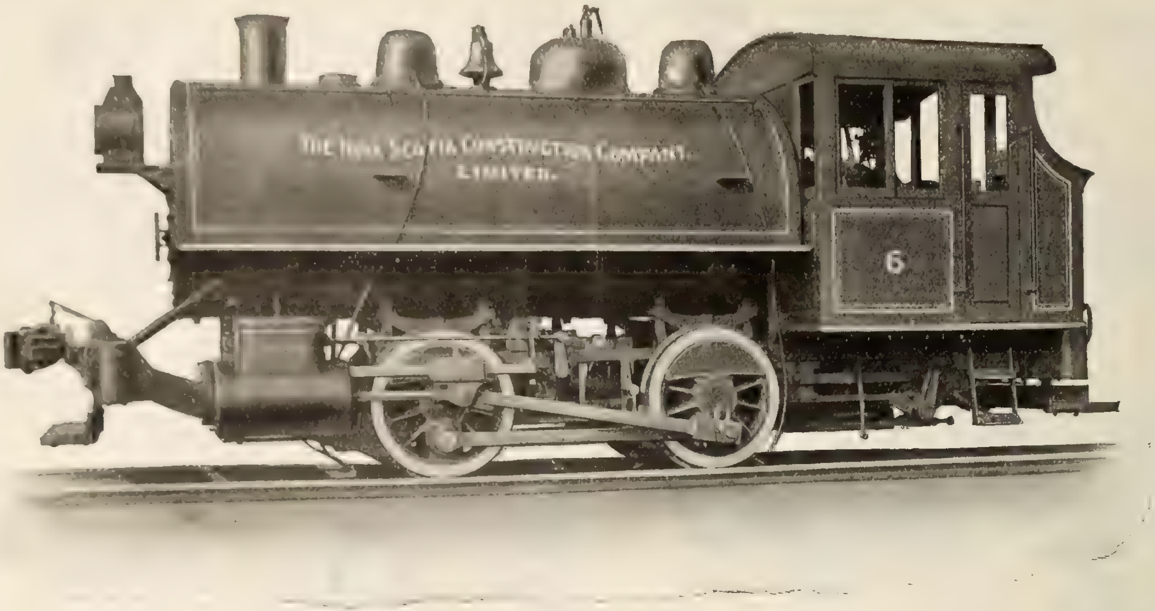
There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a phamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement Company

First National Bank Building

CINCINNATI



CONTRACTORS LOCOMOTIVES

This company has built locomotives of all types, capacities and sizes for every kind of hauling.

Our small locomotives for contractors and light switching service are not merely selected from designs previously built, but are special designs to meet special requirements. They are designed and built with the same care required for 200-ton locomotives. Only the best materials are used in their construction, and every part is made to jigs or templates, guaranteeing that repair parts will fit.

They are constructed with a view to the fact that they must sometimes be operated a considerable distance from shop facilities, therefore simplicity and sturdy construction are vitally necessary.

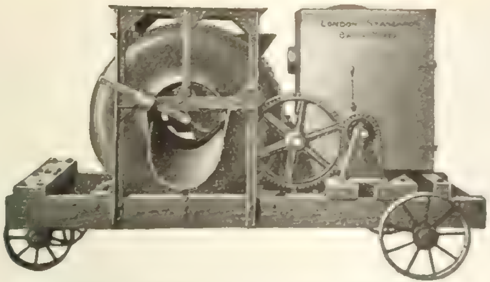
Fuel cost is always important. This is considered in the design and capacity of the boiler, and in the design throughout.

Write us concerning your requirements, or ask for a consultation with our engineers.

We are in position to meet every requirement in locomotives, and to supply repair parts at short notice from our Works at Longue Pointe, Montreal, Canada.

MONTREAL LOCOMOTIVE WORKS, LIMITED

OTTAWA BANK BUILDINGS, MONTREAL, CANADA



London Standard Drum Batch Mixer No. 1
Equiped with Gasoline Engine

London Standard Batch Mixers

THE LONDON STANDARD DRUM BATCH MIXERS are made in four sizes, namely, one-third yard, one-half yard and one yard batches and are furnished with any equipment.

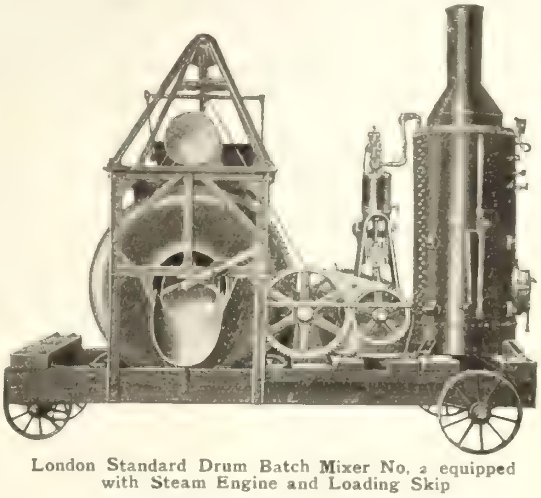
THE MANY NEW AND IMPROVED FEATURES of the London Standard Drum Batch Mixers appeal to every contractor desiring a mixer of this type. WE CAN GIVE YOU THE BEST VALUE FOR YOUR MONEY of any Firm doing business, BECAUSE we manufacture only Concrete Machinery, and on this account we can sell you a machine at very much less cost than Firms who do not manufacture their own machines but handle a concrete mixer along with other lines of goods.

We also Manufacture—
FACE-DOWN BLOCK MACHINES
CEMENT BRICK MACHINES
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES
SEWER PIPE MOLDS
ORNAMENTAL MOLDS SILO CURBS
ADJUSTABLE SILL, STEP AND WINDOW
CAP MOLDS FRICTION HOISTS

And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.

London Concrete Machinery Co.
Limited
19 Marmora St., LONDON, CANADA



London Standard Drum Batch Mixer No. 2 equipped with Steam Engine and Loading Skip

We are the Largest Manufacturers of Concrete Machinery in Canada

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N. S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.

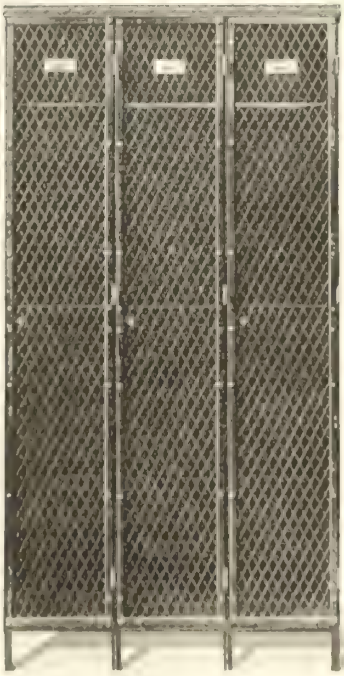
No Wet Cellars No Damp Basements

Ceresit is a cream white paste readily dissolvable in water. This water is used instead of plain water for mixing Cement, Mortar or Concrete.

Ceresit Waterproofing Co.
115 Adams Street, Chicago

Canadian Agents
Eadie Douglas, Limited
Montreal, Toronto, Ottawa
Grose & Walker, Limited, Winnipeg
[illegible], Vancouver

'Meadows' Metal Lockers



Make friends because of their substantial construction and unique features. We make several styles and sizes of these lockers. We'll know what you want if you just hint at your requirements.

Send for our interesting booklet entitled
"Locker Lore"

GEO. B. MEADOWS
Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA

The Ford Iron Co.
485 St. James Street
Montreal

Write us for our Bulletins

GYRATORY BREAKER

We can also supply our

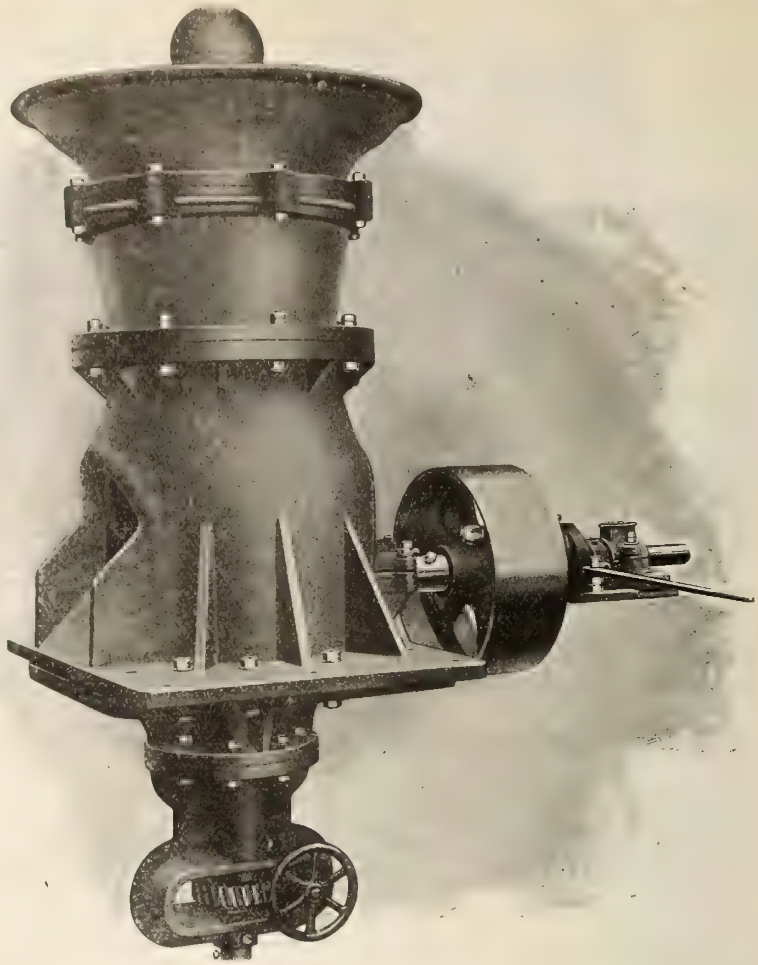
ACME
Fixed Stone Crusher
Portable Stone Crusher
with or without screens

ACME
Portable Automatic Stone Breaker

RANSOME and M-C Concrete Mixer

HUMBOLDT Machinery

BRUSH Electrical Machinery



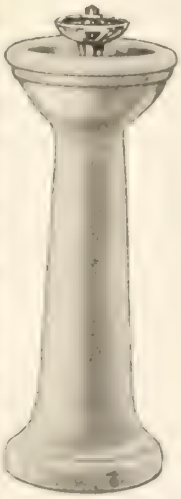
SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

THE STANDARD
COMPANY LIMITED
GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA

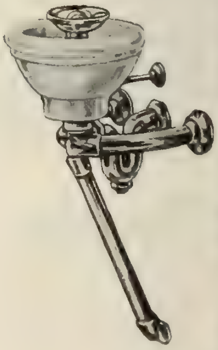
Contagious diseases are spread by drinking out of contaminated glasses, cups and similar vessels, for in that manner one comes in almost direct contact with the mucous membranes of preceeding drinkers.

With our Porcelain Enameled Bubbling Drinking Fountain the drinker cannot touch the cup; he gets a drink of running water with more security than from a fire clay fixture as our ware is positively non-absorbent

Advocate these fountains and reduce the spread of contagious diseases.



F. 290



F. 292

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 June 21, 1911 No. 25

Concerning Certified Cheques and Other Sources of Trouble in Contracting

A growing cause of complaint among contractors is the excessive deposit required with tenders. There is no objection to putting up a reasonable sum, but a great many corporations ask for a deposit of 5 to 10 per cent., apparently without any regard to the amount of the contract. Such a requirement, on a large undertaking, often amounts to many thousands of dollars. It is this feature of the practice which is rightly considered unreasonable. And it is not only unreasonable, but it is against the best interests of the work, for it means less competition. Some of the best men in the business find their money held up sometimes, and it is not every contractor capable of taking a $100,000 contract who can always post a certified cheque for $10,000, or even $5,000 in the case of a deposit of 5 per cent.

Now we contend that for small contracts, up to say $10,000, a deposit of 5 per cent. is not unreasonable, but in the case of larger contracts the percentage might well be reduced. In many cases it would be quite sufficient to stipulate a certain reasonable sum. If the object of these certified cheques is only to insure the bona fide intentions of the bidder, then this end would be attained by a cash deposit of a thousand dollars or so, even in the case of contracts of $50,000 and upwards.

If it were the custom all over the world to demand this excessive deposit it would tie up a tremendous amount of money in the case of the larger concerns, some of which have as many as 200 branches. Fortunately the Canadian field is an exceptional one, but supposing it were not, and assuming that the same conditions obtained everywhere and that each branch of one of these big companies had tender cheques out ranging from $5,000 to $10,000, it would mean a total sum of from $1,000,000 to $2,000,000 standing idle purely on deposit against tenders. Apart altogether from any consideration of the bonds that would be required upon the award of the contracts. We fail to see why Canadian corporations should adopt such an arbitrary practice and require so large a guarantee of good faith.

In England, in the case of practically all public work it is customary to forward specifications and full information (such as bills of quantities in the case of building contracts), upon receipt of a cheque varying from $15 to $25, the return of the cheque being guaranteed upon receipt of a bona fide tender.

The deposits required in the case of a number of contracts that we have selected at random from recent issues of our London contemporaries are indicated below:

Erection of H. M. Stationery Office and Office of Works' Stores, London.. ...	3 guineas
Erection of Barracks at Dover	10 shillings
Erection of Public School Building at Macclesfield	2 guineas
Asphalt paving repairs, Tottenham ...	5 pounds
Supply of approximately 400 tons of cast iron pipes and specials, Southend-on-Sea	5 guineas
Construction of locks, sluices, weirs, bridges, river sidenings and dredging on the River Medway	10 guineas

In the above list it will be seen that the range is confined practically to from $2.50 to $25, the requirement of $50 in the last named undertaking being exceptionl owing to the comprehensive nature of the contract. Can it be that English contractors, labor and material are so superior to our own that a nominal guarantee in their case is considered sufficient?

Holding up Deposits

A custom which cannot be condemned too strongly is that of retaining the tender cheques for a considerable period after the award has been made. A leading firm of Toronto contractors recently told the writer something of their experience in this regard. They have lately had several good sized cheques held up for three or four months in spite of the provision in the specification that the deposits would be returned upon the signing of the contract, or at any rate within sixty days.

A further cause for complaint, which happily is not reported very often, is that in some cases tender cheques, although accepted by the bank, have been actually cashed and the cost of exchange charged.

It seems to us that half the people with whom contractors have to negotiate are indifferent to the best interests of those they serve, and that the other half have an ignorant over-estimation of the financial resources of the contractor. There are a few, it may be, who have adopted the old fashioned principle of getting on "the safe side"—irrespective of the cost.

The contracting community should take a firm stand in matters of this kind. No improvement will ever come but by persistent effort, and it must be united effort at that.

We have heard numerous complaints in connection with the matters discussed above and we would be interested in knowing more of the experience and views of our readers.

The G. T. P. has effected an agreement with the city of Prince Rupert, B.C., whereby it has agreed to start work at once on a two and a half million dollar dry dock, a hotel to cost one million dollars, station, round houses, shops, etc

Stability and Progress of Canadian Produce

An examination of the comparative tables which have just been issued by the Department of Trade and Commerce for the fiscal year ending March 31, 1911, showing details of the trade of Canada for the year as compared with the year previous shows that Canada has taken a long stride forward in her progress as a commercial nation. The total of imports for consumption and exports was $759,000,000, greater by $82,000,000—over 12 per cent., or one-eighth—than that of the previous year, which was also a record maker in point of trade. To this total may be added $10,000,000 of imports which were not entered for consumption, making the grand aggregate of Canadian trade for the year $769,000,000—about $76,000,000 increase over the previous record. Imports for consumption show an increase of $86,000,000—almost 23 per cent. Of this increase about two-thirds was dutiable goods, and the customs duties collected were greater by $12,000,000—20 per cent. or one-fifth—than in the previous year.

Compared with the year 1909-10 total, exports show a decrease of about $4,000,000, but compared with the greatest year total previous to 1909-10 the increase is over $17,000,000. The decrease is due to a drop of $8,000,000 in agricultural products and to slightly lower totals in the animal and forest classes. To counterbalance this there is an increase of almost $4,000,000 in the amount of manufactured goods exported while the mines gave an increase of $2,700,000.

A decrease in total exports does not necessarily show lessened demand for Canadian goods abroad, but rather a decrease in the amount of goods available for export. On the other hand, an increase in the export of manufactured goods indicates the growing popularity of Canadian products in other countries.

It must be borne in mind that foreign trade is subject to fluctuations which it is impossible to control and difficult to explain. From these variations Canada suffers probably less than any other commercial country in the world, and the steady and rapid increase of her business in the world market and the infrequency and small importance of the periodical reactions are outstanding features which prove the stability of her commerce and guarantee her advancement in the years to come.

Increase in Area of Field Crops

A recent bulletin of the Census and Statistics office issued to-day states that the season this year has been favorable for field crops in all parts of Canada, and excellent reports have been received from all the provinces. The lowest percentage of condition is made for fall wheat, which suffered from inadequate protection in the winter months, and also to some extent from spring frosts. The areas of fall wheat are greater than last year by 4.50 per cent and of spring wheat by 13.70 per cent. The total area in wheat is 10,503,400 acres, as compared with 9,294,800 in 1910 and 7,750,400 in 1909. The per cent. condition of fall wheat at the end of May was 80.63, and of spring wheat 96.69. The area in oats is 10,279,800 acres and its condition 94.76, as compared with 9,864,100 acres and 93.95 per cent. condition last year. Barley and rye each show a small decrease in area, but the condition is higher than at the same period last year. Slight decreases are also reported for areas of peas, mixed grains, and hay and clover, with per cent. condition of over 90. Hay and clover have a reported condition of 91.45 for the Dominion, being practically 100 in Manitoba, Saskatchewan and Alberta. The area of the field crops named is 32,051,500 acres for 1911, compared with 30,554,200 acres for 1910 and 28,194,900 acres for 1909. In the provinces of Manitoba, Saskatchewan and Alberta, the area in wheat, oats and barley was 3,491,413 acres in 1900, 6,009,389 acres in 1905, 11,952,000 acres in 1909, and 13,809,300 acres in 1910, and it is 15,355,500 acres this year. The increase of these crops from 1900 to 1911 was 2,663,699 acres in Manitoba, 7,364,315 acres in Saskatchewan and 1,836,073 acres in Alberta.

The Window Glass Trade

England and Belgium are the sources of supply to Canada for window glass. Usually in the opening of Montreal navigation very large importations arrive by the early boats. This has not been the case this year, however, for various reasons. Trade for the past year has been exceedingly brick in England, consequently the home demand has been far above normal. This, together with the fact that the South America markets have very largely increased their purchases of window glass from England, has made it exceedingly difficult for the English manufacturers to make Canadian deliveries in the usual quantities.

So far as the Belgian manufacturers are concerned, they have benefited by the good times in England, and as a result of the continued improvement in the quality of Belgian manufacture, the trade of that country controls about 80 per cent. of the English demand. This has had its effect on prices, which have advanced since last fall about 20 per cent. The manufacturers also are banded together in a very strong syndicate whose tendency is toward a further advance in view of the scarcity of the supply and the approaching mid-summer shut-down. All of this means that window glass for the present year in Canada is going to be both scarce and higher priced. Up to the present time Canadian importers have not advanced their prices to cover the advance made by the manufacturers, but as the present stocks on hand are depleted, a considerable increase must be demanded by the jobbers.

Window glass is one of the few commodities which in the last five years has been constantly decreasing in price. To-day it is sold in Canada at lower figures than ever before. This is not attributable to decreased cost of manufacture, but to the exceedingly keen competition existing in the trade.

Building Supplies in Cuba.

According to a report from Havana, extensive docks are being built in Cuba, and large quantities of cement and structural steel will be needed. The structural work is in the hands of the MacArthur Perks, Limited, Havana, with whom Canadian firms should correspond if they desire to quote prices.

Contractors are extremely busy laying a sewerage system, paving the public streets and laying out extensive residential quarters. This should present an opportunity to place creosoted wood block, hard stone paving blocks, sewerage pipes, etc. The contractors are the Cuban Engineering Company, of Havana, for the sewerage, and the Uvalde Asphalt Paving Company, Havana, for the paving of the city.

Restricted Competition for Public Work

Some of the Reasons why many Contractors Refuse to Bid—Excessive Deposits — Form of Contract — Guarantee Clause

Competion in bidding on their construction work is what every city official and public engineer wishes, yet in too many cases the competition is restricted, and with this restriction comes graft, collusion and fraud. The idea is to throw public work open to the broadest competition, yet the laws surrounding bidding in some cases, the manner in which specifications are drawn up, the form of contract and many other things throttle competition, until to-day many contractors refuse to bid upon public work, especially in some of the cities, and the awarding of contracts has in some cases become a farce, and even a blot upon the business of contracting.

Excessive Deposits

First of all competition is throttled in making proposals. The rules governing bids generally provide for a certified check of ten per cent. of the total amount of the proposal. Sometimes a lump sum is named for the amount of the certified check, but the sum named is generally about ten per cent. of the engineer's estimate. This deposit of a certified check is often a hardship upon contractors and prevents many hard working and responsible men from bidding.

A contract for half a million dollars means a certified check for $50,000, and even a contract for only $30,000 means a check for $3,000. Thus a contractor who may have the plant and ability to undertake the first job, may be prevented from bidding by not being able to put up a certified check for $50,000. The subject of this check too is to show the standing of the bidder and to compel him to enter into a contract, if the contract is awarded to him. This can be accomplished as well by a bidder's bond, or the contractor can be given the choice between a bidder's bond and a certified cheque. This feature of public bidding limits competition. Several years ago a contractor was asked to make up a bid for a bulkhead, the bidding price being not quite $60,000, for which a certified check for nearly $6,000 had to accompany the proposal. On the day of submitting the bids, the contractor was disappointed in obtaining the certified check, so he could not bid. Only two contractors made bids and the work was awarded to the one, whose bid was about four per cent. higher than the contractor who was prevented from bidding. This contractor could have obtained a bidder's bond, as he had done so frequently. There is no doubt that he could have finished the work at a profit, for within a month he obtained a contract for about $70,000 worth of similar work in the same locality from a railroad company, at smaller prices and finished this work ahead of the contractor in the municipal work, and with a handsome profit

The Forms of Contract

The next feature that restricts competition on public work is the form of contract. It is true that during the past decade many forms of contract have been wonderfully improved, but there are still a large number of contracts, which many responsible contractors would not care to sign. Contractors when they can obtain plenty of work from private corporations, will not bid on public work, or if they do bid it is only to set high prices on the job. Naturally, a contractor must be held to the obligation he assumes, but this is done by private corporations with more equitable forms of contracts.

Specifications are so drawn that competition is often throttled, and at the same time a premium is often placed on dishonesty. Only recently the writer in reading a set of specifications for city work, saw a clause that stated that the work to be done under this contract and specification should be better than that known as "first class." This would seem to be a joker, and the contractor is the one to pay for the joke. Such a clause or provision would seem to be written in a set of specifications for the purpose of allowing the inspector on the work to mulct the contractor.

First class work is supposed to be the best there is, so a provision that calls for work of a superior quality to the best, means that the inspector can so wrong the contractor, that the latter will gladly effect any settlement with the inspector that will allow him to go on with his work. Such things are wrong, but when specifications put such opportunities into the hands of an underpaid man, it is compelling a contractor to be dishonest or else be worried beyond endurance, besides having his work cost more money.

Plans and specifications are likewise so drawn as not only to add to the cost of the work, but to limit competition. These things seldom occur on work done for private corporations, consequently it is possible to eliminate them from public contracts.

The Guarantee Clause

Another feature that has a tendency to limit competition is the guarantee clauses, that is embodied in so many contracts. A guarantee that covers a patented article or method might be advisable, but on ordinary construction, where plans can be made by the engineer in charge and the proper inspection is given the work, there is no need of a guarantee, not even for materials, for tests of all materials can be made in laboratories before they are placed in the structures.

When a guarantee was given in shops of a maintenance bond the conditions were not so bad, but now many cities are demanding cash deposits as guarantees, ranging from five to ten per cent. of the value of the work. This will tie up within a few years, if the practice would become general, many thousands and possibly millions of dollars, which would otherwise be used in contracting. Thus some men, for lack of capital that they cannot afford to have tied up in this manner, would be able to undertake public contracts, especially those that call for a cash guarantee.

These are the many ways that competition is throttled on public work. The remedy is simple, namely, to make such changes that collusion and graft will be entirely eliminated, and allow all competent and reliable contractors to bid upon public contracts. In advocating this it does not mean that inexperienced and unreliable men should have the bars thrown down to them, for it is not the idea to lower the standard of work to be done for the public, but rather raise that standard.

The greater competition is on work, the higher the standard of construction is likely to be. It is a fact that if a large number of competitors are anxious to obtain a job the successful bidder will give a good class of work, while if a man feels that the work has come to him easily, he will also feel that he can do as he pleases, and will do an indifferent class of work, and if graft enters into the letting, the work will be skimped and slighted whenever possible.

Many examples could be given and much more could be said, but there can be but one opinion on such an important subject, namely, that there should be genuine competition and honest work free from all graft. These ends can be obtained if the remedies pointed out are applied.—The Contractor.

The Rochester and Lake Ontario Water Company's Filters

The water purification plant of the Rochester & Lake Ontario Water Company, at Charlotte, N. Y., obtains its supply from Lake Ontario through a 24-in. cast iron intake pipe extending 4,000 ft. from the shore into water 40 ft. deep. The water is sold in a part to Rochester and to several of its suburbs. The plant consists of a 430,000-gal. coagulation basin and eight pressure filters, having a sand area of 200 sq. ft. each; there is a pressure of 235 lb. per sq. in. on the filter. The sand in the filters is about 3 ft. in depth, has an effective size of 0.46 mm. and a uniformly coefficient of 1.51. The operation of the plant has been directed by Mr. James M. Caird, consulting engineer, of Troy, N. Y., and the following notes regarding the results obtained have been taken from his report to the company for the year ending March 31, 1911.

The total amount of water filtered was 1,508,787,278 gal., and of this quantity 1,484,939,891 gal. was delivered to consumers. The number of filter washings during the year was 1,448 and the percentage of wash water 1.58, as against 2.96 per cent. during the previous year. The turbidity of the lake water in parts per million averaged 11.3 ranging from 180 to 0; 0.64 grains per gallon of sulphate of alumina and 0.053 grains per gallon of calcium hyphochlorite were used. The turbidity was over 50 parts per million on 43 days or 11.8 per cent. of the year while during the previous year it was over 50 on 29 days, or 7.9 per cent. of the time. The filtered water, Mr. Caird reports, has been practically free from turbidity during the entire year. The color of the raw water averaged 9.3 parts per million ranging from 75 to 0. There has always been more than sufficient alklinity in the raw water to decompose all the sulphate of alumina required for proper coagulation. The alklinity of the Lake Ontario water averaged 85.7 parts per million and the hardness 106 parts per million.

The average number of bacteria per cubic centimeter in the unfiltered water was 5,330, ranging from 75,482 to 40. The bacteria in the settled water averaged 30, ranging from 278 to 1 per cubic centimeter. The bacteria in the filtered water averaged 13 per cubic centimeter, ranging from 472 to 1. The coagulation basins removed about 99.44 per cent. of the bacteria, the filters 56.67 per cent, making the total bacterial removal 99.76 per cent. The bacteria per cubic centimeter in the unfiltered water was above 1,000 on 183 days, or 58 per cent. of the time, above 5,000 on 128 days, or 35 per cent. of the time, and above 10,000 on 78 days, or 21 per cent. of the time. The bacteria in the filtered water were less than 100 per cubic centimeter on 363 days, or over 99 per cent. of the time and under 25 on 325 days, or 89 per cent. of the time.

During the year B. coli were present in 451 out of 1,067 samples of raw Lake Ontario water; of 1,067 samples of filtered water B. coli were present in six samples. The total removal of B. coli for the year was 98.7 per cent.

During the year additional baffles were placed in the settling basins and the efficiency increased from 89.12 per cent. to 99.44 per cent. The increase in the basin efficiency lessened the work of the filters, and according to Mr. Caird should reduce the cost of operation by reducing the amount of wash water at the filters.

Water consumption at Springfield, Mass., a city of 88,926 population, averaged 119 gal. per inhabitant daily during 1910. Mr. Elbert E. Lochridge, chief engineer, states in his last annual report that 45.35 per cent. of the consumption is metered.

The Root River bridge is constructed over the Root river in the township of Tarantorus, Ontario. At this point a big jam caused a washout at the old bridge, and the old structure was extended to cross the new channel. A new reinforced concrete girder bridge of 30 feet clear span is constructed over the new channel, and an 8 foot concrete arch was constructed on the old channel. The abutments are concrete. The abutments and wing walls are on hard pan foundations. The 6 inch concrete floor is reinforced with No. 6 floor mesh, and is supported by concrete girders 26 in. deep, reinforced with Kahn bars. The two middle girders are 16 inches wide and the two outside girders are 14 inches wide. The bridge and culvert are supplied with a pipe railing. Considerable filling was necessary, as the old bridge was 64 feet long. The bridge, culvert and filling cost $2,575. The work was done under the supervision of J. O. Coates, Foreman Public Works. This is a class of structure that might profitably be adopted for highway bridges up to 35 foot span. The construction is simple; no skilled labor is required other than a good concrete man. The bridge is comparatively cheap and is everlasting.

If you have a wall of brickwork, and the bricks are very soft, then broom down and apply a size of acid water, just enough muriatic acid to sour the water. Let this be rinsed off with clear water, let it dry, then apply all the raw oil the wall will take. This is for a first-class job, and the oil will prevent the chipping of the brick afterwards. The oil makes the soft bricks harder, and also waterproof. Hard bricks will not need so much oil. Where the wall has been filled with raw oil the first coat of paint should be of good quality, and according to what the finish is to be; if to be painted like wood, it should be thinned with oil and turpentine until the last coat, which should be done with all oil. But if a dead brick finish, then use all turpentine color, for the finish, though the priming may be all oil, and the next coat or two, half and half, as the dead effect is surer on a partly lustrous ground, or on a perfectly full lustre.

Transcontinental Viaduct at Winnipeg

Details of Noteworthy Work now well under way Difficulties Encountered at the Seine River—Heavy Piling Required—Crossing Nine Streets

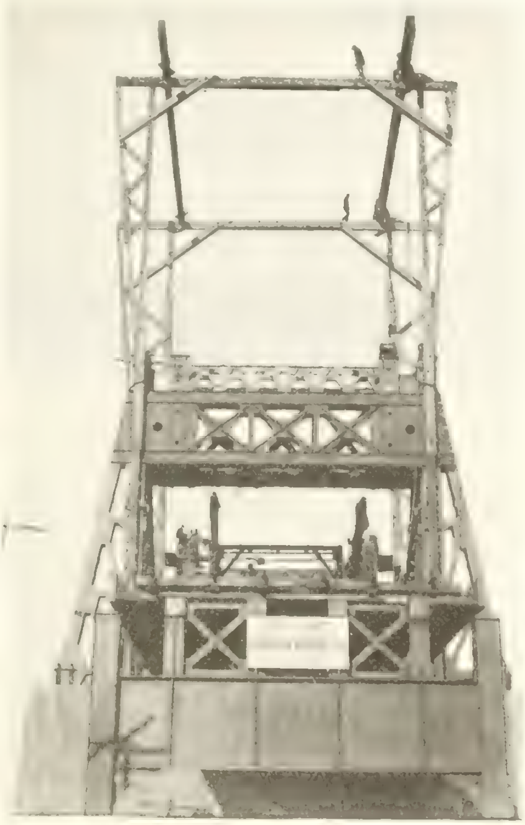
The last gap in section F. of the Transcontinental Railway is being rapidly closed up. It is the stretch of about five miles between Transcona and Winnipeg. The original survey of the entry into Winnipeg called for level crossings through Elmwood and St. Boniface. This plan was objected to from several quarters, notably the C. P. R., the city of St. Boniface and the C.N.R. The railway companies objected because of the several crossings which would be made of their lines, and the city because of the many streets which would be cut.

Piers of the Transcontinental viaduct at the crossing of the Seine River in St. Boniface.

When the matter was brought to the attention of the Railway Commission a change was ordered, and the high level plans, as finally prepared, were approved. These called for the abandonment of several miles of work already completed by J. D. McArthur, up to the city limits of St. Boniface. The new line swings slightly to the north after leaving Transcona and by an easy grade rises sufficiently high to go over all of the existing railway lines and streets.

The building of this huge viaduct has called for tremendous expenditures of money and labor. The majority of the piers and retaining walls are now in position and as soon as the main dump is ready, steel laying will be begun. At the east end of the new bridge across the Red River built at the foot of Lombard street in Winnipeg, the line crosses Tache avenue, the street being bridged with a single span. Between that point and the Seine River, a tributary of the Red, several streets are crossed, each being spanned by a plate girder bridge.

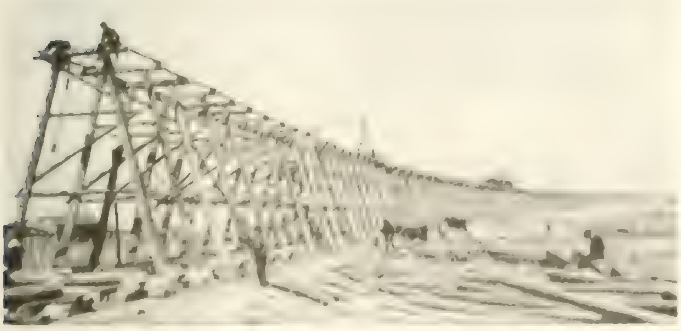
The Seine River proved a difficult piece of work, for the approaches were bad and the bottom poor.



The temporary framework for lifting parts of the lift span into position.

Heavy piling had to be driven to secure proper bearing surface, and on this solid monoliths of concrete have been built up. At this point there are two spans with approaches carried on steel piers with concrete footings.

A couple of hundred yards east of the Seine the big dump begins which carries the road until prairie level is reached. A temporary "peg leg" bridge of



Temporary trestle for building the dump of the viaduct

Terminal pier of the big dump, showing side retaining walls.

rough timber has been erected to facilitate the handling of the gravel of which the dump is being made, and twelve locomotives supplied by three steam shovels are placing the material as rapidly as it can be hauled into place. It will take about 500,000 cubic yards of gravel to complete this stetch alone.

There are also several stetches of this high dump between streets in St. Boniface which will have to be completed, and in all there are nine streets to be crossed. Once the dump has been completed it will be a simple matter to place the bridge spans, but there is little possibility of the line being completed before fall. The bridge across the Red River is almost finished there being but a few minor touches on the lift span. No especial haste is being made as the Canadian Northern are making slow progress on their section of the approach from the West. Their bridge across the Assiniboine River, east of the depot, has been hung up for several weeks. Deck plate girders were placed across the river, but many complaints were made with regard to the blocking of the river for navigation. The company are now waiting for the steel for the lift section. They have not started work on the subway across the south end of Main street, and complaints about the character of the work proposed for that point are now before the Railway Commission.

Combination retaining walls and piers at Tache Ave.

Canadian Railroad Construction

Railroad contractors in Canada have had no reason to complain over scarcity of work this season. The C.P.R., Grand Trunk Pacific and the Canadian Northern have been particularly active and let contracts this year for many hundreds of miles of new construction work. That the many contracts already let are by no means the end of the present season's construction plans is shown by the fact that tenders are now being publicly asked for two of the largest contracts of the year. One of these contracts calls for the construction of three sections of the Canadian Northern Ontario Railway, a subsidary line of the Canadian Northern. The sections on which tenders are being asked are: from Port Arthur to a point on the boundary line between the Districts of Thunder Bay and Algoma; from the end of section 1 to Kapuskasing Lake; and from Kapuskasing Lake to Sellwood Junction. Tenders for these three sections are to be received at Toronto, not later than July 1. The tenders are to include cleaning, grubbing, grading, bridges, track laying, etc., and all of the work is to be completed by October 1, 1913. The other contract for which tenders are now being asked calls for the construction of a 185-mile section of the Hudson Bay Railway, from Pass Mission to Thicket Portage. This railway is being built under the auspices of the Dominion Government, and the tenders will be received until August 1 by the Department of Railways and Canals at Ottawa. Tenders on the remaining sections of this railway will probably be asked early next year. In addition to the above, surveys have been practically completed for the construction of the Halifax & Eastern Railway and for the line around the north shore of the Bras d'Or Lake in Nova Scotia, which will be an extension of the Intercolonial system. Tenders for these works are to be asked at once. This work will also be done under the direction of the Department of Railways and Canals.

The Black Sturgeon Lake Bridge

The Black Sturgeon Lake bridge is constructed across the Black Sturgeon Lake, in the township of Mellick, Ontario. The bridge will afford the settlers in the township of Mellick access to Kenora. The bridge is a pile trestle 292 feet long, and consists of 17 spans, 15 feet centre to centre. The bents are of piles, 5 piles in a bent. The floor of the bridge is 14 feet above the water level. Cribs are built at each end on rock foundations. The caps and stringers are flatted pipe, and the covering is flatted tamarac 5 in. thick. The bridge is supplied with a substantial railing—posts 3 x 4, braces 2 x 6, and hand and hub rail 3 x 6, all of tamarac. The flooring is fastened down with half-inch spikes, 10 inches long. Caps are drift-bolted with 5-8 drift bolts, 18 in. long. The entire cost for work and material was $1,179.

C.P.R. Bridge at Lachine

The Foundation Company, Limited, on June 1st launched the first of a series of pneumatic caissons in connection with the foundations for the double tracking of the C. P. R. bridge across the St. Lawrence at Lachine. This caisson is quite different in construction and method of handling from that usually employed in such work. The caisson is built on a pontoon made in halves, the two parts being bolted together. After the caisson is constructed to the required height the pontoon is towed to the pier where it is to be sunk. The bolts holding the pontoon together are then pulled out and the water let in, which causes both the pontoon and the caisson to sink. While sinking, the two parts of the pontoon gradually separate, allowing the caisson to settle into position exactly where desired. In connection with this work the Foundation Company has finished two abutments on the north side, two land piers and ten river piers. There are still seven river piers to be put in.

Pneumatic Caisson

Dust and Its Prevention on City Streets

The Sources of the Trouble and Methods of Alleviation—Frequent Flushing Essential—Palliatives Wrong in Principle—Use of Light Oils

By Arthur H. Blanchard

Public nuisances shall not be tolerated within the city limits is a phrase to be found on all our municipal statute books, and yet repugnant, dirty, dusty streets are characteristic of practically all of our cities. Why should a people who spend vast sums of money for public improvements which add to the comfort of mankind submit to streets covered with dust and dirt of all kinds? One reason is that the large majority of the people of this country do not appreciate that it is economically possible to have clean and practically dustless streets and those who are familiar with cities where clean streets are the rule rather than exception have not the courage of the convictions to make an emphatic protest to those responsible or to carry the issue to the polls if necessary. The present is an opportune time for vigorously attacking the broad problem of prevention of dust on city streets, since it is slowly becoming recognized that clean streets contribute not only to the healthy condition of a city but also play an important part in attracting capital and desirable residents. One must have a callous mind indeed who can drive through the streets of Dresden at any time of the day and not be impressed with the spotless, dustless condition of the streets of that municipality and not feel that it is a desirable place in which to live.

The Sources of Dust

Before considering the effects of dust and the methods of alleviating the nuisance caused by its presence a study of the sources from which street dust arises may be of interest. A self evident source of dust is the mechanical abrasion by traffic of the road or street surface. It is manifest that the degree of abrasion will depend upon the amount and nature of the traffic, the kind of materials used, and the method of construction and maintenance employed. Other sources of street dust depending upon traffic are the deposition of dirt which has adhered to the wheels of vehicles coming from adjacent earth, gravel, or macadam streets, from the leakage of the contents of loaded vehicles both in transit and while loading and unloading, and from the excrement of animals. All street dust is by no means the result of traffic. In sections where shade trees are common a source of dust is to be found in the decay of twigs, bark, and leaves, while pollen, seeds, and spores of various plants are further sources. Mineral matter applied to certain street surfaces to prevent slipperiness is a constant source of dust. Dust resulting from manufacturing enterprises frequently forms a very considerable part of street dust. Mills where pulverizing is carried on, textile establishments and foundries are prolific sources of dust, while soot and fine ashes from chimneys find their way to the streets. From the nature of these sources it is apparent that the composition of street dust is extremely varied and complex.

Dust exerts a considerable pathogenic influence aside from its acting as a conveyor of disease germs. Various delicate membranes are irritated by the simple mechanical action of the dust, with the result not only of local inconvenience but many times of general debility. The membranes of the respiratory organs are susceptible to this influence, especially if a person be asthmatic. The membranes of the eye are also frequently seriously irritated by dust. In the sections where the dust problem has been successfully solved physicians report a marked falling off in the number of cases of conjunctivitis.

Methods of Prevention

In considering the problem of dust prevention on city streets it is advisable to classify the public ways under two general heads, business and residential streets, and to further differentiate between residential streets which are narrow, heavily shaded with trees and bordered with residences, and those streets which are more or less open.

There is one way and only one way to satisfactorily prevent dust on bituminous, cement-concrete, brick, wood block and stone block pavements which are subjected to excessive horse drawn vehicle traffic. That method consists in removing the dung of animals and other street refuse by hand sweeping during the day, mechanical sweeping of the streets at night, which should be preceded by sprinkling, and finally flushing with water to remove fine dust and thoroughly cleanse the surface of the pavement. Under certain conditions dependent upon the amount and character of traffic and the uses to which the street is subjected it is feasible to omit the mechanical sweeping. It must be realized that it is absolutely impossible to economically remove fine dust by either hand or mechanical sweeping. The use of the so-called dust palliatives and surface treatments on pavements subjected to heavy mixed traffic is entirely wrong in principle, as sanitary conditions require the constant removal of filth from streets, and if this is removed periodically by flushing the effectiveness of these processes is curtailed. Again, periodical watering of pavements to lay dust throughout the day is fundamentally wrong, as the fine dust which necessitates sprinkling should have been removed.

However, bituminous, cement-concrete, brick and wood block pavements may be used on streets subjected primarily to motor car traffic and light horse drawn vehicle traffic such as boulevards, open intra-urban trunk lines, etc. In many cases flushing is not necessarily a prerequisite to cleanliness. Generally patrol hand sweeping throughout the day will be sufficient.

Residential streets may be built with bituminous surfaces or as bituminous pavements, dependent upon local conditions. On this class of street the traffic is usually comparatively light from the standpoint of city traffic. If such streets have a surface coat of the proper kind of asphaltic material the dung of animals and other refuse can be removed by patrol hand sweeping, while the nature of the surface will be such as to absorb fine dust and render the street practically dustless.

For macadam streets in poor condition for superficial treatment or when financial conditions do not render expedient the use of surface treatments and patrol sweeping, recourse must be had to the use of palliatives such as light oils or light tars. To attain successful results it is necessary that light products having the proper chemical and physical properties should be used in small amount periodically during the season of dust.

In slum residential districts the streets, unless subjected to heavy horse drawn vehicle traffic, should, provided grades will permit, be constructed of water-bound macadam with a superficial coat of refined tar or as bituminous pavements with a seal coat of refined tar. The gradient, however, may require the use of an asphaltic-tar compound or an asphalt for the superficial or seal coat. These forms of construction will give a sanitary surface, one from which excess dirt, dung of animals and refuse can easily be removed by patrol hand sweeping, and which during the night can be thoroughly cleansed by flushing. It should be noted that the nightly flushing with water will add materially to the comfort of the people by perceptible cooling of the atmosphere during the hot summer nights.

In closing it is paramount to emphasize the fact that economical and efficient results will only be attained by municipal ownership of the requisite plant equipment and a well organized force of competent workmen.

Prices on Earthwork Overhaul

The practice of naming a flat urice on earthwork overhaul in drawing up contract forms is one which was introduced years ago a price being inserted which was then fair payment for that subdivision of the work, but in many cases to-day it is still adhered to, irrespective of changes in conditions, with the result that payment on this item is not on the same calculated, businesslike basis as the rest of the contract. This clause appears most frequently in railroad contract forms, a price of one cent per cubic yard for each one hundred feet of overhaul being specified. If this practice is analyzed and compared with the method of contracting for other items, it is readily seen that a revision should be made to afford adjustment for varying conditions. It the contractor is to submit a proposal with prices for the various units of work to be performed, he should name the prices on all items. If the engineer or owner fixes the price on the one item, overhaul, which is as much subject to variation as others, it would seem equally reasonable that he should fix the prices on all the work. Then a contractor could look over the list of prices and decide quickly whether or not he wished to look at the work on the ground and consider taking the contract. The prices named might alone cause him to go back home and give no more consideration to the work, This method might throttle competition in a way, for the only competitive bidding could be on the length of time needed to finish the job. Nearly every contract states that "time is the essence of the contract," and as time means money, much is saved to the owner by doing the work in a short period of time. If the prices are fixed, then the variable element would be entirely confined to the time of completion.

It is not usual in sub-letting work to name the prices to be paid. This is done either by setting a price for each class of work, or taking off a given percentage from the general contractors' prices. Subcontractors can then either reject the work or accept it.

To have live competition prices should not be set in the contract. Thus it follows that it is as much of a mistake to name a price for overhaul as it is for excavation or concrete.

A uniform price of one cent for overhaul to-day is entirtly out of proportion to costs. It is true that in bidding many contractors still name this price, but for team work especially, it is done through lack of careful consideration. In many cases this price will not cover the extra cost of overhaul by trains. But in the case of team work the inapplicability of this price shows up most strongly.

In most sections of the country, teams now bring a price of from five to six dollars per day. At six dollars a day of ten hours, the cost of a team is one cent per minute. A two horse work team will travel under ordinary conditions two hundred feet per minute. Thus a team consumes a minute to carry its load one hundred feet, and to return over the same distance in the empty. The time of dumping need not be considered. Thus with teams at one cent per minute, the cost of carrying a load one hundred feet is one cent. In wheel scraper work, the loaded scraper seldom carries more than a third of a cubic yard place measurement, so three trips are necessary to carry a cubic yard. This makes the cost three cents per cubic yard per hundred feet of haul. Even with teams as low as three dollars per day the cost is one and one-half cents.

If dump wagons are used the cost is less. A wagon rated as one and one-half cubic yards capacity carries only about one cubic yard place measurement. This makes a cost of one cent per cubic yard per hundred feet, but as wagons are not always loaded well, and time is lost in watering horses and in other ways, the cost is always in excess of this price. This shows the fallacy of a price of one cent being named.

A contractor should make a reasonable profit on every item of his work to enable him to make a balanced bid. It is only in exceptional cases that excavated material can be hauled a hundred feet for one cent per cubic yard. This low price is a relic of the times when a team and driver could be hired for $2.50 for ten to twelve hours. Most frequently it operates to the detriment of the contractor, but sometimes also a fixed price causes a loss to the owner. In either case it introduces an element which is not subject to individual computation and bidding, the uncertainty of which should be removed from the contract.—The Contractor.

The South River bridge, Nipissing Township, Ont., is of steel and concrete. It comprises one steel span 80 feet long, with two reinforced concrete approach spans 30 feet long, making the entire length 140 feet. The steel span is supported on concrete pedestals, which rest on a concrete base. On the southwest side the concrete base is supported on a pile foundation. The floor joists are supported by an 18 inch curtain wall between the pedestals. The shore ends of the concrete approaches are supported on light concrete abutments, with wing walls. The steel span was supplied and erected by the Hamilton Bridge Works Company for $1,677. Twisted steel bars were used for reinforcement in the concrete beams in the approaches and No. 6 expanded

New Medical Building, McGill University, Montreal

metal floor mesh was used in the floor reinforcement. The pile foundations were prepared under the supervision of D. H. McIntosh, Foreman Public Works, and James Leitch, C.E. The concrete work in the piers and approaches, and the laying of the concrete floor, were done under the supervision of S. W. Butt, Foreman of Public Works. The cost of the bridge complete was $5,498.

New Medical Building, McGill University

The new medical building at McGill University, Montreal, was formerly opened on June 5th by His Excellency, the Governor-General. The site on which the structure is erected was donated by Lord Strathcona, who also gave over half a million dollars for the construction and equipment of the new building.

New Medical Building—front view, south side

The architectural style of the new building is an adaptation of the English collegiate. It is the largest building of the University group, having a total frontage on Pine avenue and on the campus of 268 ft., 4 in. It is built of Montreal limestone and the construction is fireproof throughout. The roof is covered with green slate and copper flashings. The corridors of the building have dull glazed terra cotta walls and mosaic floors, with marble borders. The other floors are all of hardwood. The finish throughout is white quartered oak.

The entrances from the Campus and from University street are by broad flights of granite steps, through vestibules finished with grey sandstone, with vaulted terra cotta ceilings, to the staircase halls, the walls of which, as well as the corridors, are lined with low glazed terra cotta, to a height of 8 feet. Two separate staircases, finished with ornamental balustrades of wrought iron, with marble steps of ample width, lead to the upper floors.

The museum, facing on Pine avenue, is three storeys in height, and is entered from each floor of the main building. The open well for light in the centre is finished in low glazed terra cotta, surmounted by a leaded glass dome, with an outer dome of prism glass. The doors are of mosaic, with marble borders, and the cases for specimens are made of steel.

The building is heated by hot water from the university's own plant.

The architects for this building were Messrs. Brown & Vallance, the general contractor was Mr. E. G. M. Cape, and the following were sub-contractors: Mr. George Roberts, carpentering; and Mr. F. A. McKay, architectural iron work.

Dump car bodies were altered so as to be readily lifted from the trucks by derricks and dumped as skips, in the excavation of a part of the North Shore channel of the Sanitary District of Chicago. This was done to meet a condition where the settlement and flowing of the soft clay on the dump made it difficult to maintain dumping tracks near its edge. Travelling derricks, standing on the solid fill and advancing with it, lifted the car bodies by means of a gear of chains, with a spreader bar, engaging hookeyes at the ends and one side. The dumping door on that side was permanently fastened in the closed position, while the other retained its swinging arms. The hinged door was held by a line in the chain gear so that it swung open in the usual way when a trip line at the opposite closed side tipped the body toward it to dump. The car bodies were swung out beyond the solid fill, dumped and returned to their tracks.

The British Canadian Ship Building & Dock Company has been organized in London, Eng., with a capital of $10,000,000. Sir Henry Pellatt, of Toronto, is chairman. The company has secured a site of over 300 acres at Sydney, N.S., for new shipbuilding yards, docks and shops. The estimated cost of the plant which it is proposed to erect there is $6,000,000.

Notes on Reinforced Concrete Design

A Few Points Affecting the Engineer and Contractor—Reduction of Live Load Insufficient to Overcome Settlement of Footings—The Bending Moment*

By C. S. L. Hertzberg.

In designing reinforced concrete structures one is continually meeting minor problems, upon which very little satisfactory information can be obtained from the numerous treatises on the subject. In the following paper I shall endeavor to enumerate a few points in design which are sometimes apparently not given the attention they deserve.

Footings have probably given more trouble to the designer, the erecting contractor and the owner, than anything else in connection with reinforced concrete. Unequal settlement in footings is responsible for numerous unsightly deformities and cracks and some collapses.

The common type of reinforced concrete column footings is, of course, easily dealt with, and differs from a plain concrete footing only in its being designed as a flat slab to resist bending instead of being sloped off as a pedestal. In this type of footing the centre of pressure coincides with the centre of gravity of the footing area, and the required size is formed directly from the load to be carried and the resisting power per square foot of the soil. Trouble is sometimes caused by having a footing too large in comparison with the size of the other footings in the same building. This is particularly liable to happen in the design of wall column footings in the following manner:—

If the footings are designed to carry the total dead and live load, figuring each floor of the building fully loaded, then the interior footings will, under probable loading, not stress the soil as highly as will the wall column footings. The reason for this is, of course, that the load figured to come on the wall column footings is usually about 70 per cent. dead load (which is present under all conditions) and 30 per cent. live load (which is never all there), while that figured on the interior column footings is generally about 40 per cent. dead and 60 per cent. live. As the live load on the footings of a building of five storeys or more is never more than 50 per cent. of the total live load, it will readily be seen that the pressure per square foot is less on interior footings than on exterior ones.

As all soil is compressed under any loading, the interior footings will not settle as much as the exterior ones, and the result is sometimes the cracking of floor beams and slabs.

The difficulty is overcome, to a certain extent, by the custom of reducing the live load by about 50 per cent. in buildings of over a certain number of storeys. This, however, would appear to be insufficient, and it would seem that either a greater reduction should be figured in designing interior footings, or else no reduction at all should be allowed in figuring exterior column footings. It would also appear to be wise to even add a small percentage on corner column footings, as a much larger portion of the wall coming on these is dead weight.

It very often occurs that the footings under wall columns cannot be built to extend beyond the outside line of the column. In cases of this kind some sort of combination footing should be used. This is sometimes done by carrying the column in question on a cantilever beam, pinned down at the other end by one of the other columns. In this type care must be taken to reduce the footing under the second column in proportion to the upward thrust from the end of the cantilever beam.

A simpler method of treating the above is as follows:—

Consider the wall column in question and the nearest interior column as acting together on a combined footing. Figure the loads coming on both columns and find the position of their resultant load. Add the two loads and divide by the soil value per square foot. This will give the required footing area. Design a footing of this area and varying in width from one end to the other in such a way that the centre of gravity of the area will coincide with the point of application of resultant from the two column loads. The thickness of the footing and the reinforcing material must now be designed, treating the footing as an inverted beam, supported at the two columns and resisting the upward pressure of the soil, which will be of an intensity per square foot equal to the soil value, minus the weight per square foot of the concrete in the footing.

The above method can be used for designing combination footings for any number of columns.

Figure 1 shows a footing of this type designed to carry the four columns indicated, whose loads were (1) 267,000 lbs., (2) 347,000 lbs., (3) 248,000 lbs., (4) 197,000 lbs. The soil value assumed was 5,000 pounds per sq. ft. Column 1 was a corner column, 2 and 3 were wall columns, and 4 was an interior column. The footings could not extend beyond the lines a b and a c. The footing was designed as follows:—

Sum of column loads=1,095,000 lbs.

Sum of moments about side a b=10,272,166 foot pounds. Therefore centre of pressure is $\frac{10272166}{1095000} = 9$ ft. 4½ in. from a b.

Taking moments about line a c, we find centre of pressure is 7 ft. from a c.

This locates the point x, the centre of pressure.

Area of footing required $\frac{109500}{5000} = 219$ square ft.

The lengths 18 ft. 6 in. and 14 ft. of the sides a c and a b are now arbitrarily assumed.

Area of rectangle a b c d = 259 sq. ft.
Area of footing required = 219 sq. ft.

Area to be deducted = 40 sq. ft.
Deduct area e f g h 7x6 = 42 sq. ft.

Let x = distance from a c to centre of gravity of area to be deducted.

Let y = distance from a b.

$$\text{Then } x = \frac{259\times7-217\times7}{42} = 7 \text{ ft.}$$

$$\text{And } y = \frac{259\times9.25-217\times9.38}{42} = 8 \text{ ft. } 7 \text{ in.}$$

which locates the position of the area of e f g h, which will give a footing whose centre of gravity coincides with the centre of pressure x.

The footing was then designed for bending by treating it as four beams between the four columns, figuring on 5,000 pounds per square foot upward pressure, minus the weight of the concrete in the footing.

---

* Before the Canadian Cement and Concrete Association.

While the centre of pressure will, of course, shift under different conditions of column loading, still the variation cannot be sufficient to cause a serious settlement of any part of the footing.

In some cases it is very difficult to economically combine a wall column footing with any other footing. Where this is the case the footing is increased towards the inside of the building and along the wall. When this done the column must, of course, be tied in at the top and figured to resist the bending caused by the eccentric loading on the footing. This bending is generally increased by the bending moment from the eccentricity brought on the column from the floor loads.

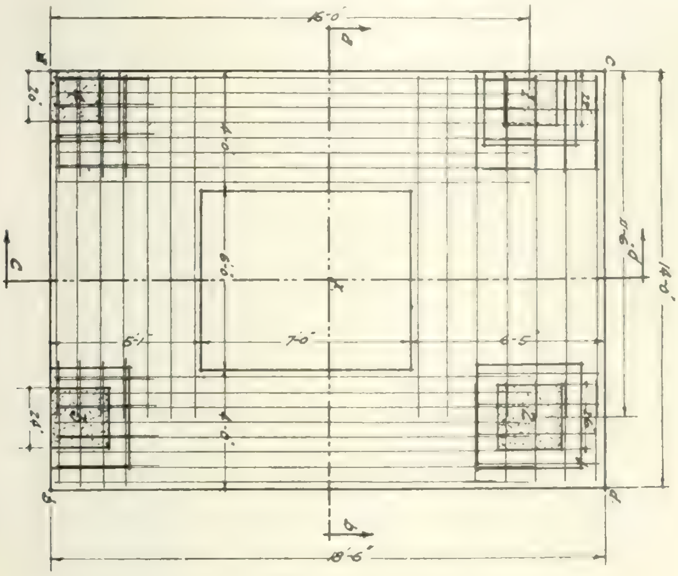


Fig. 1—Plan.

A point in designing reinforced concrete which is often overlooked is the bending produced in wall columns carrying long span beams. This moment seldom gives trouble in the lower tiers of columns in a building of any considerable height, as in such cases the columns are so heavily loaded that the eccentricity is not sufficient to produce actual tension in the outside of the column.

The common practice of designing wall columns 20 per cent. heavier than interior columns does not always overcome this tendency to crack from bending, as the extra strength is not applied in the proper place.

Consider the roof columns of a building of considerable width in which the roof beams span from side to side with no intermediate support. The usual custom is to carry the column reinforcement to within a few inches of the top of the roof slab, and to bend the anchor bars of the beams down into the columns the usual depth to prevent cracking in the upper surfaces of the beams near the ends. In a building designed in this way the result is pretty sure to be cracks across the outer surfaces of the columns immediately under the level of the bottoms of the beams, even though the roof be under no load other than the dead load of the structure itself. The reason for this is that the beam deflects under its own weight and the weight of slab carried. This deflection produces a tension in the upper surface of the beam at the end, which tension is also present at the outer surface of the column where it is altogether liable to produce large cracks. These cracks can be seen in many buildings. They could be prevented [illegible] by increasing the reinforcing steel in the outer side of the column. This reinforcement should not be stopped at the roof level, but should be bent in along the upper surface of the beam. The use of plain steel rods for reinforcement in these columns (if the same are not bent over as described) increases the liability to crack, owing to the fact that they must be embedded to a greater distance than deformed bars in order to develop their tensible strength. Cracks of this nature are, of course, more unsightly than they are dangerous, for beams supported in this manner are usually designed as non-continuous over the supports and should be of the required strength whether pinned down to the columns or not. However, the bond with the column is an added strength to the beam and should be preserved.

The placing of brackets under a beam of the above description does not overcome the difficulty, and is, in my mind, poor practice. The brackets tend to spread the columns by causing the beam to act as an arch whose thrust is not properly taken care of, and cracks will very likely occur on the outer surface of the columns under the brackets. This construction acts, to a great extent, like a roof truss without a tie rod.

Reverse bending should be given particular attention in the design of highway bridges where heavy moving loads have to be provided for. In short span culverts where a flat slab is used this reverse bending at the abutments, if not properly taken care of, may result in a failure which has all the appearance of a shear failure, and such it may be after a certain point, although it has probably started in tension cracks in the upper surface of the slab.

Consider a culvert, say 12 feet clear span, to be designed to carry a 15-ton road roller. The slab is designed as non-continuous, and enough steel is inserted in the bottom to give a resisting moment to properly take care of the total maximum bending moment liable to come on the culvert. In all probability the concrete itself will figure to take care of all the shear at 50 pounds per square inch, and therefore no extra provision is made against failure through shear.

At first glance this culvert would appear to be properly designed to insure against failure from any cause, for, as the slab is not figured continuous over supports, it does not seem necessary to put any steel in the top of the slab at the abutments. This conclusion would be safe if the slab were cast separate from the abutments, but if (as is nearly always the case) the abutments and slab are monolithic the following is liable to occur:—

A heavy vibratory load comes to the centre of the span and produces considerable deflection, and as the slab is tied down to the abutment, tension is produced in the upper surface of the slab and on the outer surface of the abutments. The slab, being thinner than the abutment, cracks on the top just inside the line of the abutment. Then as the load approaches this point the shear is increased and the cracked concrete is probably not capable of resisting this shear and collapses. This failure might have been prevented in three ways, namely, by the use of top steel, by the use of steel shear members, or by having a complete horizontal joint between the slab and abutment.

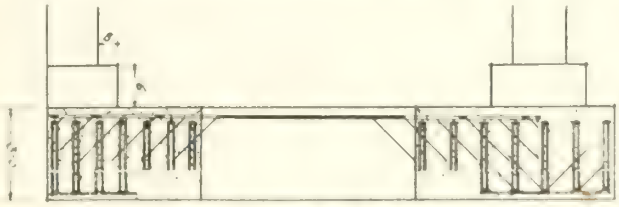


Fig. 2—Section on Line A-B.

The advantages of what is known as flat ceiling construction are many, the most desirable among them being the appearance produced and the economy in floor height. The chief disadvantage in the most common types is our lack of scientific data on the subject. In a well known type opinions differ nearly 100 per cent. as to the bending moment to be figured in slabs under the same loading. In the Engineering Record of 24th December, 1910, there is an account of some measurements made to obtain the strain existing in different portions of a flat slab floor under working loads. From these strains the existing stresses are figured. The results of these measurements appear to indicate that some designers are over-sanguine about the carrying capacities of this type of floor.

A more conservative design of flat ceilings is effected by increasing the width of the beams and decreasing their depth until the underside of the beam is flush with the underside of the slab. The slab in these cases is usually made up of small reinforced concrete joists, with tile fillers in between and two or three inches of concrete over the top to aid in compressive resistance.

In this type of floor the stresses are known and the strength can be figured along the same lines as the ordinary slab and beam construction. The tile fillers are placed as much as possible below the neutral axis of the slab, so as not to decrease the compressive resistance of the concrete, and of course they decrease the dead load of the floor. This type of floor is not as economical in steel as the usual slab and beam construction on account of the decreased arm of the resisting couple of the steel in tension and the concrete incompression.

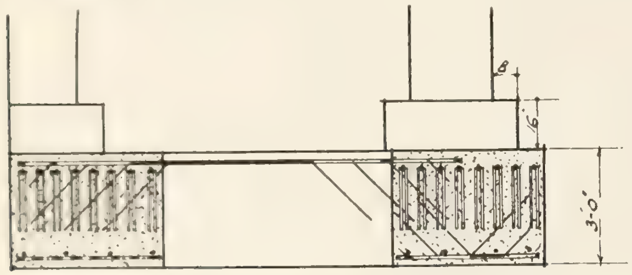


Fig. 3. Section on Line C-D.

Two-way reinforcement in a rectangular panel, designed according to the accepted theory of reductions in bending moments, effects economy in concrete only. If the bending moments each way be reduced in the usual manner of multiplying by $\frac{B_4}{A_4 \times B_4}$ for the shorter span and by $\frac{A_4}{A_4 + B_4}$ for the longer where A represents the shorter span and B the longer, the steel may be slightly reduced by placing less near the edges of the panel than near the centre. This reduction is, however, offset by the fact that, in using bar reinforcement the amount of resistance of the upper layer of steel is decreased by the decrease in the resisting arm of the forces. The saving in concrete is, of course, effected by figuring it to take its full working compression, in two directions at right angles to one another.

Before closing I would like to enter a plea for the standardization of unit stresses and formulae in reinforced concrete design throughout Canada. Some things, of course, cannot be standardized, but such points as ratio of the modulii of elasticity of steel and concrete, the allowable working compressive strength of concrete, both in bending and in direct compression, the limits of tee action, etc., might be definitely settled and adhered to by all designers. If it is safe in one city to design a continuous beam uniformly loaded to resist a bending moment of one-twelfth WL, then it is equally safe to do the same in the next city, despite the fact that the second city insists on it being designed for one-eighth WL. Other points might also be straightened out, such as whether a specification should insist on using 12 for the ratio of the modulus of elasticity of steel to that of concrete, when in another part it calls for a working stress of 350 pounds per square inch for the concrete in a column and 10,000 pounds for compressive steel embedded in the same column.

Pushing the G. T. P. Main Line

It is expected that great progress will be made this summer upon the construction of the G. T. P. main line through the mountains. Last summer operations were delayed owing to the shortage of both supplies and men on the eastern and western slopes. The closing of the Skeena river a month earlier than usual last fall shut supplies out on the Pacific side, and made the usual winter operations on such cuttings and tunnel work almost impossible. However, contractors made a special effort during the winter to get in supplies and succeeded in placing large deposits along the route, which can be drawn upon for summer work. An abundance of labor is available for work on the eastern side of the mountain and prospects are good for a fair number of laborers being obtained for summer operations on the Pacific side.

It is expected that before operations are held up by the arrival of winter the two ends on the line will be driven far into the mountains from both ends and will be brought so closely together that the following summer the gap will be spanned and the two ends joined, thus completing the western through line from Winnipeg to Prince Rupert.

Rails and Fishplates Required for South Australian Railways

Tenders will be received at the office of the South Australian Government's Supply and Tender Board, Adelaide, up to 3 p.m. on July 4, 1911, for the supply and delivery of: 5,565 tons steel rails, 80 lbs. per lineal yard; 820 tons steel rails, 50 lbs. per lineal yard; 188 tons steel fishplates, for 60-lb. rails; 51 tons fishplates, for 50-lb. rails; 97 tons steel fishplates, for 41-lb. rails.

The 80-lb. rails and the fishplates for 60-lb. and 41-lb. rails to be delivered upon trucks on wharf of Port Adelaide, the contractor paying the wharfage; the 50-lb. rails and fishplates for same to be delivered upon trucks on railway wharf at Port Pirie, the contractor paying the wharfage, 1s. per ton. Customs duty will be paid by the South Australian Government.

The Brush Electrical Engineering Company, whose Canadian agents are the Canada Ford Company, Montreal and Winnipeg, are now executing in the steam turbine department of their Loughborough works, orders for government, municipal, and electric companies' stations, including two sets of 1,200 kw. for the Admiralty, three of 1,200 kw. for Edinburgh, two of 3,000 kw. for the North Metropolitan Company, one for 2,000 kw. for the Birmingham and Midland Company, one of 1,000 kw. for Walthamstow, one of 650 kw., and another of 400 kw. for Luton, one of 450 kw. for Kettering, and one of 300 kw. for Banbury, in addition to many others for private industrial undertakings.

St. Boniface, Man., is establishing a new record this season for expenditure on municipal work. About $250,000 will be spent on bitulithic pavements, $200,000 on sewers and $75,000 on the waterworks. A large sum will also be spent on smaller contracts and improvements.

Montreal—The Commercial Metropolis

An Excellent Report:—Progress Satisfactory, Labor Troubles Nil, Contracts Plentiful, Numerous Large Building Projects Approved—The Work in Hand

Special to the Contract Record

Office of the Contract Record,
Montreal, June 17, 1911.

There seems to be no lull in the activity in connection with real estate and building operations in Montreal and vicinity. Rapid progress is being made on all the buildings under way, no labor difficulties having developed up to the time of writing.

Montreal High School to Build

One of the most interesting features of the last few days was the sale of the Montreal high school and the purchase by the school commission of a property on which they will erect a new building to replace the one now occupied by them on Peel street. The purchaser of the present building was Mr. J. C. McGreevy, of Winnipeg. The area is about 95,000 square feet and the price paid, $1,500,000. The new school property is on University street, between Sherbrooke and Milton streets, adjoining the Diocesan Theological College. It is the intention of the commissioners to make a thorough inquiry into the best methods of school construction and as soon as arrangements can be made to erect one of the best planned and equipped high schools in the Dominion. It is not known what the purchaser of the old high school property intends to do with it. It is situated just north of St. Catharine street and in rear of the stores of John Murphy & Company and other prominent merchants. There is a suspicion in the minds of business men that eventually this whole block will come under the control or ownership of a single person or corporation and will probably be the site of a great departmental store.

Another deal that indicates a vision of the future and faith in the commercial metropolis of the Dominion is the sale of Knox Church on Dorchester in rear of Y. M. C. A. About a year ago the Sun Life Assurance Company of Canada purchased the Y. M. C. A. property and now they have purchased the church property to prevent, as they say, its purchase by speculators who might use it for some purpose that would detract from the value of the handsome building which the company intends to erect facing on Dominion Square. The price paid for the church was $150,000. The area of the land is 150 by 80 ft.

Theatre Projects

The increase in the number of theatres in the city of Montreal within recent years has been almost phenomenal, and still there are others projected. A week or two ago the announcement was made that the Sparrow Amusement Company had secured possession of a site on St. Catharine street near the Theatre Francais on which would be constructed a theatre with a seating capacity of 2,100 people. It is announced that this place of amusement will be open for business in October. The latest theatre project, however, is the erection of a new fireproof building at the corner of St. Catherine and Maisonneuve streets. The proprietor is Alderman J. A. E. Gauvin. This theatre will hold 1,250 people. The property will have a frontage of 85 feet on St. Catherine street and 126 feet on Maisonneuve street. It will be constructed of brick and stone with concrete foundations and fireproof [illegible] in the interior. In addition to the entrance on St. Catherine street, which will be large and attractive, there will be three stores. Over the stores will be a number of offices. The portion of the building will be five storeys high. The top storeys will be available for light manufacturing. The entire cost of the building is estimated at $155,000. Mr. C. Bernier is the architect. The contract has not yet been let. Several old stores were demolished and removed to make room for this splendid new structure.

Another example of improvement is seen at the corner of Craig and St. Alexander streets where a splendid property which for the past forty or fifty years, has been used as a wood-yard, is about to become the site of the new "Herald" building. Excavation work was commenced a few days ago by the contractors, the Bishop Construction Company, Limited, of Montreal and Toronto. The property has a frontage of 80 feet on Craig street and 148 on St. Alexander street. It will be seven storeys high and thoroughly fireproof. Reinforced concrete will enter largely into the construction with brick backing. The front of the building will be faced with first quality brick with ornamental iron and terra cotta trimmings. There will be an unusually large amount of window space on all sides of the building and the ornamental panels between the windows of the different floors will be of cast iron. The partitions will be of concrete on expanded metal. The windows will all be constructed with metal sash. The sides of the elevator walls will be of wired glass. The stairways will be of reinforced concrete with slate treads. The roof will be tar and gravel. The architects are Messrs. Brown & Vallance.

Building Inspector Chausse to Have Adequate Assistance

At last it looks as if Mr. Alcide Chausse is to have a reasonable amount of assistance in the performance of his duties as building inspector. The announcement is made that an examination will be held at the city hall on June 20th for the purpose of finding a suitable assistant head for this department. Several applications have been received and the appointment cannot come too soon. It is sincerely hoped that a really competent man will be selected and that this will be only the first of a number of appointments that will be made to bring the building inspection department up to a reasonable state of efficiency. The department has always been under-staffed, so that no matter how good or efficient, or diligent the inspectors might be they could never keep up with their work. Still there has been no public criticism on this point, but the complaint on all sides has been that there were not inspectors enough to maintain a proper oversight of the rapidly expanding operations throughout the city.

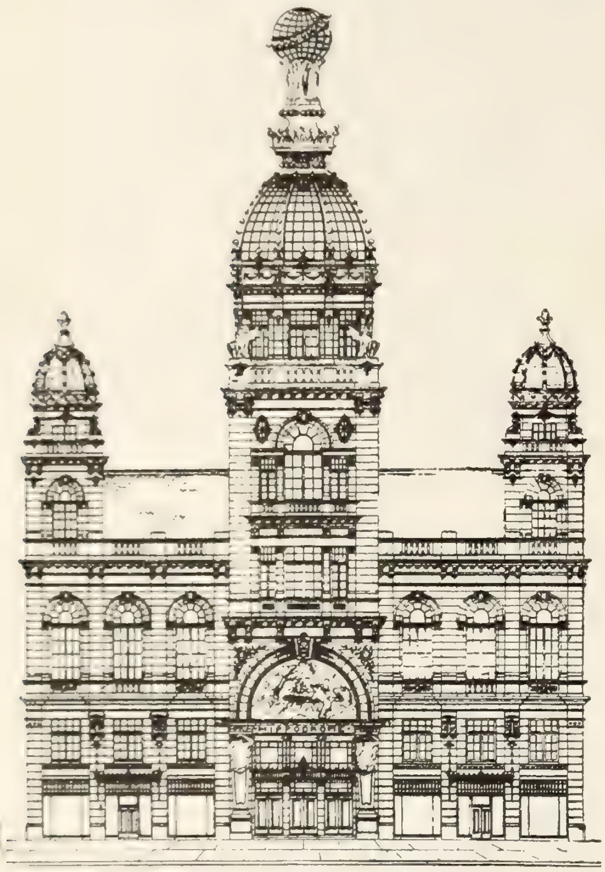
Following up a campaign recently carried on in the local newspapers, on the subject of fire estapes, Mr. Chausse has sent out a large number of notices to factory proprietors and others, ordering them to construct approved fire escapes on their buildings and that in a manner that will be of practical use when they are in place. The complaint of the chief of the fire department recently was that a large number of fire escapes were not easily accessible from the upper windows and in other cases the bottoms of the ladders were in lanes or back yards surrounded by other buildings or fences or blocked up by other means. Mr. Chaussee has been paying special attention to these conditions and recently sent out 25 notices in one day asking people to remedy certain defects in their apparatus. In a few cases where notices were received ordering the erection of fire escapes the parties notified wrote to the building inspector saying that they had ordered fire escapes, but the factories although overworked were unable to turn out the apparatus fast enough.

The school trustees of Outremont recently purchased 60,000 square feet of land on Lajoie street for school purposes. A large up-to-date school will be erected in this locality as soon as the necessary arrangements can be made.

The Long Pointe Board of School Commissioners are having plans prepared for the erection of two schools in that ward. One will cost $20,000 and the other, which will be a three-storey fireproof structure, will cost $40,000.

Proposed Montreal Hippodrome

Good progress is reported in connection with the proposition to erect in Montreal an immense hippodrome for the accommodation of amusement companies that hitherto have been unable to perform in Montreal except in tents. This structure is being erected at the corner of St. Catherine street and Papineau avenue by the Montreal Hippodrome Company, Limited. Messrs. H. H. Brosseau & Company, real estate brokers, are the promoters. The building is to be ready for opening in February next.



Front Elevation Montreal Hippodrome

The plans are being prepared by Mr. Theo. Daoust, architect, St. James street. The St. Catherine street frontage is 150 feet and that on Papineau avenue, 300 feet. Over the main entrance will be a tower surmounted by a dome that will reach the total height of 250 feet from the sidewalk. It will be 40 feet wide at its base, while the main vestibule will be 36 by 38 feet. The globe surmounting all will be supported by four magnificent statues of Atlas, each 18 feet high, and will be illuminated with powerful lights.

The ground floor of the plan shows two stores in the front, one on each side of the main entrance. The main hall will have a seating capacity of 6,500, two and one-half times larger than any theatre at present in Montreal, and around the seated portion of the auditorium will be a promenade 18 feet wide and 300 feet long which will provide room for 3,500 more, making ten thousand people in all who will be able to witness the largest performances. The stage will be 150 feet wide by 116 feet deep. It will have a moveable floor which can be instantly removed and under which there will be a tank of water 44 feet by 80 feet and 14 feet deep. The proscenium opening will be 44 feet by 80 feet. The tower will be constructed to serve numerous useful purposes. On the second floor will be a room known as the "surprise" room. It will contain the latest electrical appliances and the walls will be beautified by various examples of the decorator's art. The third floor of the tower will be reserved for the board of directors and the fourth for the shareholders. On the fifth floor will be a fashionable restaurant furnished in the style of Louis XVI. This room will be 180 feet above the level of the street. From the windows and the galleries surrounding it a magnificent view of the St. Lawrence and the city of Montreal will be obtained. This room will be surmounted by the main dome which will be constructed largely of glass and will be brilliantly illuminated with myriads of electric lights. Two elevators will convey patrons to these places of interest.

The material used principally in the construction of this immense auditorium will be Kittning yellow brick with sandstone trimmings. The windows will have metal sashes. The stairs will be of iron, with marble treads and bronze handrails and balustrades. The floors will be in mosaic with marble base and dadoes. Notwithstanding that the building is practically fireproof it will be supplied with fire escapes on three sides. Tenders will be called for shortly.

Dominion Express and Other Big Buildings Under Way

Excellent progress is being made on the new Dominion Express building and the transportation building siutated on the northwest and southeast corners of St. James and St. Francois Xavier streets. Cement floors have been put in for several storeys in the Dominion Express building and at the time of writing the stone work on Fortification Lane and St. Francois Xavier street is nearly up to the St. James street level. The first section of steel work has nearly all been placed in the transportation building. Reinforced concrete foundations form the bases of these iron columns and it is expected that this huge metal skeleton will grow up very rapidly to the ten storey height which it is planned to reach. On the opposite corner the work of demolishing the front of the general post office has been commenced. A side entrance is being constructed on the St. Francois Xavier street side which will enable the public to reach the receiving and mailing wickets without too much inconvenience. The plans for the new structure have been prepared by Mr. Theo. Daoust, architect, and show a fireproof structure with quite an altered and improved front. The general contractor is Mr. Joseph Bourke.

The steel work of the annex to the General Hospital is now practically all in place and good progress is being made with the stone, brick and concrete construction in the lower storeys. The corner stone was laid on June 5th when His Excellency, the Governor-General, officiated, and a large number of prominent citizens were present to witness the interesting ceremony which took place on the ninetieth anniversary of the establishment of the institution.

The walls of the new Central Y. M. C. A. building on Drummond street are now about half way up and the proportions of the building begin to be apparent to the passer-by. Good progress is also being made with the Westmount and Annex branches.

The excavation work for the new East End Post Office at the corner of St. Catherine and Plessis streets is now nearly completed and it is expected that good progress will be made in connection with the superstructure from now on.

The Montreal Terra Cotta Lumber Company has commenced operations in connection with the establishment of an extensive up-to-date terra cotta plant at Lakeside, a few miles west of Montreal on the property known as the Goldstein farm. This farm consists of 46 acres and was purchased last November by Senator Desjardins, president of the company. The property runs back for the greater part of a mile from a bluff some 60 feet high which fronts on the C. P. R. line. The clay formation goes to a depth of some 40 feet below the level of the railway track, making the depth of clay probably 100 feet throughout the entire area of the farm, which, it is estimated, will give the company as much material as they will be able to work up in the next fifty years. The C. P. R. is building a siding from its main line to the site of the terra cotta yard. Tenders are being called for the kilns, and the plans for the dryers are nearly ready. The most up-to-date machinery on the market is being purchased for delivery whenever the machinery buildings shall have been completed. It is estimated that the total cost of the plant will be in the vicinity of $150,000. The intention is to have it ready for operation this fall, but little work will be done apart from testing the machinery, etc., until next spring. The company's property in Maisonneuve will be sold and their operations concentrated at the Lakeside property. The capacity of the plant will be from twelve to fifteen cars a day. Crude oil will be used for firing or kiln burning and the machinery will be run by electric power supplied by the Montreal Light, Heat & Power Company. Seventy-five men will be employed. As terra cotta is entering more and more into fireproof building construction every year its importance can scarcely be over-estimated and the move made by this company in securing the property for their new plant must be regarded as a very wise one.

Chalet Apartments, Montreal

The Chalet apartments, which are being erected at the corner of Prince Arthur street and Oxenden avenue, Montreal, represent the most advanced type of modern fireproof, soundproof, and damp-proof construction. The building will contain 26 residential suites. It will be four storeys in height besides the basement. Each floor is arranged in six apartments of seven rooms each. The building has a frontage on Prince Arthur street of 76½ feet and on Oxenden avenue of 106 feet. The facing will be of red brick with handsome trimmings in rustic effects. The main entrance will be spacious and artistic, the various departments will be provided with heavy, roomy, balconies of solid oak which will enable the tenants to enjoy the outside air whenever the weather is favorable. The architectural design is of the Swiss Chalet character and the entire construction is to be carried out in reinforced concrete.

The Chalet apartments will be absolutely fireproof. Messrs. R. P. & H. A. Adams, the architects and proprietors, having decided to admit of no fire risks in the construction of this building. There will be no wooden studing throughout the entire structure. All the partitions will be of metal, cement and terra cotta. Those between the various apartments are being constructed of four-inch hollow terra cotta blocks, giving insulation from sound as well as being fireproof. The partitions between the various rooms of the same suite will be constructed of Kahn Hy-rib metal sheeting, plastered with Portland cement mortar to a thickness of two inches. No wooden laths will be employed. All outside walls are lined with hollow partition blocks, making the driest and warmest wall possible. The basement walls are thoroughly damp-proof. The stairways will be of iron with marble treads.

The floors are constructed according to the Kahn three-tile system in which hollow partition tile are used in conjunction with reinforced concrete to form a cellhlar floor, mostly air spaces, in this case ten inches thick. This arrangement gives a very stiff floor, incombustible and impervious to sound; it also obviates the necessity for beams projecting below the ceiling. The floors will be finished in hardwood laid on cinder concrete over the fireproof surface already described. As there can be no circulation of air from the under side, this wood could only burn slowly, if at all. The reinforced concrete columns supporting this structure have been made strong enough and are arranged to carry two additional storeys when required.

The structural design and the reinforcing steel hy-rib sheeting and terra cotta partition tile were furnished by Mr. G. B. Reynolds, engineer and sales agent in Montreal for the Trussed Concrete Steel Company.

The general contractors for this structure are Messrs. Byers and Anglin. They commenced tearing down the old building on the site on May 10th and have made splendid progress during the first month. There is every prospect of their finishing the building in the fall, the intention being to have the apartments ready for occupancy by the beginning of the new year. The cost is estimated at $150,000. The electric wiring is being done by Mr. W. J. O'Leary, and the plumbing and heating by Messrs. Hickey & Aubut.

The "Coronation" building is the name chosen for a new four-storey structure to be erected at the corner of St. Catherine street west and Bishop street for Mrs. D. E. Borrie. The property has 74 feet frontage on St. Catherine street and 110 feet on Bishop street. The ground floor will be occupied by six stores. The total height of the building will be 60 feet. The base will be of Montreal limestone, while above the first floor art stone will be used with ornamental iron facades. The store entrances will be very attractive. In addition to the features already mentioned the plans show accommodation for fifty offices in the block. The architects are Messrs. McDowell & Henderson, of Guy street; the general contractor is Mr. G. W. T. Nicholson, Eastern Townships Bank Building; and the sub-contractors Messrs. D. M. Long, carpenter work; R. D. Clark & Sons, plastering; D. A. Bethune, heating and plumbing; John Wilson, painting; Phoenix Bridge Company, iron work. The Calkins Tile & Mosaic Company will supply the tile and marble. The foundation will be of concrete on piling. The total cost is estimated at between $70,000 and $75,000.

The contractors are just putting the finishing touches on a French Methodist Church at the corner of Ontario and St. Andre streets. The structure is in red brick and will cost between $15,000 and $20,000. A feature of the building, which is somewhat in the nature of an experiment, is the flooring of "Terrano." This is believed to be one of the first instances of the use of this material in a church, or similar public building. The architects were Messrs. Peden & McLaren, and the contractors Messrs. Peel & Peel, masonry; D. V. Smith, carpentering; J. A. Alexander, painting and glazing; John Date, plumbing and heating; Metal Shingle & Siding Company, roofing; E. A. Gregory, electric lighting.

Our Chicago contemporary, Engineering-Contracting, has decided to substitute the conjunction "and" for the hyphen. In future, therefore, it will be known as Engineering and Contracting. The reason for the change is that the hyphenated name has been understood by quite a few people to mean only contracting for engineering works, whereas it was intended to denote the co-ordinate branches of engineering and contracting.

Winnipeg—The Hub of Western Activity

City Building Code and Public Health Act at Variance—All Branches of Trade Busy—Progress on Larger Contracts—Crop Prospects

Special to the Contract Record

Winnipeg, June 16, 1911.

Winnipeg's building trades had something of a shock a little less than a month ago when it was discovered that there was considerable variance between the city building by-laws and the new Public Health Act passed by the provincial government at the last session of the house. In this act provision was made to prevent the too great crowding which is recognized as one of the objectionable features of city life. It has been the practice to build apartment blocks and tenement houses to cover the whole of the lot, and the civic authorities were the first to recognize the growing danger. They drafted a by-law which specifies upon what percentage of the lot the owner may erect such buildings.

This spring the Manitoba Government also took this matter up, among others when they were drafting a new Public Health Act. Recognizing that proper sanitation and supply of pure air were impossible where congestion of buildings existed they inserted a similar clause, but with a greater percentage of clear space.

This spring plans were made for the erection of a large number of apartment blocks and architects proceeded along the line of the city bylaw. Later it was discovered that their plans did not agree with the provincial act and for a time there was consternation, as something over a million dollars' worth of buildings were involved. To make these comply with the Act would have involved the redrawing of all plans and considerable delay in starting work. The government was approached with the result that it has been decided that the Act will not come into force until July 1, this permitting the plans already completed to be filed and passed upon by the building inspector.

Another view of the Transcontinental Railway Bridge across the Red River

Unskilled Labor in Demand

There is a great rush in building circles at present and all classes of artisans are well employed, while unskilled labor is in great demand. The contractors who laid down their foundations last fall are making excellent progress but the heavy rainfall of the last three weeks has greatly hampered excavation work, for Winnipeg dirt when it is wet, is the worst in Canada to handle. Supplies of material are coming in rapidly and there has been no trouble from this cause, nor is there likely to be any.

Progress on Larger Work

The greater portion of the work on the new Transcontinental Railway bridge across the Red River at Winnipeg has been completed. The main steel has all been placed and little remains now except the installation of the lifting machinery and the weighting of the counterpoise. The steel gang is pushing the viaduct south to connect with a second gang which is building northward from the Union depot. A strike and the non-arrival of steel are stated as the causes of the tie-up on the bridge across the Assinaboine. The blocking of navigation at this point by the sections already installed will be brought to the attention of the railway commission.

Delivery of steel has begun at the Sterling Bank building on Portage avenue and it is expected that this structure will shortly be above the street level. The foundations have not been completed and because of the delays the contractors have been put to considerable expense in shoring the excavation. The steel delivered is second in size only to that placed in the Bank of Montreal building, and the plans call for a structure of truly magnificent proportions.

The Bank of Montreal on the Main-Portage corner is getting along rapidly. One of the huge pillars has been carried up to the cornice level on the front, so that it is now possible to get something of an idea of what the finished structure will be. At the same time interior work is being rushed with all possible speed. The stonework of this building is the most massive yet attempted in Winnipeg, the granite blocks for the bases of the pillars weighing 18 tons apiece, necessitating great care in the placing.

The contractors for the addition are now testing the foundations of the Somerset Block. A load of 180 tons of pig iron is being applied to some of the pillars. If they sustain this weight without undue deflection construction will be proceeded with at once. The piling for the foundations of the new Y. M. C. A. building is practically completed, and the masons will be at that job within a few days The plans for the new Free Press building will be completed in a few days and contracts will be called for at once. At the Bank of Commerce building the foundations have been completed and the steel for the first floor is in position. These foundations are among the heaviest yet attempted in the city for the structure will be a most massive one with solid stone front and heavy interior construction.

Transcona Shops To Cost $6,000,000

The new shops at Transcona, near Winnipeg, for which tenders are being called by the commissioners of the Transcontinental railway comprise eleven buildings in addition to the indirect heating plant, the yard crane runway and the sewer system. The eleven buildings include lumber sheds, scrap platform and storage bins, freight car shop, planing mill, paint storehouse, coach paint shop, coach shops east and west, car department office, and motive power office. Contractors are asked to tender on these additions in bulk.

It is expected that the cost of these new buildings with their equipment, will run close to $2,500,000, which will bring the cost of all the structures to over six million dollars.

The details of the shop plant were developed, and the actual construction is being carried out under the supervision of Frank W. Walker, M. E., superintendent of terminal shops for the Transcontinental Railway.

Hundreds of Houses Going Up

In the outer residential districts there is a great rush in construction and it is not over-estimating to say that there are several hundred houses on the way. Many of these are outside the city limits but the municipalities are making preparations to install local improvements so that the tenants will not suffer from the handicap of lack of water, sewers, light, roads and sidewalks. It is highly probable that several of these surburban districts will be taken into the city in the near future.

Hydro-Electric Development

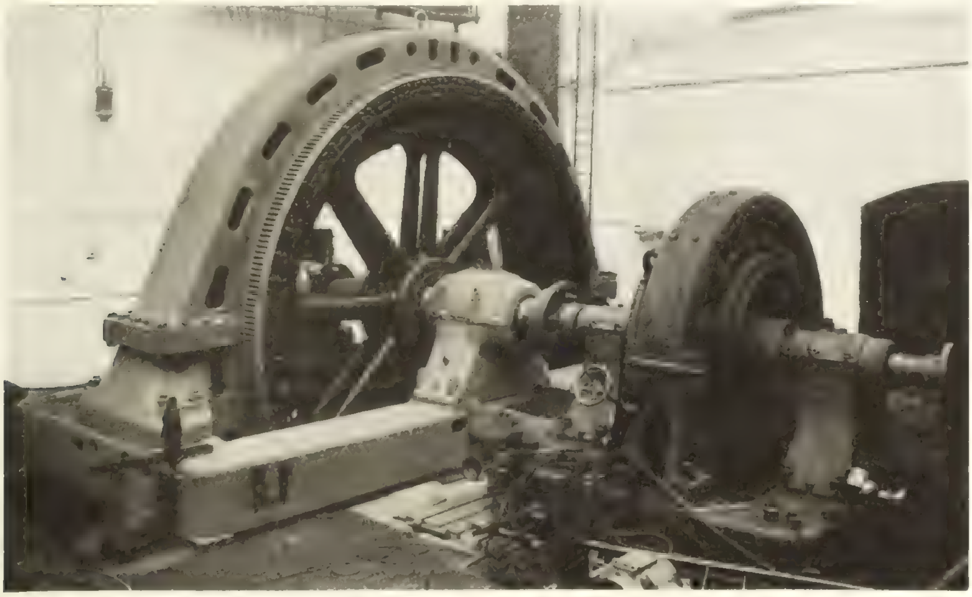
Down town the civic hydro-electric power department are making rapid progress in laying down their distributing system. Conduits are now being put down on McDermot avenue connecting with the King street distributing station, and the Portage avenue conduits will be the next undertaken. There is a delay at the plant due to the decision of the engineers to strengthen some of the dams and retaining walls, but in the meantime the installation of turbines, generators and transformers is progressing rapidly. Officials are chary of expressing any idea as to when it will be possible to place the plant in commission, but the general impression is that December will see it in full swing

A Great Crop in Prospect

Crop conditions and prospects have had a great deal to do with the present building situation, for with the vanishing of fears of early drought has come the desire to rush to completion many of the buildings planned last winter. Conservative estimates place this year's crop at 200,000,000 bushels of wheat with even average weather from now until harvest. Soaking rains have occurred, with the result that the crop can now go well into July without further moisture. The grain has a splendid stand and is deep rooted with a vigorous growth. The Red River valley country has suffered somewhat from excessive rain, but this will hardly affect the grand total of production. It is one of the most promising seasons which the West has had in many a long year, and the only dangers now to be avoided are burning winds and rust.

In view of this prospect the railway companies are now at work making preparations to market the grain, which will call for a considerable addition to their rolling stock and motive power. This year the movement will be greatly expedited by the advance in railway work. The G. T. P. will have its line from Winnipeg to Fort William in good operating form, and the C. P. R. double track to Brandon will be ready to relieve the congestion there. The north line through Yorkton will also handle a larger proportion of the yield from that district. The banks are also starting their plans for the financing of the movement, but this feature never causes any worry in the Canadian grain-growing districts.

L.H.S.



Winnipeg Hydro-Electric Plant.—One of the big generators in position on the testing bed at the works of Messrs. Vickers, Sons & Maxim, Sheffield, England

Mr. McGillivray, Good Roads Commissioner for Manitoba, returned recently after a visit to Minneapolis, Chicago and Port Arthur, Ont., undertaken for the purpose of inspecting various classes of paving material

A New Type Grab Bucket for Excavating, Dredging and Unloading Plants

The large amount of dredging for rivers and harbors and the extensive excavations involved in modern construction, as well as the large quantities of bulk material handled nowadays have called for and brought into use a great variety of digging and carrying buckets. Hitherto it has been considered that the clam-shell and the orange-peel types of bucket were the most suitable for this work. Lately a device has been invented by H. P. Andresen that comes under the nomenclature of the "grab" bucket. In principle of operation as well as in construction it is different from other buckets. It is generally admitted that the best style of bucket should have powerful digging action, positive opening power, be light in weight, simple in construction and easy to operate. These qualities and more are claimed for the Andresen-Evans grab bucket. For dredging and excavating and handling bulk material, such as ore, coal, sand, stone, etc., this bucket has demonstrated its superiority from an operating standpoint for the following reasons:

Where Andresen-Evans Grabs are built for the Canadian Market.

First, the path of travel of cutting edges and the inclination of trays are such as to cause the scoops to dig into and not out of the material.

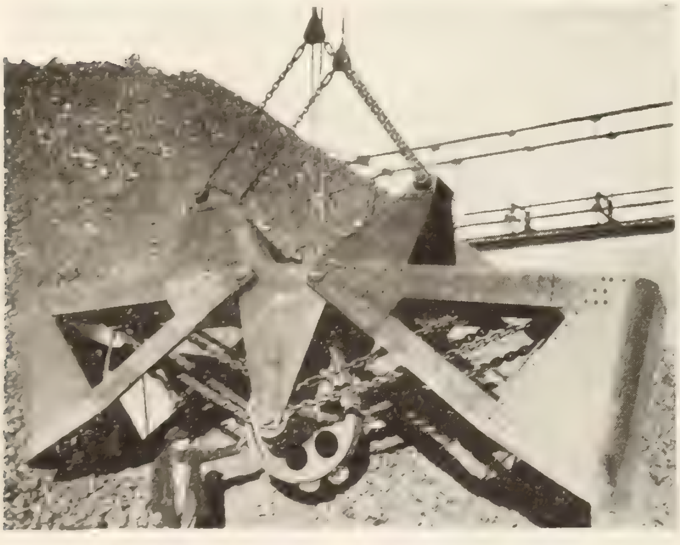
Second,—Direction of pull of the closing chains draws the scoops down into the material.

Third,—Wide opening, 50 per cent. greater than Clam Shells. This means that actions set forth in 1st and 2nd take place over a stroke one-half longer, and therefore, the Grab is a better filler; the wide opening is of especial advantage in unloading boats, barges or cars, reducing hand shoveling to a minimum and getting loads where Clam Shells would not.

From a constructive point of view it will be noticed that it is not a blacksmith's job with a lot of forging, pins, etc., but is built of structural shapes and plates solidly riveted together and braced in all planes, consequently keeping in alignment no matter how severe the service conditions. The cost of maintenance, therefore, is also very low. The drum is of cast steel and the few bearings required all have long, phospher-bronze bushings.

This grab bucket consists of a central frame and two braced scoops. The lower part of the central frame carries the differential drum which is so placed that the closing chains give a downward pull with a large leverage through the stroke. At its upper corners long bearings, for the shafts upon which the scoops swing, are placed. These shafts are separated by a considerable distance so that the already wide opening is greatly increased. This separation of the pivots has the effect of giving a long, strong, cutting motion which has been aimed at by all inventors and manufacturers of excavating machinery. The action of the two scoops is not unlike the action of two dippers of a dipper dredge. The back of the scoop is usually left open; so, when they come together there is no pressure tending to pack the contents or to break friable material, such as coal. The wide opening is especially desirable in cleaning up boats or barges. In some cases the cost of labor for cleaning up has been reduced by one-half.

The removal of quicksand from under water has heretofore proven very difficult when orange-peel and clam-shell buckets have been employed; consequently such material has been most successfully handled in the past by very expensive hydraulic or dipper dredges. The Andresen-Evans grab bucket has clearly proved its ability to handle such material in the most satisfactory manner. This grab has demonstrated that it will handle more material, in proportion to the weight of the bucket, than any other make. The bucket is not dependent upon its weight to dig; consequently it need not be dropped upon a pile in order to get initial penetration as is required with most buckets when digging in difficult material. The dropping of heavy buckets into most kinds of material results in both wear and break-


The Andresen-Evans 4-line grab bucket—8 cubic yard type "A."

The Andresen-Evans grab bucket in operation.

ages which are practically eliminated in the case of this bucket.

The bucket is made in sizes varying in capacity from one to eight cubic yards. It is built for two, three or four line operation. The large size bucket shown in the illustration is an eight cubic yard grab having the great reach of 22 feet between the cutting edges. These buckets can be operated in connection with any of the double drum hoisting plants commonly used by contractors or as used on ore and coal handling docks.

On a recent test in unloading a large lake steamer of West Virginia splint coal, which is the most difficult coal to dig that is mined, the grab bucket averaged 62 per cent. more coal per trip when taking out the material from directly under the hatch and 71 per cent. more per trip when cleaning up, than a well-known clam-shell bucket of the same rated capacity. One of the largest dredging and sand handling concerns in Canada purchased one of these grabs last summer, which did so much better work than other types being used that they have since placed an order with Mr. Andresen for five additional buckets.

The Andresen-Evans type "A" grab bucket loaded and closed.

At one plant of a large steel company a four-cubic yard Andresen-Evans grab is handling more material than two three-cubic yard buckets of another make.

Although this grab bucket has been on the market only a little over two years, it is now in service at numerous places from Port Arthur, Ont., in the north to Galveston, Tex., in the south, Baltimore in the east to reclamation work in New Mexico in the west. It is in use in five plants of the United States Steel corporation; is used by the United States government and has been ordered recently by the Canadian government. It is the new principle of operation that has earned the above record.

It is being sold for the Canadian market by H. P. Andresen, Liverpool and London and Globe Building, Montreal, and in the United States by the Andresen-Evans Company, Chicago, Ill.

Personal News and Notes

Mr. J. M. Nelson, for 34 years assistant engineer to the Montreal Harbor Commissioners, has resigned.

Out of a total of $516,000 of paving work at Montreal, for which tenders were called, the city bid successfully for work aggregating in value $120,000.

The bricklayers of Calgary, Alta., have turned down an offer of the masters of 66¼ cents an hour. It is said to be their intention to hold out for 70 cents.

From Hull, Que., comes the rumor of a new cement company comprised of local men and capitalized at $50,000. Property is stated to have been secured just outside the city limits.

The municipalities of St. Johns and Iberville, Que., have effected an arrangement for the erection of a reinforced concrete bridge across the Chambly canal. The cost of the undertaking is placed at $154,000.

The Fraser Valley Tile & Cement Company have purchased an extensive site at Sapperton, where they will at once commence the erection of a large cement plant, the machinery for which has already been ordered.

The John Galt Engineering Company, of Winnipeg and Toronto, have been appointed consulting engineers on the new sewer system at Cranbrook, B. C. The estimated cost of the undertaking is in the neighborhood of $100,000.

The city council of Victoria, B. C., have appointed Mr. Wynn Meredith consulting engineer in charge of the Sooke Lake scheme of water supply. Mr. Meredith will receive $1,000 a month and will furnish a competent field engineer.

At a meeting of the Master Plumbers' Association at Fort William last week, the name of the organization was changed to the Canadian Society of Sanitary Heating Engineers. The next year's convention will probably be held in Montreal.

W. S. Harvey, A.M.I.C.E., A.M.I.M.E., of of the Engineering Staff of the Main Drainage Works, Toronto, was married at St. Paul's, Lachine, P. Q., on Tuesday, June 6th, to Miss Lina Vivian, third daughter of George Haddock, Esq., Hull, England.

Ex-City Engineer Antonisen, of Port Arthur, was presented by his staff with an illuminated address and a diamond tie pin, upon his retirement. The presentation was made by Mr. Antonisen's former assistant, Mr. Jones, who has now succeeded to the post of City Engineer.

The substructure of the new Cambie Street bridge at Vancouver (described in detail in our last issue) is about completed and the resident engineer, Mr. C. P. Moss, expects to see the whole work finished by August. Operations have been delayed considerably by the strike.

A Seattle contractor, Mr. Matthew Dow, was last week awarded the contract for a $300,000 concrete wharf and warehouse for the Grand Trunk Pacific Railway at Vancouver. It is probable that Mr. Dow will also receive the contract for an office and store building for the same company.

The Canadian Mineral Rubber Company are making enterprising arrangements for carrying out their contract for 36 miles of paving at Victoria, B. C. They expect to put 600 men on their pay roll at Victoria with a wage disbursement of at least $3,000 a day. They hope to finish the work within one year.

One of the busiest firms in the Queen City at the present time is R. Robertson & Sons, Limited, masonry contractors. They are making excellent progress on the museum for the University of Toronto, and also on the power house for the central heating plant of the same institution. At present they are just completing the pathological building for the Toronto General Hospital. Among their most recent successes may be mentioned the Servants' Home at the Toronto General Hospital (architects, Darling & Pearson), and a 6-storey warehouse for M. Rawlinson (architects, Wickson & Gregg).

It is stated that a company capitalized at half a million dollars is about to locate at Hull, Que., to manufacture a mine tester, a new invention of Mr. Chas. Demerais, of Hull. Work is to be started soon upon the erection of a $100,000 plant. It is proposed also to build a plant in the United States at a cost of $250,000.

Edward O. Fuce, town engineer of Galt, Ont., was born in Kent county, Ontario, in the year 1882. After a preliminary course in the public schools he attended the Chatham Collegiate Institute for three years, and in 1900 matriculated from the Jarvis Street Collegiate, Toronto. Mr. Fuce entered the University of Toronto (Faculty of Applied Science) in the fall of 1900 and graduated with honors in 1903. His first professional experience was obtained with Mr. W. M. Davis, C.E., then of Berlin, Ont., but now city engineer of Prince Rupert, B.C. During his connection with Mr. Davis he was engaged on general municipal and street railway work.

Town Engineer Fuce, of Galt, Ont.

In June, 1904, Mr. Fuce became resident engineer of the Galt sewerage system and he conducted a branch office in Galt for Mr. Davis until August, 1907. Of the various work which came under the supervision of Mr. Fuce during that time may be mentioned sewer construction in Galt, costing approximately $250,000; sewage disposal system, $20,000, and a bridge on the Grand river, $12,000. Mr. Fuce also had charge of the Preston waterworks system and of the preliminary work for the Preston sewerage system.

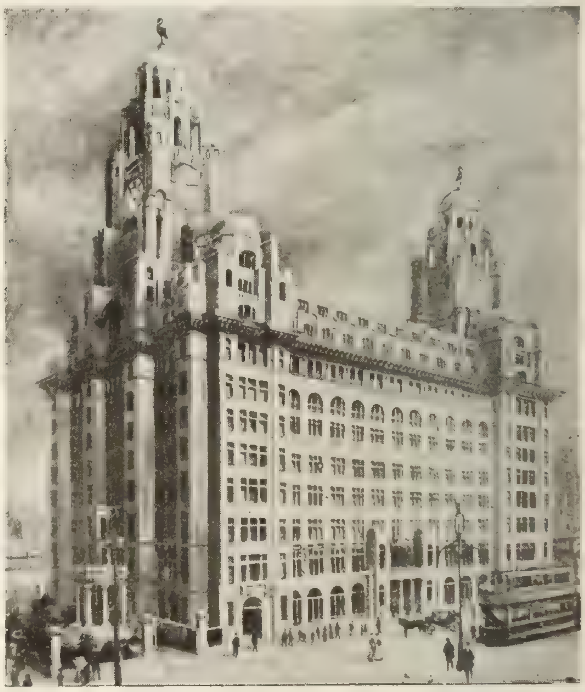
In August, 1907, Mr. Fuce was appointed engineer of the Galt sewerage system and in that year he opened an office in Galt for the purpose of engaging in private practice. He was appointed town engineer of Galt in 1910, with the privilege of continuing his private practice. Among the commissions which have been entrusted to Mr. Fuce since 1907 are two reinforced concrete buildings, 96 x 380 feet, for the Union Stock Yards at West Toronto; sewerage system, sewage disposal works and waterworks system for the town of Wingham; Fergus, Ont., waterworks system (preliminary work); sewage disposal plant for Trinity College at Port Hope, Ont., and a number of reinforced concrete bridges.

In addition to his work at Galt, Ont., Mr. Fuce is at present engineer for the townships of McKillop, Tuckersmith, Colborne, Wawanosh, Beverly and North Dumfries; also for the Wingham, Ont., and Fergus, Ont., waterworks systems, and for the Galt, Preston and Hespeler Electric Railway. Mr. Fuce is an Ontario Land Surveyor and an associate member of the Canadian Society of Civil Engineers.

C. P. R. Offices at Liverpool, Eng.

The Liverpool, Eng., headquarters of the Canadian Pacific Railway Company are now situated in the new Royal Liver Building. The white lines shown on the near corner of the building in the accompanying photograph indicate the location of these offices as shown by photographs at the Canadian headquarters in Windsor Street, Montreal. These offices are described as occupying the basement and first floor in this portion of the building.

The Royal Liver building, built and owned by the Royal Insurance Company, has just been completed and is an ornament to the ancient city of Liverpool. It occupies a commanding situation on the river front a very short distance from the Princess landing stage and the Riverside Station. Opposite are the handsome offices of the Liverpool Harbor Commissioners. A prominent feature of this massive office building is the immense clock towers which are said to contain the largest timepiece in the world —larger even than "Big Ben." Another feature not less interesting is the figure of a stork of the species known as the "Liver," which surmounts each tower. This bird, which is now practically extinct, is said to have made its home in the swamp which formerly occupied the site on which Liverpool was built and from it the city took its name as also did the Royal Liver building. The C. P. R. offices have been finished and furnished in palatial style corresponding with their surroundings and the important interests they represent in the midst of business concerns of world-wide reputation and first rank importance. Naturally most of the business done here will be in connection with the C. P. R. steamship service, but all the interests of the C. P. R. and its service in connection with Canadian traffic and Canadian development, so far as Liverpool is concerned, will be concentrated in these offices.



Royal Liver Building, Liverpool Office of the C. P. R.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Cowansville, Que.

Under consideration, sewerage system. Owner, Municipality of Cowansville, Que.; mayor, W. F. Vilas. Estimate on installation of sewerage system. Committee composed of mayor and councillors. John McCabe and G. F. L. Fuller appointed to obtain them.

Cranbrook, B.C.

Tenders called for sewerage. Owner, Corporation of Cranbrook, B.C.; city clerk, T. M. Roberts; consulting engineers, The John Galt Engineering Co., 317 Portage avenue, Winnipeg, Man. Supply and delivery of 36,500 lin. ft. of vitrified tile sewerpipe, etc. Specifications at offices of the consulting engineers. Tenders received until 20 o'clock, July 8, by city clerk. Advertisement in "Tenders and For Sale Department" of this issue.

Dundas, Ont.

Tenders called for dredging—Dresden canal. Owner, Board of Works and Property Committee, Dundas, Ont. Chairman, Wm. Lawson, Dundas, Ont. Removal of 27,500 cu. yds. of material inveolved in contract. Plans, etc. at office of J. J. Armour, C. E. Work to be done in accordance with the Jenning award. Tenders received by the chairman until June 25th.

Edmonton, Alta.

Machinery required for waterworks extensions. City engineer, A. J. Latornell, Edmonton. Two 6,000,000 gallon pumps. One pump 400 ft. head, steam turbine drive; one 80 ft. high speed engine drive. Specifications will be prepared and published at an early date.

Edmonds, B.C.

Tenders called for steel pipe. Owners, Corporation of Edmonds, W. Griffith, clerk, municipal hall; engineers, Cleveland & Cameron, 506 Winch Bldg., Vancouver. Specifications obtained from engineers on payment of $20, refunded on presentation of tender

Halifax, N. S.

Tenders to be called for sewer pipe. Owner, City of Halifax. City engineer, F. W. W. Doane; 2,400 feet 24 in. x 30 in., also 1,400 feet 30 in. concrete sewer pipe. Council will be asked to authorize purchase at next meeting.

Contemplated cement walks, $1,990. (South Park street). Owner, City of Halifax. City engineer, F. W. W. Doane. Laying 1,000 feet cement walks. To be submitted for consideration by council.

Contemplated cement walks, $5,750. Owners, City of Halifax. City engineer, F. W. W. Doane. Sidewalk has been ordered by council. Report later.

Hamilton, Ont.

Tenders called for cement walks and curb. Owner, City of Hamilton, Ont. S. H. Kent, city clerk. Engineer, A. F. Macallum, Hamilton. Cement walks and curbs done by Hamilton Board of Works. Tenders called for Friday, June 16th, close Wednesday, 21, 5 p.m. Bylaws passed and enrolled June 12th. Details and description of work furnished on request.

Estimates being prepared for waterworks extension, $1,000,000. Owner, City of Hamilton. City clerk, S. H. Kent; city engineer, A. F. Macallum. Engineer, W. Chipman, Mail Building, Toronto, is preparing estimates.

Lethbridge, Alta.

Cement sidewalks, $21,963. Owner, City of Lethbridge, Alta. Engineer, H. W. Leech, acting city engineer, Lethbridge. Contractor, Forest City Paving Co., Lethbridge, Alta., and Regina, Sask. About 22,000 sq. yds. of walk and 15,000 feet curb.

A, street grading; E, storm sewer; D, sanitary sewers; C, water mains. Owner, City of Lethbridge. Engineer, H. W. Meech, acting city engineer, Lethbridge. Contractor, N. K. Boyd, Winnipeg, Man. lump sum bid on contracts A.C.D. and E., $119,596. A=130,000 cu. yds. B=3/5 miles. D=7 miles (appox). C=10 miles (approx). Bids of other contractors tendering furnished on request.

Cement pipe, $10,667.99. Owner, City of Lethbridge, Alta. Engineer, H. W. Meech; act. city engineer, Lethbridge. Contractor, Forest City Paving Co. London, Ont., Regina, Sask., and Lethbridge, Alta. This pipe is substituted for vitrified tile piping for store sewer. It has not been definitely decided whether it will be used or not. About 14,000 ft., size 12x36 in. required

McLeod, Alta.

By-law to be submitted for waterworks and lighting system. Party interested, Municipality of MacLeod; E. F. Brown, clerk. To raise $46,000 for extension and construction of municipal system of waterworks and enlargement of electric lighting system; $23,000 for extension of sewer system. The vote will take place on June 23rd.

North Battleford, Sask.

Tenders called for waterworks extension, $10,000. Owner, Corporation of North Battleford; engineers, Cote & Nevill, Edmonton, Alta. Required, hydrants, pipe, valves. Tenders received by city clerk until June 30. Specifications mailed to bidders handling these lines of materials.

Niagara Falls, Ont.

Tenders called for pavement. Owner, City of Niagara Falls, Ont. Engineer, J. C. Gardner, Niagara Falls, Ont.; concrete sidewalks and curbs 50,000 sq. ft. walk, 2,500 ft. curb. Tenders called until June 17th by W. J. Seymour, clerk.

New Glasgow, N. S.

Water pipe required waterworks system. Town clerk, James Roy, New Glasgow. 9,000 ft. of water pipe is required at once.

Tenders called for waterworks, $200,000. Owner, Town of New Glasgow. C. A. Mitchell, engineer, Bank of New Brunswick Building. . Tenders received until 3 p.m. June 25 for 12,600 feet 22 in. steel pipe southerly from present pumping station.

Olds, Alta.

Contemplated waterworks, $30,000. Owners, Municipality of Olds, Alta. Sec.-treas., R. L. Earl, Olds. Construction of waterworks considered. Engineer, not selected yet.

Oshawa, Ont.

Tenders called for sedimentation tanks. Owners, Town of Oshawa; W. E. N. Sinclair, B.A., mayor. Consulting engineer, Frank Chappell, Oshawa. Construction of screening chambers, sedimentation tanks, sludge beds and all appurtenances thereto. Plans, etc., at office of Contract Record, 220 King street West, Toronto, and office of the consulting engineer. Tenders received until noon July 1.

Port Arthur, Ont.

Tenders called for pavements. Owner, Corporation of Port Arthur. J. McTeigue, city clerk; city engineer, J. Antonisen. Tenders received until 6 p.m. June 24th, for paving with asphalt block, sheet asphalt and bitulithic and laying and paving street car tracks according to engineer's plans. Further instructions as to specifications from city engineer, Port Arthur.

Tenders called for pavements. Owner, Corporation of Port Arthur, Ont. City clerk, J. McTeigue, Port Arthur. Asphalt block, sheet asphalt bitulithic, laying and paving street car tracks. Bay street about 4,784 sq. yards pavement; 2,930 lin. ft. curb and gutter; 3,166 sq. yds. track construction. Algoma street pavement, 4,100 sq. yds. curb gutter, 2,060 lin. ft. track construction, about 3,378 sq. yds. Similar tenders for Pearl street south, Cameron street, etc., with varied quantities. Tenders received until June 24, by city clerk.

Quebec, Que.

Tenders called for waterworks. Owner, City of Quebec, Que. Waterworks Engineer, J. Gallagher, Que.; trenching and pipe laying required for extension of water and drainage in certain streets of city. Tenders received by Waterworks Engineer until June 22, 4 p.m

Proceedings of Council, waterworks City engineer, W. D. Baillairge, Que Authorized construction and laying of new water main, on [illegible]

[illegible] and Quebec, cost taken from [illegible] 8 in. water pipe laid in [illegible] street, where said streets are paved with permanent materials. Cost [illegible].

Rannoch, Ont.
Tenders called for Youngson creek drain. Owner, Township of Blanshard, Ont.; Jno. H. Jameson, Rannoch, clerk. Plans, etc., at office of the clerk; a marked cheque for ten per cent. of amount of contract to accompany each tender. Tenders received by clerk until 5 p.m., July 1.

St. Thomas, Ont.
Tenders called for reinforced coagulating basin. Owner, Waterworks Commission, St. Thomas; Geo. E. Crocker, chairman. Tenders called until 5 p.m. June 24th for construction of a reinforced concrete coagulating basin, capacity, 400,000 gallons, at St. Thomas waterworks.

Sydney, N. S.
Paving materials required for pavements. Owner, City of Sydney, N. S. 2,400 sq. yds. of concrete. Estimate cost, $1.80 per yd.

Specifications in progress for pavements. Owner, City of Sydney, N. S. City engineer, D. McD. Campbell, Sydney, N. S. Engineer authorized to prepare plans, etc. Length of required paving, about 1,600 ft.; street from curb to curb, 40 ft.; concrete base and a 3 in. surface of macadam with a bituminous binder. Tenders called on completion of specifications. Additional information later.

Thorold, Ont.
Tenders called for sewerage works. Owner, Town of Thorold, Ont. Clerk, D. J. C. Munro; A. McCullock, mayor. Engineer, Chipman & Power, Mail Building, Toronto; labor and materials required for system of sanitary sewers comprising about 13,000 lin. ft. of pipe sewers. Plans at office of theengineers. Tenders received by town clerk until 8 p.m. June 26th.

Toronto, Ont.
Tenders called for pumping station. Owner, City of Toronto; mayor, G. R. Geary. Mason work, carpenter work, galvanized iron and roofing, gas fitting, and plumbing, plastering, painting and glazing. Plans, etc., at office of city architect, City Hall. Tenders received by G. R. Geary, chairman Board of Control, until noon June 29th.

Tenders called for main drainage. Owner, City of Toronto; G. R. Geary, chairman Board of Control; low level interceptor; section No. 43, 244 lin. feet 4 ft. 9 in. circular brick in tunnel; storm overflow sewers; Wilton, Sec. No. 1, 4,449 lin. ft. average nominal size 5 ft. x 5 ft. 6 in., brick or concrete in tunnel Wilton, Sec. No. 2, 3,562 lin. ft., average nominal size 4 ft. x 4 ft. 3 in. brick or concrete in tunnel. Plans etc., on file at office of Contract Record, B. 34 Board of Trade, Montreal and Main Drainage Works, Toronto. Tenders received by chairman Bd. of Control until July 4 .

Vancouver, B. C.
Tenders called for excavating machiners. Owner, City of Vancouver; city clerk, W. McQueen. City engineer, F. Fellows. Tenders are being called until June 26th for the purchase of excavating macinery.

Sewer pipe wanter for sewerage department. Owner, City of Vancouver; city clerk, W. McQueen, Vancouver; city engineer, F. Fellows. Tenders are being called by the city engineer's office for the purchase of sewer pipe until June 26th.

Tenders called for sewer supplies and excavating machines. Owner, City of Vancouver; city clerk, W. McQueen, Vancouver. Supplies in connection with sewer construction; machines suitable for excavating trenches. Contractors to supply their own specifications and plans. Tenders received by city clerk, until 2 p.m. June 27th.

Welland, Ont.
Tenders called for street paving. Owner, Town of Welland, G. R. Boyd, clerk. Town Engineer, D. T. Black. Asphalt block, vitrified brick, taralithic and bitulithic with brick between car tracks and extending 18 inches on outside of rails, on 6-in. foundation. Proprietors of patented pavements are requested to furnish special specifications. Tenders received until noon, June 30th, by town clerk.

Walkerville, Ont.
Bids to be received for street paving and curb, $79,000. Owners, Town of Walkerville. Engineer, Owen McKay, Walkerville, Ont. Asphalt block on a 6 in. concrete foundation and reinforced concrete. About 25,000 yds. of the former and two or three blocks of the latter, on Sandwich street, Argyle, Monmouth and Devonshire roads, and Victoria avenue. Money for the work was voted by the ratepayers Saturday, June 10th. Tenders will be called at once, the work to be completed this year.

Windsor, Ont.
Tenders called for street paving and curb, $20,000. Owner, City of Windsor, clerk, S. Lusted; engineer, M. E. Brian, city engineer. 12,000 yards concrete pavement with curb on Gladstone and Curry avenue, Ashby alley and Pelissier street. Tenders called June 14, to be closed June 27.

CONTRACTS AWARDED

Brampton, Ont.
Paving, general contractor, G. Fielder, Chatham, president, Tarlithis and Construction Co. Work will be begun at once.

Cranbrook, B. C.
Sewerage system, $94,000. Owner, City of Cranbrook; mayor, Mr. Hunt. Contract for installation, John Galf Engineering Co., 215 Kennedy Building, Winnipeg, Man. The system to be installed by November 30, 1912.

Edmonton, Alta.
Street paving. Owners, City of Edmonton, Alta. City engineer, A. J. Latornell. Contractor, Bitulithic and Contracting Co., Edmonton. $2.98 per sq. yd. for paving; gutter .65 lin. ft. Other prices ranged from $2.85 to $2.65 and .68 to .78 respectively.

Minnedosa, Man.
Contract awarded for paving, $7,000. Owner, Municipality of Minnedosa, Man. Gravel, granite and cement 35,000 sq. ft.

Railroads, Bridges and Wharve

Brandon, Man.
Tenders called for passenger depot, $60,000. Owner, Canadian Pacific Railway, Winnipeg, Man.; division engineer, F. Lee, Winnipeg; re-building of major portion of depot, 3 storeys, cut stone and brick, steam heating, electrical work, roofing and sheathing paper. Tenders received until 12 K. June 28, by division engineer. Tenders called June 13.

Clifford, Ont.
Tenders called for bridge. Owner, county of Wellington, Ont.; chairman, Boundry Line Bridge Com., H. Graef, Clifford. Clerk, W. D. McLellan, Harriston, Ont. Construction of one 10-ft. span flat top concrete bridge and one 45-ft. span steel bridge on concrete abutments for county of Wellington. Plans, etc., for both concrete and steel work at office of W. D. McLellan. Tenders received by W. D. McLellan until June 23rd.

Dalhousie, Restigouche Co., N. B.
Tenders called for breakwater. Owner, Department of Public Works, Ottawa. Secy., R. C. Desrochers. Construction plan, etc. at offices of E. T. P. Shewen, district engineer, St. John, N. B. Geoffrey Stead, district engineer, Chatham, N. B., and on application to the postmaster at Dalhousie, N. B. Tenders received by secretary until July 5th.

Edmonton, Alta.
Bridge. Contractor, Connel Spencer Construction Co., Edmonton; engineer, A. T. Latornell, city engineer. Substruction of east end bridge; concrete $10 per yd. forms and copper dams $3 per ft., excavating, $1.50.

Fort William, Ont.
Excavation started for freight sheds. Owners, Grant Trunk railway, Fort William, Ont. Ground being broken. Information regarding construction, etc, later.

Golden, B. C.
Tenders to be called for bridge, $25,000. Owners, Department of Public Works, Victoria, B. C.; engineer, J. E. Griffiths, public works engineer, Victoria, B. C. New swing bridge across Columbia river, 42 miles south of Golden to provide facilities for settlers of Windermere district. Definite date bids called not ascertained. Report later.

Granby, Que.
Contemplated bridge, (9th Range, tp. of Granby). Owner, Township of Granby, Granby. One span, 35 ft. width 16 ft., stone foundation. Bridge to be erected within the next two months Prices solicited. For further information address A. J. Gendreau, mayor, Mawcook, Que.

Halifax, N.S.
Tenders called for piers and sheds, deep water terminals, I.C.R. Owner, Department of Railways and Canals, Ottawa; secretary, L. K. Jones, Ottawa; construction of reinforced cement; concrete pier and sheds at the deep water terminus, Intercolonial Railway. Plans, etc., at office of chief engineer, Department of Railways and Canals; office of the chief engineer, I. C. R., Moncton, N.B.; consulting engineer, J. Kennedy, Montreal. Tenders received by the secretary until noon, July 20th.

Harriston, Ont.

Tenders called for bridge. Owner, township of Minto. Clerk, W. D. McLellan, Harriston, Ont. One 32-ft. concrete girder bridge and one 70ft. span steel bridge on concrete abutments for township of Minto. Plans, etc. for both concrete and steel work at office of W. D. McLellan. Tenders received by W. D. McLelland until June 23rd

Lethbridge, Alta.

Contemplated power house equipment. Owner, Town of Lethbridge; supenintendent, Arthur Reid, Lethbridge. The installation of street railway will necessitate extension to boiler room and power house and installation of four boilers, extension to present economizer and coal conveyor, electrical unit and steam driven exciter, a sub-station and car barn, a motor generator and switching apparatus.

Lindsay, Ont.

Tenders called for bridge, (Mud Lake Narrows). Owner, township of Carden, Co. of Victoria; clerk, J. R. McNeillie, Lindsay. Steel and concrete; 2 steel spans with concrete floors, 60 ft. over all, 14 ft. roadway one 120 ft. span; stone piers to receive one 120-ft. span; stone filling of approaches. Plans, etc. at office of county clerk, Lindsay and Whitby. The committee claims the right to accept tender for either two spans or one; 3 piers or two, etc. Tenders received until July 5th by county clerk.

Markham Township

Tenders to be called for bridge, $2,800. Owners, County of York, H. G. Ramsden, clerk, Toronto. Engineers, Bowman & Connor, 36 Toronto street, Toronto. Steel concrete abutments 40 ft. arch. Tenders received after June 26th, by engineers.

Melford, Guysboro Co., N.C.

Tenders called for wharf. Owner, Department of Public Works, Ottawa, Ont; secretary, R. C. Desrochers, Ottawa, Ont.; wharf and stone approach. Plans, etc., at the office of E. G. Millidge, district engineer, Antigonish, N.S., and on application to the postmasters at Mulgrave, N.S., and Guysboro, N.S. Tenders called until July 5.

Niagara Falls, Ont.

Equipment required for cableway. Owner, J. E. Gardner, Niagara Falls, Ont. Full cableway layout.

Ottawa, Ont.

Tenders called for protection works. (Soulanges Canal). Owner, Department of Railways and Canals, Ottawa. secretary, L. K. Jones, Ottawa. Plans etc. at office of the chief engineer, Department of Railways and Canals, at office of the superintending engineer of the Quebec canals, 2 Place d'Armes, Montreal. Tenders received until June 27th by L. J. Jones.

Oshawa, Ont.

Tenders called for bridge, (4th concession East Whitby). Owner, Village of Cedardale, Ont. Reeve, H. Gifford, Cedardale; engineers, Bowman & Connor, 36 Toronto street, Toronto; 36x20 ft. concrete arch bridge. Tenders received by William Purves, Columbus, Ont., until noon, June 30th

Port Arthur, Ont.

Tenders called for railroad. Owners, MacKenzie, Mann & Co., Ltd., Toronto. Tenders to include clearing, grubbing, grading, bridges, trestles, culverts, masonry, fencing, telegraph line, track-laying and ballasting. Plans, etc., at offices of MacKenzie, Mann & Co., Ltd., 1 Toronto street, Toronto. Tenders received by MacKenzie, Mann & Co., until July 1st. Section covered—Port Arthur to boundary line between end of Sec. 1, Kapuskasing lake; Kapuskasing lake to Sellwood Jct.

Redditt, Ont.

Tenders called for station buildings. Transcona, Man., (National Transcontinental railway). Owners, commissioners Transcontinental railway, Ottawa, Ont. Plans, etc., at office of Gordon Grant, chief engineer, Ottawa, Ont., and of Mr. S. R. Poulin, district engineer, St. Boniface, Man. Tenders received by sec, until July 11.

St. Mary's, Ont.

By-law carried for bridge, $5,000 (over Trout Creek on Wellington street N.). Owner, town of St. Mary's, Ont. Clerk, Thomas M. Clark.

Sydney, N.S.

Specifications in progress for bridge, Washington Brook, Whitney. Owners, Corporation of Sydney; engineer, D. McD. Campbell, Sydney; steel, 200 feet length, 26 feet width; contractors to furnish complete stress sheets and detail drawings showing sectional area and dimensions of all parts, members of structure and mode of construction. Tenders will be called on completion of specifications.

St. John, N.B.

Tenders called for harbor, Courtenay Bay. Owner, Department of Public Works, Ottawa, Ont.; secretary, R. C. Desrochers, Ottawa; construction of breakwater, wharves, dredging of channel and basin; also filling shown on plan; also construction of dry dock and ship repairing plant (first class). Plans, etc., at offices of the district engineers at St. John, Halifax, N.S.; Montreal, Que.; Toronto, London, Ont., and at the office of the High Commissioner for Canada, London, Eng. Tenders received by secretary until 4 p.m., August 10

Thornhill, Ont.

Tenders called for bridge, township of Markham). Owner, Markham township. Engineer, Bowman & Connor, 36 Toronto street, Toronto; steel superstructure with concrete abutments for a concrete arch. Township of Markham near Thornhill. Tenders received by clerk of Markham township, Unionville, Ont., until June 30th. For further information apply to engineers; T. Paget, Thornhill.

Toronto, Ont.

Tenders called for seawall, Lake Ontario, vicinity of exhibition grounds. Owner, City of Toronto, Ont.; chairman [illegible] Hall; city engineer, C. H. Rust, Toron[illegible] of Railways and Bridges, City Engineer's [illegible] man, Board of Control, until noon, July 3rd.

[illegible]

for two bridges in Wellington and Peel counties. Supplementary report later.

Trail, B. C.

Tenders to be called for bridge, $150,000. Owners, Department of Public Works, Victoria, B. C.; engineer, J. E. Griffiths, Public Works engineer, Victoria, B. C. New bridge across Columbia at Trail. Authority given to instal fixed centre span, but piers to be of sufficient strength to support steel towers should it be decided to replace fixed with a movable span. Date bids to be called not ascertained. Report later.

Vancouver, B.C.

Proposed work, bridge, delta District. Parties interested, municipalities of Delta, Richmond and City of Vancouver, city clerk, W. McQueen; proposition to ask provincial government to have estimates made for construction of bridge to connect the above municipalities. Endorsed by a representative meeting. Those interested are: Alds. McMaster and Campbell, Vancouver city council; A. G. McCandless and W. Skens, board of trade, Vancouver; W. A. Kirkland, Delta Council.

Winnipeg, Man.

Tenders called for car shops. Owners, Commissioners of the National Transcontinental Railway, Ottawa. Secretary, P. E. Ryan, Ottawa. Construction and erection complete. Plans, etc. at offices of chief engineer, Gordon Grant, Ottawa, or S. R. Poulin, district engineer, St. Boniface, Man. Forms of tender to be supplied by W. T. Press, mechanical engineer, Ottawa.

Whitby, Ont.

Under discussion, bridge, $5,000. Owner, County Council; J. E. Farewell, K.C., County Clerk, Whitby; engineer pro tem, F. Chappell, C.E., Oshawa, Ont.; present steel future, either steel or concrete, 1 span, 67 feet, width 18 ft. to 20 ft., foundation, concrete abutments. It is possible that alternative designs will be called for concrete abutments wanted certain. Permanent engineer not yet appointed. Chappell to report.

CONTRACTS AWARDED

Lethbridge, Alta.

Grand stand; $26,010. Owner, City of Lethbridge, Alta. Architect, E. E. Carver, Lethbridge, Alta; general contractor, Smith Bros. & Wilson, Lethbridge; wood construction 360' x 75.

Toronto, Ont.

Contract awarded for railway, (between 180-200 C.N.R. Toronto-Ottawa branch). Owner, MacKenzie, Mann & Co., Toronto street, Toronto. General contractor, E. MacKenzie, 88 King street E., Toronto; sub-contractors, P. W. MacLean, Brechin. Mile 180-182¾; Paul Allan, Chaffie's Lock Mile 182¾-182¼; L. MacLean & R. MacIsaac, Brechin, M. 183¼-185½; D. J. O'Donnell, Toronto; A. O'Donnell, Beaverton and S. MacKenzie, Elgin; M. 185½-189½, Stewart & Hart, Portland, Ont.; M. 192-196; Chas. A. Cook, Brechin; M. [illegible] Northern Ont. Ry.

Vancouver, B. C.

[illegible] er, Grand Trunk railway, head office, [illegible] Seattle, Wash., U.S.A. The company is considering the erection of a similar [illegible]

Public Buildings, Churches, Schools, etc.

Brandon, Man.
Plans completed for Fraternal Temple, $6,000. Owner, Fraternal Hall, Ltd. Brandon, architect, plans have been prepared jointly by local architects and definite information not yet available. A site has ben purchased and letters patent granted.

Brantford, Ont.
Contemplated hospital addition, $100,000. Parties interested, Hospital Board and County and City Councils. To provide additional accommodation, city will be asked to vote $90,000, county $10,000 approximately. Vote will be taken shortly. Supplementary report later.

Dunnville, Ont.
Tenders called for school plumbing. Owner, Board of Education, Dunnville, Ont. Chairman, Thos. Marshall, Dunnville. Sec. Bldg. Com., W. G.H. Gilpin, Dunnville; plumbing of new high school; also of the public school. Plans, etc. with chairman. Tenders must be made in separate enclosures; received by the secretary after June 12th, until June 27th.

Fort William, Ont.
Tenders to be called for Y. M. C. A. $75,000. Owner, Y. M. C. A., Fort William; architect, R. E. Mason, Fort William; 3 storey solid brick, 100 x 100 ft., cement foundation, cut stone, structural iron, fire escapes, fireproof doors, electrical work, steel beams, iron columns. Tenders called in about ten days. If bids are within limit, may build 4 storeys. Supplementary report later.

East Sherbrooke, Que.
Work in progress for fire hall, $5,000. Owners, City of Sherbrooke; architect, L. N. Audit, Sherbrooke. City are building by day labor.

Glencoe, Ont.
Tenders called for school. Owner, Aldeorough township. J. A. McRae, sec.-treas., Wardsville, Ont. Tenders received until June 24, 1911.

Hamilton, Ont.
Plans being prepared for school, Maple avenue. Owner, board of education, Hamilton, Ont.; architect, A. W. Peene, Hamilton; two storeys, brick and stone, steam heating, electric lighting, stone foundation. Date for receiving tenders not decided yet. Supplementary report later.

Plans being prepared for school, Trolley street. Owner, board of education, Hamilton; architects, Stewart & Witton, Hamilton. Hamilton & Provincial Loan Building, Hamilton. Two storeys, 20 rooms, brick, steel and stone, steam heating, electric lighting, stone foundation. Date for receiving tenders not decided yet. Supplementary report later.

Architect to be chosen for public school. Owners, Board of Education, Hamilton. Building Committee authorized to engage architect to prepare plans for a 10-room school on Maple avenue and to call for tenders.

Haileybury, Ont.
Tenders called for school, (Rorke avenue). Owner, Separate School Board, Haileybury. Sec.-treas., G. T. Smith. Architect, A. D. Pillar, Haileybury. Plans, etc., at office of the architect. Tenders received until June 20, by sec.-treas.

Hardieville, Alta.
Tenders to be called for school, $8,000, (4 miles north of Lethbridge). Owner, Lethbridge public school board. Architects, Messrs. Whiddington Bros., Lethbridge, Alta.; lumber construction, concrete foundation, hot air heating, electric light, standard plumbing, shingle roof, 1 storey, electrical work 100 x 50.

Kelwood, Man.
Contemplated school, $8,000. Owner, Kelwood School Board. Debentures to be voted for June 15, 1911. Report later.

Lennoxville, Qne.
Plans in progress for academy, $18,000. Owner, Protestant School Commission, Lennoxville; architect, J. W. Gregoire, Sherbrooke; 3 storeys, stone and brick, 54x85, stone foundation, electric light. Tenders received after July 1. Time to close not fixed yet.

Merritt, B. C.
Tenders called for hospital, $16,000. Owners, Hospital Board, Merritt, B. C. Architect, Blackmore & Birds, Loo Building, Vancouver; 2 storey, concrete foundation, frame construction, raecolithor terrazo tiling, hospital type plumbing fixtures, hot water heating. Tenders received now by architects.

Montreal, Que.
Tenders called for church, (corner of Durocher street and Fairmount avenue. Owner, Baptist Congregation, Montreal. Architect, J. E. Adamson, St. Catherine street W., Montreal. Stone and brick 65x100 ft., seating capacity, 1,000. Tenders will be called next week. Building to be completed about Jan. 1, 1912.

Meaford, Ont.
Tenders called for public school. Owner, Meaford Public School Board. Sec., C. T. Sutherland, Meaford. Addition of 2 rooms to school. Plans, etc., at office of the secretary. Tenders received until June 23rd by the secretary.

Moose Jaw, Sask.
Contemplated new post office, $300,000. Owners, Dominion Government, Ottawa. Bids will be called for in about two weeks. Report later.

Plans in progress for church, $120,000. Owners, Trustees Presbyterian church; architect, F. Glemenshaw, Regina. Plans are being prepared but work will not commence until location of new building is decided.

Tenders called for school, $100,000. Owner, Moose Jaw School Board; architect, R. G. Bunyard, Moose Jaw; 2 storeys and basement, reinforced concrete and brick 137x82 concrete foundation fan system, heating, electric light, gas, iron roof, interior finish, oak and fir. Tenders called June 12, close about the 26th.

Niagara Falls, Ont
Plans wanted for hockey rink, $7,000. Owners, Niagara Falls Hockey and Athletic Club, Ltd., Niagara Falls, Ont. Secretary, R. C. Macfarlane. Size of ice space 75 x 180 ft., seating capacity not less than 2,500. Plans to remain property of designer, same to be returned to unsuccessful competitors. 2½ per cent. uaid to the successful architect for plans, etc. Designs received by secretary until and including July 5th.

Newdale, Man.
Tenders to be called for school, $12,000. Owners, Municipality of Newdale. Sec.-treas., Johnson;architect, W. A. Elliott, Brandon, Man.; one storey brick and stone, 64 x 36; Muller hot air heating. Pitch roof. Plans accepted June 6. Tenders called June 20, close June 27th. Received by owners.

Okotoks, Alta.
Contemplated school, $25,000. Owner, Board of Education, Okotoks. Architect, not yet chosen; brick, stone foundation, 2 storey, hot water heating, modern plumbing.

Red Deer, Alta.
By-law submitted for grading, $3,000; isolation hopsital, $6,000; sewer extension, $7,000; cement sidewalks, $6,000. Party interested, Municipality of Red Deer, Alta. Secretary-treasurer, A. T. Stephenson, Red Deer, Alta. By-law will be submitted on June 26.

Regina, Sask.
Tenders called for addition to school. Owner, Regina Public School, Regina. Sec.-treas., J. H. Cunningham, Regina. Architects, Messrs. Sharon & Darrach, 1745 Scarth street, Regina. Plans, etc. at office of the architects. Tenders received by J. H. Cunningham until 12 noon, June 26th.

Renfrew, Ont.
Tenders called for addition to Collegiate. Owners, Renfrew School Board. Sec.-treas., Geo. Eady, jr., Renfrew. The addition to be used as a gymnasium. Plans, etc., with J. D. McNicol. Tenders received until June 16th, by Geo. Eady.

St. John, N. B.
Contemplated garbage disposal plant $50,000. Owners, City of St. John. City engineer, William Murdock. Enquiries being instituted.

St. Charles, Kirkfield Park P. O. Man.
Tenders called for municipal hall. Owners, Rural Municipality of Assiniboia. Sec.-treas., Frank Ness, Kirkfield Park P. O., St. Charles, Man. Architects, Messrs. Hooper & Hooper, 303 McIntyre Block, Winnipeg. Brick veneer. Plans, etc., at office of the sec.-treas., and at office of the architects. Tenders called until June 22, by sec.-treas.

Sarnia, Ont.
Tenders called for rink. Architect, R. W. Fawcett, Sarnia, Ont. Curling rink. Plans are ready and can be seen at office of architect. Tenders received by architect until 6 p.m. June 22nd.

Snowflake, Man.
Tenders called for school. Owner, Snowflake Consolidated S. D. No. 1111. Sec.-treas., Jas. Fyfe, Snowflake. Construction, brick. Plans, etc., at the Builders Exchange, Winnipeg, or with the sec.-treas. Tenders called until June 24, by the sec.-treas.

St. Thomas, Ont.
Tenders called for public school. Owner, Board of Education; sec.-treas., H. W. Talman, 460 Talbot street; architect, J. T. Finlay, Southern Loan Chambers, St. Thomas. Masonry, carpentry, slating, plumbing, plastering, painting, hot-

air heating, electrical and galvanized iron work. Plans, etc., with architect.

Toronto, Ont.

Tenders to be called for additions to schools, $100,000, Manning avenue and Essex street. Owner, Board of Education, Toronto; secretary, W. C. Wilkinson, City Hall, Toronto; superintendent of buildings, A. E. Bishop, Toronto. Three storey brick and stone, each; Essex street, 9-room addition; Manning avenue, 6-room. The completion of Manning avenue includes a separate building for domestic science and manual training departments of 2-storey. Cost includes above with midsummer repairs. Tenders called within two weeks.

Plans in progress for church. Owner, Northern Congregational Church, Toronto. Architect, Wickson & Gregg, 59 Yonge street, Toronto. Site has been purchased and plans are being prepared. Supplementary report later.

Tenders called for Clubhouse, $70,000. Owner, Ontario Club, Toronto; architect, Sproat & Rolph, 90 Yonge street, Toronto. Tenders called for structural iron for use in renovation of old Standard Bank building, from June 12, to 17.

Tenders called for church and Sunday School, (corner of College and Montrose). Owner, West Presbyterian Church, Toronto. Architects, Gordon & Helliwell, Confederation Life Building, Toronto. Various trades required. Tenders received by the architects until noon Pune 24th.

Tenders to be called for parish house, $50,000. Owners, Warden of St. Stephens Church, College street, Toronto. Architects, Edwards & Saunders, 18 Toronto street, Toronto; brick, stone foundation, hot water heating, electric light, slate roof, 2½ storeys. Plans have been approved and tenders will be called shortly.

Tyvan, Sask.

Tenders called for public school. Owners, Board of School Trustees. Sec.-treas., R. H. Wayland, Tyvan; 4-room, brick veneer. Plans, etc., with sec.-treas., and H. W. Hilton, Tyvan. Tenders called until June 17th by sec.-treas.

Victoria, B. C.

Tenders to be called for public building. Owners, Provincial Government, Victoria, B. C. Architect, F. M. Rattenbury, Victoria B. C. Addition to two wings to be devoted to library purposes. 4 storey, stone construction, with steel frame. Tenders called shortly.

Vancouver, B.C.

Contemplated school, (Shaughnessy Heights. Owners, Western Residential Schools, Ltd., (capital $200,000.) Probable architects, McLure & Fox. About 18 months will be required to complete plans. Rev. John McKay, D. D., Vancouver, is interested.

Plans being prepared for church, $70,000. Pendrell and Thurlow streets. Owner, First Congregational Church; architect, Sharpe & Thompson, 536 Hastings street, Vancouver; brick and stone, seating capacity 700. Plans are nearly completed.

Excavation tenders called for general hospital. Owners, General Hospital Board; Geo. Haddon, secy., Vancouver. Architects, Messrs. Grant & Henderson, Williams Building, Vancouver. Tenders for excavation were called for June 9th.

Virden, Man.

Time extension on tenders for municipal building. Owners, Town of Virden, Man., Town Clerk, J. F. C. Menlove, Virden; architect, W. A. Elliott, Brandon. Building 60 x 107, 2 storeys and basement, brick on concrete foundation, to be used for court room, offices and opera house. Tender to be accompanied by marked cheque of $600. Plans, etc., at offices of the architect and town clerk. Tenders called until 6 p.m., June 30th, by town clerk.

Westmount, Que.

Equipment wanted for fire station. City Engineer, A. Currie, Westmount, Que. Combined chemical and hose wagon of the motor type. Tenders called for construction of station in about two weeks.

Winnipeg, Man.

Tenders called for fire stations. Owner, City of Winnipeg, Man. Sec. Board of Control, M. Peterson, 405 Builders Exchange, Winnipeg. Supply of labor and materials required in erection of Fire Stations No. 12 and 13. Plans at office of the architects. Tenders received by the chairman, Board of Control, until June 29th.

Westmount, Que.

Tenders to be called for fire station. Owner, Corporation of Westmount; architect, City Engineer Currie, Westmount; 47 x 77 ft., brick foundation, hot water heating, electric light, cement work, cut stone, brick, fireproofing, electric bells, reinforced concrete. Tenders will be called in about two weeks.

Windsor, Ont.

Plans being prepared for Masonic Temple Building, $60,000. Owners, Masonic Temple Association of Windsor; architects, Jacques & Williamson, Windsor, Ont., 4 storey brick building, 100 ft. square, ground floor, for stores, offices and lodge rooms on upper floors. Tenders probably called in about a month. Supplementary report later.

CONTRACTS AWARDED

Cranbrook, B. C.

Indian school, $100,000, (St. Eugene Mission, near C.) Owner, Indian Industrial School, Cranbrook. General contractor, John Wood, Fernie, B. C.

Fort William, Ont.

Public school, $45,000. Owner, Board of Education; architect, R. E. Mason, Fort William; general contractor, R. McLeod, Fort William, 65 x 60, 2 storeys solid brick. Tenders for heating, plumbing and lighting called in about 10 days.

Guelph, Ont.

Isolation Hospital, $18,000. Owner, City of Guelph; architect, Mr. Tanner, Guelph; 2 storeys and basement, solid brick, 40x80; general contractor, P. H. Secord & Sons, Brantford; heating, Stevenson & Malcolm, Guelph; plumbing, not let. Building to be completed October 9, 1911.

Montreal, Que.

School, $15,000, (434 St. Charles Borromee street). Owners, Seminary of Sulpice, 66 Notre Dame West. Architects, E. Payette, 103 St. Francois Xavier, Montreal. General contractor, O. Lemay, 147 Cherrier; stone and brick, 50x36, 2 storeys.

St. George, Ont.

Church, $14,200. Owner, Baptist Church, Dr. Patten, chairman Building Committee. Architects, Taylor & Taylor, Brantford; basement stone, balance brick, 450 sittings. Mason, Thos. Hull, Lynden; carpenter, plasterer, iron, stone, sheet metal, F. M. Misener, Jerseyville, Ont.; heating and plumbing not yet let.

Residences

Fort William, Ont.

Plans prepared for residence, $22,000. Owner, W. J. Ross, Fort William, Ont; architect, R. E. Mason, Fort William, Ont.; dressed stone, concrete, cut stone, brick, mantels, plate glass, art glass. Building commenced within next week or so. No. bulk tenders called for.

Montreal, Que.

Tenders called for apartments. (St. Urbain street). Owner, Melbourne Apartments; architect, Joseph Perrault, 2,106 Park avenue, Montreal. Dressed brick and sand stone, concrete piles for foundation, hot water heating, electric lighting, gravel and tar roofing, 4 storey Siggwart concrete floors, fireproof, fireproof stairways, steel frame. Tenders received until June 21st, 5 p.m.

Tenders called for apartment house, architect, Joseph Perrault, "Fairmount Court," 2106 Park avenue, Montreal. 24 apartments contained. Plans, etc., at office of the architects. Tenders received until June 21 by architects.

Newcastle, N. B. .. ..

Plans in progress for residence, $10,000. Owner, James Rundle, Newcastle, N. B.; architect, H. H. Mott, St. John, N. B. Tenders called shortly. Will be built by day work.

Toronto, Ont.

Tenders called for residence. Owner, C. F. Richardson, Toronto; architect, Sharp & Brown, 18 Wellington street E. Toronto; brick, brick foundation, hot water heating, electric lighting, shingle roofing, Georgia pine finish, 40x28, electrical work, mantels. Tenders received until June 16th.

Specifications completed for 11 residences, $11,000. Owner, W. Ridout, 1636 Queen street east. Private plans, rough cast, brick foundation, gas lighting, shingle roof, two storeys, 40 x 41. 7 detached and 4 attached dwellings. Building will start shortly.

Contemplated residence, $4,000. Owner, Dr. Slade, Toronto; architect, H. Bryan Gilbert, 47 Wellington street east, Toronto; brick, brick foundation, hot water heating, gas and electric lighting, slate roof; hardwoor interior finish, 2½ storeys; montels, plate glass. Owner at present in England. Tenders called on his return.

Tenders called for residence, $4,000 Owner W. Charles, Baine avenue, Toronto; architect, Sharp & Brown, 18 Wellington street east, Toronto; brick, brick foundation, hot air heating, electric light, shingle roof, 2½ storeys, 42 x24. Tenders received after June 15, until June 23rd

Plans prepared for residence, $2,800 Owner and builder, G. A. [illegible],

Tenders and For Sale Department

TOWN OF OSHAWA, ONT.

Sedimentation Tanks, etc.

[illegible] [illegible] [illegible] by a marked [illegible] $500 [illegible] [illegible] received up to Saturday noon, **July 1st, 1911**, for the construction of [illegible] [illegible], sedimentation tanks, sludge beds and all appurtenances thereto.

[illegible] [illegible] [illegible] specifications are held for inspection at the offices of the "Contract Record," 220 King street west, Toronto; the "Canadian Engineer," Church street, Toronto, and the office of Mr. T. Aird Murray, C.E., Consulting Engineer, Lumsden Building, Toronto.

Copies may be obtained from the Town Engineer, together with forms of tender, upon deposit of a fee of $1.00, which will be returned when plans are returned.

W. E. N. SINCLAIR, B.A., L.L.B.,
Mayor.

FRANK CHAPPELL,
Town Engineer.

[illegible] Hall, Oshawa.

Department of Railways and Canals

Intercolonial Railway

Improvements at Halifax

Sealed tenders addressed to the undersigned and endorsed "Tender for Pier and Sheds," will be received at this office until 12 o'clock noon of the **20th day of July, 1911**, for the construction of a reinforced cement concrete pier and sheds at the Deep Water Terminus of the Intercolonial Railway, at Halifax.

Plans, specifications and form of contract to be entered into may be seen and full information obtained on and after the 20th day of June, 1911, at the office of the Chief Engineer, of the Department of Railways and Canals, Ottawa, Ont., and at the office of the Chief Engineer of the Intercolonial Railway at Moncton, N.B., or at the office of the Consulting Engineer, Mr. John Kennedy, Montreal.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $25,000, made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals.
Ottawa, June 5th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 24-25

Tenders for Bridges

Tenders will be received by the undersigned until **Saturday, July 1st**, for the concrete work for a steel bridge to be erected in the Township of Burford, Ont.

Plans and specifications may be seen at any time at my residence, Cathsart, Ont.

WM. MILMINI,
Reeve.

24-25

Steam Shovels

We own and have for sale near Buffalo, N.Y., two Vulcan 75-ton 2½-yard steam shovels; late model, with new extra large boilers and in excellent condition; also one 70-ton. These will stand most rigid inspection and we are offering them at unusually low prices. Confer with us.

WILLIS SHAW MACHINERY CO.,
39 So. La Salle Street,
Chicago, Ill.

TOWN OF VIRDEN

Debentures

Sealed tenders will be received by the undersigned until noon **Thursday, July 6, 1911**, for the purchase of an issue of twentn years debentures of the Town of Virden to the value of $25,000, bearing interest at 5 per cent. dated July 2, 1911, with equal annual payments of principal and interest.

The said debentures covering the cost of construction and finishing of certain additions to the present municipal building, etc.

Offers to be made payable net, at the Canadian Bank of Commerce, Virden, Man.

Valadity of said debentures guaranteed by the Municipal Commissioner of Manitoba. Tenders to be marked "Tenders for Debentures." The highest or any offer not necessarily accepted.

J. F. C. MENLOVE,
Sec.-Treas Town of Virden.

Virden, Manitoba. 24-25

Tenders Wanted

Sealed tenders will be received by the undersigned, up to **Friday, June 23rd**, at one o'clock p.m., for the construction of one 10-foot span flat top concrete bridge and one 45-foot span steel bridge on concrete abutments for the County of Wellington, also one 32-foot span concrete girder bridge and one 70-foot span steel bridge on concrete abutments for the Township of Minto.

Plans and specifications for both concrete and steel work can be seen at the office of W. D. McLellan in the Town of Harriston, where the tenders will be opened.

The lowest or any tender not necessarily accepted.

Tenderers will be required to furnish satisfactory security for the fulfilment of their contracts.

H. GRAEF,
Chairman Boundry Line Bridge.
Clifford, Ont.

W. D. McLELLAN,
Clerk of Minto,
Harriston, Ont.

24-25

TOWN OF THOROLD

PROVINCE OF ONTARIO

Sewerage Works

Notice to Contractors

Sealed tenders will be received by the Town Clerk until 8 p.m. on **Monday, June 26th, 1911**, for the labor and materials required for the construction of a System of Sanitary Sewers, comprising about 13,000 lineal feet of pipe sewers.

Plans and specications may be seen at the office of the Engineers, Mail Building, Toronto. Deposit cheque for $1,500 required for labor, and $500 for sewer pipes.

The lowest or any tender not necessarily accepted.

A. McCULLOCH, Esq., Mayor,
Thorold, Ont.

CHIPMAN & POWER, Engineers,
Toronto, Ont.

D. J. C. MUNRO, Esq., Town Clerk,
Thorold, Ont.

24-25

CITY OF PORT ARTHUR

Tenders for Pavement

Sealed separate tenders, endorsed on envelope, "Tender for Paving," will be received by the undersigned up to 6 o'clock p.m. of **Saturday, June 24th, 1911**, for the paving of streets in the city of Port Arthur as undernoted:—

1. Bay street, Cumberland to Algoma:
   With Asphalt Block, Sheet Asphalt and Bitulithic, and laying and paving street car tracks according to Engineer's plans, etc.
   Estimated quantities:—
   Pavement, approximately 4,784 sq. yds.
   Curb and gutter, approximately 2,930 lin. ft.
   Track construction, approx. 3,166 sq. yds.
2. Similar tenders for Algoma st., Bay to John:
   Estimated quantities:—
   Pavement, approximately 4,100 sq. yds.
   Curb and gutter, approximately 3,060 lin. ft.
   Track construction, approx. 3,378 sq. yds.
3. Similar tenders for Algoma st., John to Queen.
   Estimated quantities:—
   Pavement, approximately 1,685 sq. yds.
   Curb and gutter, approximately 940 lin. ft.
   Track construction, approx. 845 sq. yds.
4. Similar tenders for Pearl street, South Water to Court:—
   (No Street Car Tracks)
   Estimated quantities:—
   Pavement, approximately 4,360 sq. yds.
   Curb and gutter, approximately 1,836 lin. ft.
5. Similar tenders for Cameron street, Cumberland to Court:—
   (No Street Car Tracks)
   Estimated quantities:—
   Pavement, approximately 1,780 sq. yds.
   Curb and gutter, 1.340 lineal feet.

This latter street to include tender for construction with RocMac.

All tenders must include construction of proper curbs and gutters.

Further instructions as to specifications and forms of tender may be obtained from the City Engineer.

A marked cheque for ten per cent. of the estimated amount of contract must accompany each tender.

The lowest or any tender not necessarily accepted.

J. McTEIGUE, City Clerk.

Corporation Offices, Port Arthur,
June 10th, 1911. 24-25

Bridge Tenders

Sealed tenders will be received by William Purvis, Esq., Columbus, Ontario, for the building of a 36 x 20 foot concrete arch bridge on the fourth concession East Whitby, near Oshawa, up to noon on **Friday, June 30th.**

For further information apply to the undersigned.

BOWMAN & CONNOR, Engineers,
24-25 36 Toronto Street, Toronto.
H. GIFFORD, Reeve,
Cedardale, Ont.

TENDERS

Sealed tenders addressed to the undersigned will be received until 5 o'clock p.m. on Saturday, June 24th, for the construction of a reinforced concrete coagulating basin, of a capacity of approximately 400,000 gallons, at the St. Thomas Waterworks.

Plans and specifications may be seen and form of tender obtained at the office of the City Engineer.

The Commission does not bind itself to accept the lowest or any tender.

GEO. K. CROCKER,
Chairman Waterworks Commission.
St. Thomas, June 9, 1911. 24-25

CITY OF CRANBROOK, B.C.

Sewer Works

The Corporation of the City of Cranbrook invite tenders for the supply and delivery of the following:

36,500 lin. ft. of vitrified tile Sewer Pipe, from 18 in. to 6 ft. diameter, also Y Junctions.
123 Cast Iron Manhole Covers, also Catchbasin Covers and Flap Valves.
800 Barrels Portland Cement.

Specifications and all information may be obtained at the offices of the Consulting Engineers, The John Galt Engineering Company, 317 Portage avenue, Winnipeg.

Tenders should be in the hands of the undersigned not later than 20 o'clock on **Monday, 3rd July, 1911.**

The lowest or any tender may not be accepted.

THOS. M. ROBERTS,
City Clerk.
Cranbrook, B.C. 25-25

TENDERS

for Steel and Concrete Bridge

Mud Lake Narrows

TOWNSHIP of CARDEN

County of Victoria

Tenders will be received by the undersigned until **Wednesday, July 5th, 1911,** for the following works:

1. Two steel spans with concrete floors, each 60 feet over all, 14 feet roadway between curbs, to carry a 10-ton roller at least, and to be approved by the Engineer of Highways of the Department of Public Works of Ontario.
2. One 120 feet span, same width and relative strength.
3. Three concrete piers to receive two 60-ft. spans.
4. Two concrete piers to receive one 120-ft. span.
5. Stone filling of approaches.

Plans and specifications may be seen at the office of the County Clerk, Lindsay and Whitby.

The committee claims the right to accept a tender for either two spans or one span; three piers or two piers and to decline any or all of the tenders.

J. R. McNEILLIE,
Clerk, County of Victoria.
Lindsay, June 12, 1911

Bridge Tenders

Sealed tenders will be received by the Clerk of Markham Township, Unionville, Ont., for the building of a steel superstructure with concrete abutments for a concrete arch in the Township of Markham, near Thornhill, up to noon on **Friday, June 30th.**

For further information apply to

BOWMAN & CONNOR, Engineers,
24-25 36 Toronto Street, Toronto.
J. PAGET,
Thornhill, Ont.

Tenders

will be received to **June 28th instant** by the undersigned to make about 20,000 feet of Cement Sidewalk in the Village of New Hamburg, three-inch concrete 1 to 8—and 1-inch finish 1 to 2.

The lowest or any tender not necessarily accepted.

WILLIAM [illegible]AR.
Clerk.
New Hamburg, June 14, 1911.

Tenders

Sealed tenders addressed to the undersigned and endorsed "Tenders for Pipe, Trenches, etc.," will be received until noon of **Wednesday, the 28th day of June,** instant, for the excavating, laying and refilling of about 17,200 feet of eight-inch cast iron water pipes, for Lachute Waterworks.

Specifications prepared by William Kennedy, Jr., C.E., may be obtained from the undersigned on application.

JAMES W. RAITT,
Secretary-Treasurer.
Lachute Town, P.Q.
Lachute, June, 15, 1911. 25-25

Tenders

will be received by J. F. C. Menlove, Town Clerk of Virden until 6 p.m., **Friday, June 30th,** for all the work in connection with the erection of a municipal building to be used for court room, offices and opera house, size 60 x 107, two stories and basement, to be of brick on concrete foundation.

Each tender must be accompanied by a marked cheque of $600.

Lowest or any tender not necessarily [illegible]

Plans and specifications may be seen at the office of W. A. Elliott, Architect, Brandon, and with the undersigned.

J. F. C. MENLOVE,
[illegible]
25-25 [illegible]

Contractors' Material

IN CANADA

[illegible] 14 feet. Overhauled.

[illegible]

Ingersoll "Little Giant" Rock Drill, No. $3\frac{1}{4}$, [illegible]

[illegible]

6 x 4 American Steam Pump, Valve, piping and [illegible]

[illegible]

CITY OF TORONTO

Tenders

For the

Construction of a Seawall

In Lake Ontario, in the Vicinity of the Exhibition Grounds.

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on **Monday, July 3rd, 1911,** for the construction of a Seawall in the vicinity of the Exhibition [illegible]

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained on application to the Department of Railways and Bridges, City Engineer's Office, Toronto.

The tenderers shall submit with their tenders the names of two sureties (approved of by the City Treasurer not members of the City Council, or Officers of the Corporation of the City of Toronto), or in lieu of said sureties the bond of a guarantee company, approved of as aforesaid.

The lowest or any tender not necessarily accepted.

F. S. SPENSE,
Chairman of the Board of Control.
City Hall, Toronto,
June 14, 1911. 25-26

TOWN OF WALKERVILLE

Tenders for Sidewalks

Sealed tenders will be received by registered post, addressed to the undersigned up to noon on **Monday, the 3rd day of July, A.D. 1911,** for the construction of pavements in the Town of Walkerville, as follows:—

Concrete pavement and concrete curb on Brant street from Kildare road to Argyle road.

Tuscarora street from Devonshire road to Victoria road.

Cataraqui street from Devonshire road to West Town line limit.

Cedar block pavement and concrete curb approaches to overhead bridge on Grand Trunk Railway from Devonshire road to Victoria road.

Niagara street from Kildare road to West Town Line limit.

Asphalt Block Pavement.

Victoria road from Sandwich street to Assumption street, repaving with Asphalt Block.

Walker road from Sandwich street to Canadian Bridge Works.

Monmouth road from Wyandotte street to Niagara street.

Argyle road from Grand Trunk Railway to Niagara street.

Kildare road from Cataraqui street to Niagara [illegible]

Victoria road from Assumption to Wyandotte.

Sandwich street from Devonshire road to East Town Line limit.

Tuscarora street from Walker road to Devonshire road.

Cataraqui street from Walker road to Devonshire road.

St. Mary's Gate from Argyle road to Kildare [illegible]

[illegible] cation to Owen McKay, C.E., Walkerville, Ont.

[illegible]

Should any party whose tender is accepted fail to execute the necessary contract and bond [illegible] will be forfeited to the Town.

[illegible]

The lowest or any tender not necessarily accepted, the names of two responsible persons will [illegible]

[illegible]

Notice to Contractors

Township of Blanshard

Sealed tenders addressed to the undersigned will be received up till 5 o'clock p.m., **Saturday July 1st**, for the construction of the Youngson Creek Drain in the Township of Blanshard. Plans, profiles and specifications of said Drain can be seen at Clerk's Office at Rannoch in the said Township. A marked cheque for ten per cent. of contract must accompany each tender. The lowest or any tender not necessarily accepted.

JNO. H. JAMESON,
25-26 Clerk, Township of Blanshard.

Notice to Contractors

The time for receiving tenders for the laying of between three thousand and three thousand five hundred feet of rivetted steel pipe, six feet pipe, six feet in diameter, in Lake Ontario, for the Waterworks Department, has been extended to **Monday, July 3rd, 1911**, 12 o'clock noon.

Specifications and forms of tender may be obtained at the office of the City Engineer, Toronto.

F. S. SPENCE (Acting Mayor),
Chairman Board of Control.

City Hall, Toronto,
June 15th, 1911. 25-25

Department of Railways & Canals, Canada

Soulanges Canal.

NOTICE TO CONTRACTORS

Sealed tenders addressed to the undersigned and endorsed "Tender for Protection Works," will be received at this office until sixteen o'clock on **Tuesday, June 27th, 1911**.

Plans, specifications and form of contract to be entered into can be seen on and after the 9th instant, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Superintending Engineer of the Quebec Canals, 2 Place d'Armes, Montreal, Que., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $8,000 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, June 9th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 25-25

TO CONTRACTORS

Sealed tenders will be received for all trades required in the erection of an office building in King street, up to noon on June 30th, 1911.

The lowest or any tender not necessarily accepted.

F. S. BAKER, Architect,
Traders Bank Building,
25-26 Toronto, Ont.

CITY OF MOOSE JAW

Saskatchewan

TENDERS

Sealed tenders addressed to the undersigned City Clerk will be received in the Council Chamber, Moose Jaw, up to 8.30 p.m. on **Monday, July 24th, 1911**, for the supply of the following electrical apparatus:—

Contract A.

Fifty 6.6 Ampere, Direct Current, series, Metallic flame arc lamps, complete with globes, etc.
Fifty Absolute cut-out hangers.
One Current Regulator, 50 lamp circuit.
One Mercury Rectifier, 50 lamp circuit.
One Control panel with switches, 50 lamp circuit.

Contract B.

Fifty ornamental arc lamp standards.
Full particulars and specifications may be obtained from J. D. Peters, Electrical Superintendent, Moose Jaw, Sask.
The lowest or any tender not necessarily accepted.

W. F. HEAL,
25-27 City Clerk.

Sealed tenders addressed to the undersigned, and endorsed "Tender for Harbour Works in Courtenay Bay, St. John, N.B.," will be received until 4 p.m., on **Thursday, August 10th, 1911**, for the construction of a Breakwater, Wharves, for the Dredging of a channel and basin, and for the Filling shown on plan and also for the Construction of a Dry Dock and Ship Repairing Plant of the First Class under "The Dry Docks Subsidies Act, 1910.

Plans, specification and form of contract can be seen and forms of tender obtained at this Department, at the offices of E. T. P. Shewen, Esq., District Engineer, St. John, N.B.; J. K. Scammell, Esq., District Engineer, St. John, N.B.; C. E. W. Dodwell, Esq., District Engineer, Halifax, N.S.; A. R. Decary, Esq., District Engineer, Post Office, Quebec, Que.; J. L. Michaud, Esq., District Engineer, Merchant's Bank Building, St. James Street, Montreal, Que.; J. G. Sing, Esq., District Engineer, Confederation Life Building, Toronto, Ont.; H. J. Lamb, Esq., District Engineer, London, Ont.; and at the office of the High Commissioner for Canada, London, Eng.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature of the occupation and place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, payable to the order of the Honourable the Minister of Public Works, for the sum of five hundred thousand dollars ($500,000), which will be forfeited if the person tendering decline to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,
R. C. DESROCHERS,
Secretary.

Department of Public Works,
Ottawa, June 9, 1911.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 25-26

Plans Wanted

Competitive designs will be received by the undersigned up to and including **July 5th, 1911**, for a skating and hockey rink, size of ice space 75 x 180 feet, and seating capacity to be not less than 2,500, building to cost approximately $7,000. Plans to remain the property of the designer, same to be returned to the unsuccessful competitors.

Two and one-half per cent. will be paid to the architect whose designs aer accepted, for working plans and specifications.

R. C. MACFARLANE, Secretary,
Niagara Falls Hockey & Athletic Club, Ltd.,
25-26 Niagara Falls, Ont.

TOWN OF WELLAND

Street Paving

Sealed tenders, Envelopes must be plainly marked on the outside, the contents, Tenders will be received until 12 o'clock noon on **Driday, the 30th day of June next**, for paving the following street in the Town of Welland.

East Main street from Hellems avenue to Muir street.

Muir street from East Main street to Division street.

West Main street from Canal Bridge to Frazer street.

Tenders are invited for Asphalt Block, Vitrified Brick, Taralithic and Bitulithic, with brick between car tracks and extending 18 inches on the outside rails, on 6-inch Concrete Foundations.

Proprietors of patented pavements are requested to furnish their special specifications.

An accepted bank cheque for $1,000 must accompany each bid.

The lowest or any tender not necessarily accepted.

Further particulars can be obtained from Town Engineer's office.

GEORGE R. BOYD,
Town Clerk.

Town Clerk's Office,
Welland, June 12, 1911. 25-25

St. Catharine's Water Works

Tenders

Sealed tenders addressed to "The Chairman of the Commission," marked "Tender for Pipe Laying," or "Tender for Tunnel," will be recieved up to noon on **Thursday, July 13th, 1911**, for

Section "A."

4,200 lineal feet Rock Tunnel, 5 ft. x 8 ft.

Section "B."

Excavation and pipe laying 5,000 ft. 24 in. and 30 in. cast iron pipe. 36 in. cast iron intake pipe. Concrete intake and Valve Chambers. Building auxiliary reservoir.

Section "C."

Excavation and pipe laying 15,000 ft. 24 in. cast iron pipe.

Specifications and plans may be seen and forms of tender obtained at the office of the Waterworks Commission, City Building, James street.

The Commission reserves the right to reject any or all tenders, or to accept any tender which shall appear in its interest.

ALEX. MILNE,
Superintendent.

St. Catharines, Ont.
June 17th, 1911. 25-26

Bridge Tenders

Alternative tenders will be received by the Clerk of Markham Township, Unionville, Ont., for the building of a steel superstructure with concrete abutments, or a concrete arch in the Township of Markham, near Thornhill, up to 9.30 on **Friday, June 30th.**

For further information apply to

BOWMAN & CONNOR, Engineers,
36 Toronto Street, Toronto
24-25 J. PAGET, Thornhill, Ont.

For Sale

Steam and Electric Machinery displaced by Niagara Power. One 125 horse power, one 225 Compound Condensing Wheelock Engines in good condition. Boilers, 14 ft. x 60 in. and 12 ft. x 48 in. complete with iron work and steam connection. Condensers, heaters, belt tighteners, pulleys and shafting. Direct Current Electric Dynamos and Motors from one to eighty horse power. Bargain prices. Write for particulars.

W. R. REYNOLDS,
Supt., Power & Light Commission,
25-27 Ingersoll, Ont.

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

Position Wanted

Englishman wants job in Building Trades, twenty years experience, used to handling large quantities of men. Can prepare plans, specifications and estimates for all classes of work, up to date Sanitary Engineer, good references; age 37 years. Apply Box 288, Contract Record, Toronto, Ont. 25 25

Positions Vacant

Stone Masons Wanted—A few good stone masons wanted, to build random Ashler stone work, required at the building of a Parish Hall, for All Saints Church, Collingwood, Ontario. Apply Philip C. Palin, Architect, Collingwood, Ont. 25-26

Residences

(Continued from page 59)

Tenders to be called for residence, $9,000. Owner, Mr. Humphrey, Toronto; architect, Curry & Sparling, Toronto; 2½ storeys, brick and stone, 86x38, brick foundation, hot water heating, gas and electric light, slate roof, interior finish hardwood. Tenders called shortly. 268 Dovercourt road, Toronto; architect, P. H. Finney, 437 Victoria street, Toronto; brick and stone, stone foundation, hot air heating, combination lighting, felt and gravel roof, 2 storey, 31x 20. Owner will build shortly by day labor.

Tenders called for residence on Danforth avenue, $8,000. Owner, P. H. Lambert, 97 Anne street, Toronto; architect, A. Trainer, Grace street, Toronto; brick and stone, stone foundation, hot air heating, felt and gravel roofing, gas lighting, 2 storey 30x36. Tenders are called and will close June 20th.

Tenders called for residence, $12,000, (Indian and Bedford roads). Owner, I Everist, Gwynne avenue; architects, Gordon & Helliwell, Confederation Life Building, Toronto; brick and stone (cut) stone foundation, hot water heating, gas and electric lighting, slate roofing, modern plumbing, structural iron, skylights, mantels, 2½ storeys, 58 ft. 3 in. x33 ft. 2 in. Tenders received after June 13, close June 17th.

Contemplated residence, $40,000, north Toronto. Owner, W. M. Boultbee, York Mills, Ont; architect, H. S. Townsend, 15 Gerrard street east, Toronto; brick and stone, stone foundation, Slate roofing, 2½ storeys. Plans have not been started.

Tenders called for residence, $8,000. Owner, Mrs. Armour, Toronto; architect, J. F. Page, Confederation Life Bldg., Toronto; 2½ storeys, 30 x 40, brick construction, brick foundation, hot water heating, electric lighting, shingle roofing, hardwood interior finish. Tenders called until June 21.

Plans prepared for residences, $6,400. Owner and builder, R. Larkin, 81 Hogarth avenue; rough cast and brick front, brick foundation, hot air heating, gas and electric lighting, modern plumbing, felt and gravel roofing, 2 storey 38 x 32 ft. 6 in. Building will commence in a few days.

Tenders to be called for residence, $6,500, (42 Silver Birch avenue). Owner, J. D. Lea, Sherbourne street; brick, stone foundation, hot water heating, electric lighting, slate roof, hardware interior finish, 2½ storeys, 56 x 32. Tenders called in about 10 days by Aldridge & Son, the masonry contractors for balance of work.

Plans prepared for residences, $4,500, pr. semi-detatched, Ellerbeck avenue. Owner, architect and builder, W. W. Hiltz, 682 Broadview avenue; brick and stone, stone foundation, hot-air heating, combination lighting, felt and gravel roof, 2½ storey 40 x 33. Owner will build shortly by day labor.

Tenders to be called for store and apparatus, $4,000, (Wellesley and Bleeker streets). Owner, W. T. Tidy, Wellesley street; architect and builder, A. E. Cale, 91 Bleeker street; brick and stone, stone foundation, hot water heating, gas and electric lighting, felt and gravel roof, maple flooring; 2 storeys 18 ft. 9 in. x 54. Tenders will be called shortly for everything but carpenter work.

Heating required for garage, $4,000, (157 Sherbourne street). Owner, W. C. Bailey, King Edward hotel; architect, W. C. Bailey, King Edward Hotel; brick, concrete foundation, felt and gravel roofing, 2 storey. Building will commence in a few daws. Heating contract not yet let.

CONTRACTS AWARDED

Montreal, Que.

Residence, $[illegible],000, Pine avenue. Owner, architect and general contractor, H. C. Hitch, Coristine Building, Montread; 2 storey, stone front brick, 25 x 50

Residence, $25,000, Island street near Centre. Owners, Catholic School Commissioners, Montreal; architect, Joseph Sawyer, 407 Guy street; contractors—stone work, Fillon Freres; brick work, S. Marchesault, 8 Pacific avenue; carpentry, Lamarre Freres, 596 St. Patrick street; painting and glazing, J. Guy, 325 Workman; plastering, A. Cusson, 40 Laporte avenue; roofing, etc., T. Lessarb & Sons, Ltd., 191 Craig east, all of Montreal.

9 dwellings, $12,000, (Christopbe Colombe street). Owner, architect and general contractor, P. J. Charlebois, 1234 St. Hubert street, Montreal; 3 storeys, brick and wood, 75 ft. frontage x 40 ft. deep.

Shediac, N.B.

Addition to New Sherbrooke House, $15,000 (Depot street). Owner H. Higgins, St. Johnsbury Vt.; architect, C. E. White, Sherbrooke, Que.; 1 storey added. Brick, 80x40; general contract let June 8 to Sherbrooke Construction Co. Building to be completed Aug. 20th.

Shediac, N. B.

Residence, $16,000. Owner, R.C. Tait, Shediac, N. B.; architect, H. H. Mott, St. John, N. B.; 2 storeys 50 x 100; general contractor, Arthur P. LaBlanc, Moncton, N. B. Heating and plumbing awarded to Hagen & Co., Amherst, N.S.

Toronto, Ont.

Residence. Owner, D. G. Anderson, 95 Westmoreland ave., Toronto; architect, W. Belfry, Victoria street; general contractor, R. C. Cummings, 1684 Dundas street, Toronto; brick and stone, 32 x24, 2 storey.

Business Buildings and Industrial Plants

Brantford, Ont.

Manufacturing plant, $60,000. Owner, Waterous Engine Works Co., Brantford; general contractors, Schultz Bros., Brantford; iron work, Hamilton Bridge Works, Hamilton. Construction, brick, galleries and floors, reinforced concrete, 110 x 240, 1 storey and gallery; heating contract not let yet. General contract let June 12th. Building to be completed Sept. 1st. Foundation already in.

Calgary, Alta.

Tenders called for Bank—alterations and additions. Owner, Bank of Nova Scotia, Eighth avenue, Calgary. architects, F. J. Lawson, Norman Block Calgary. Plans, etc., at office of the architect. Contractor to furnish marked check for 5 per cent. of amount of tender. Tenders received until June 27th, by architect.

Edmonton, Alta.

Tenders called for business block, $50,000. Owner, Hart Bros., Edmonton; architect, H. A. MaGoon, cor. Jasper street and 3rd street; supply of triangular mesh reinforcing steel for concrete floors required. Tenders received by H. A. Magoon until June 20th.

Building in progress for cold storage plant, $75,000. Owner, Swift Canadian Co., Edmonton; concrete reinforced, concrete foundation, tar and gravel roof; 2 storey planned for, brick, electrical work, refrigerator. Four more storeys may be added later.

Hamilton, Ont.

Store, $6,000. Owner, E. Ruddy, Hamilton; architects, W. A. Edwards, 7 Hughson street, Hamilton; general contractor, Geo. Mills & Evans, Hamilton. Masonry, carpentry, cement and plastering let to Mills & Evans. Plumbing, sheet metal, iron work and stone work to be let.

Tenders called for two stores, $6,000 Owner, J. Morrow, Hamilton; architect, Stewart McPhie, Hamilton; brick, concrete foundation, steam heating, electric lighting, 2 storey shingle roof, cut stone, structural iron, plate glass. Permit granted. Tenders received after 10 days

London, Ont.

Tenders called for factory, $7,000, York street. Owner, Spring Bed & Mattress Co., York street, London; architect, Watt & Blackwell, 54 Bank of Toronto Chambers, London; 3 storeys, [illegible] brick and metal, steam heating, electrical work, composition roof, freight elevators, structural iron, vaults, fireproofing, asbestos materials. Heated by steam from another plant. Tenders received until June 22.

Tenders called for storage building, $3,000, York street. Owner, Spring, Bed & Mattress Co., York street, London; architect, Watt & Blackwell, Bank of Toronto, London; two storeys, 40 x 32, brick and metal, cement and brick, steam heating, electric lighting, shingle roof. Tenders called until June 26.

Montreal, Que.

Tenders called for terra cotta plant, $150,000. Owners, Montreal Terra Cotta Lumber Co. Location, at Lakeside near Montreal; kilns, machinery and dryers required. Bids will be called for kilns at once. Received at 26 Board of Trade Building, Montreal.

Tenders to be called for theatre and stores, $155,000. Owner, J. A. E. Gauvin, 850 St. Catherine E., Montreal. Architect, C. Bernier, 70 St. James street, Montreal; brick and stone, 85 x 126 5 storeys, capacity 1,250; 3 stores in front; offices and light manufacturing plants over them.

Niagara Falls, Ont.

Equipment required for manufacturing plant. Owner, Beaver Manufacturing Co., Niagara Falls, Ont. Manager, W. E. Jennings, Niagara Falls, Ont. Tin box machinery. Apparatus required at once.

North Battleford, Sask.

Tenders called for bank. Owner, Imperial Bank of Canada, N. Battleford; architects, Barnes & Gibbs, Imperial Bank Building, Edmonton. Plans, etc., at bank, offices of the architects, and at Builders Exchange, Sask. Tenders received by architects until noon June 19.

Orangeville, Ont.

Destroyed by fire—business building, $60,000. Owner, Hurndall Novelty Furniture Co., Orangeville; 3 storey 55x111, wing 45x55, engine house 28x30, 2 storey.

Oshawa, Ont.

Equipment required for business building. Owners, Queen City Oil Co., Bay street, Toronto, general manager, S. Rogers; engineer, S. Jackson. Equipment to be installed, 4 steel oil tanks, 11.5 ft. diameter, 20 ft. high. Construction of storage plant and stables to commence within one week by day work.

Revelstoke, B. C.

Sawmill burnt—loss $40,000. Owners, Bowman Lumber Co., subsidiary comp. of Dominion Sawmills & Lumber Co., Ltd. Mill and plant entirely gutted. 600,000 feet storage logs burnt. Loss covered by insurance. Questionable whether they will rebuild.

St. John, N. B.

Tenders called for addition to brush factory. Owners, T. S. Simm & Co., St. John; architect, F. Neil Brodie, St. John, N. B., power house, boiler house, and machine shop 48 x 55. Tenders to be called this week.

Sherbrooke, Que.

Plans in progress for store, $12,000. Owner, P. T. Legaru Sons, Que.; architect, J. W. Gregoire, Sherbrooke; 2 storeys, brick and stone, 60x100, stone foundation, electric light. Tenders received after July 1st. Time to close not fixed yet.

Sackville, N. B.

Specifications completed for addition to foundry. Owner, Emerson & Fisher, St. John, N. B.; small addition to plant of Enterprise Foundry Co., at Sackville, N. B. Tenders called shortly.

Toronto, Ont.

Tenders called for factory, (Symington avenue). Owner, W. D. Beath & Son, 193 Terauley street, Toronto; architect, and builder, W. Siddall, 75 Yonge street, Toronto; steel and concrete, concrete foundation, electric lighting, concrete, felt and gravel roof, 1 storey 130x52, fireproof doors. Structural iron and 2,200 ft. metal sash and wire glass required. Tenders close June 20th.

Tenders called for stores, $3,500 (Gerrard and Erie). Owner, H. B. Bishopric, 61 Heath street; architect and builder, J. L. Hill, 154 Wheeler avenue, Toronto; 2 storey, frame, concrete foundation, hot air heating, gas and electric light, tar and gravel roof, 53 ft. 9 in. x 26. Tenders called for all but carpentering about June 16th.

Tenders called for warehouse, $40,000, Bay and Wellington. Owner, W. R. Brock Co., Ltd., Wellington street, Toronto; architect, A. R. Denison & Stephenson, 20 King street west, Toronto; 4 storeys and basement, 108 ft. 8 in. by 49 ft. 1 in., brick, stone foundation, steam heating, felt and gravel roof, structural iron, skylights, metallic lath, Tenders received until June 20, by the architect.

Mr. Percival R. Moses, E.E., 366 Fifth avenue, New York, has been retained as consulting engineer for a large departmental store, and desires to specify British or Canadian materials. He is open to receive information and catalogues relating to the following: marine type boilers, 250 h.p. each; ventilating fans (Sirocco and propeller types); air washers; tempering coils; w. i. pipe; heating system (vac. return); caskets; valves (globe and gate for 125 lbs. and for pressure and radiators) (relief valves); steam transformers; insulating covering; registers and register faces; automatic pump control; mtoors; steam pumps; back pressure valve; grease separator and return tank; hot water heater; reducing valve; blow-off tank; steam separators; pump governor; water weigher; damper regulator; exhaust head; oil cabinet; absorption type refrigerating plant (operative by exhaust steam at 15 pounds or less pressure with condensing water 70 deg. or less); mechanical stokers for bituminous coal; fire brick; dynamo (300 kilowatt, 110 volt, direct connected, 150 r.p.m. (3)); switch and control panels and panel boxes; storage battery (140 amperes, 8 hours, 110 volts) for equalizing elevator demand and for some night lighting; push switches; conduit and outlet boxes; receptacles; telephones; show window reflectors; time and watchman's clock system; fire alarm; 500 h.p. moderate speed Corliss valve engines (3); vacuum cleaning machine; arc lamps; tungsten and carbon filament bulbs; hose for fire system and for vacuum cleaning system; sprinkler heads and system; air compressors; toilets; lavatories; urinals; drainage pipe and fittings; water meters.

Victoria, B. C.

Tenders called for office building. Owner, Dominion Trust Co., 328 Hastings street, Vancouver, B. C.; architect, H. S. Griffith, Dom. Tr. Bldg., Vancouver, B. C.; general contractor, N. Griffiths Steel Construction Co., 198 Hastings street west, Vancouver, B. C. Tenders on the sub-contracts for building to be erected in Victoria will be let shortly.

CONTRACTS AWARDED

Brantford, Ont.

Factory warehouse. Owner, Massey-Harris Co., Brantford; cotractor for foundation, A. J. Cromar, Brantford; concrete foundation, 162 x 66, basement, about 400 cubic yards of concrete. Contract let June 13th. Building to be completed July 15th.

Hamilton, Ont.

Factory, $100,000. Owner Underground Cable Co., Pittsburgh, Pa.; achitects, Prack & Sons, Welland, Ont. brick, concrete, steam heating, electric light, tar and gravel roof, 3 storeys 100x 250, fire escapes, steel beams iron columns, structural iron, fireproof doors, freight elevator. Tenders closed June 14th.

Moose Jaw, Sask.

Printing shop, $25,000. Owner, Times Printing Co., Ltd., Moose Jaw; architect, Storey & Van Egmond, Regina; 3 storeys mill construction; general contractor, Peter Lyall & Co., Montreal. No information as to sub-contractors. Report later.

Office and warehouse, $20,000. Owner, Massey-Harris Co., Ltd., Regina; architect, R. G. Bunyard, Moose Jaw, 3 storeys and basement, brick and stone, 28x 98. General contractor, A. B. Fleming, Regina, Sask, awarded June 6. 1911.

Medicine Hat, Alta.

Furniture store, $23,000. Owner, Beveridge Furniture Co., Medicine Hat; architect, W. T. Williams, Medicine Hat; 2½ storeys, brick and stone, 44 x130. General contractor, A. P. Burns, Mericine Hat. Building to be completed October 1.

Office building. Owners, News Publishing Co., Medicine Hat; architect, W. T. Williams, Medincine Hat; 2 storey, brick and stone, 50x50. General contractor, Hotson & Leadie, Medicine Hat. Building to be completed Oct. 1.

Montreal, Que.

Warehouse, $16,000. Owners, The Star Publishing Co., St. James street, Montreal; architect, McVicar & Heriot, Montreal. General contractor, Reid, McGregor & Reid, Crescent and St. Cathenine street west.

4 stores, $60,000. Owner, Mrs. D. E. Dorvil, 859 Tupper street, Montreal; architects, McDawell & Henderson.

MacLean Daily Reports

The only systematic method yet devised for reporting BUILDING AND ENGINEERING projects from their inception to completion. Ask us for Rates and Specimen Reports.

220 King Street West - TORONTO

BOILERS

Fitzgibbon Type of Boilers built for McLachlin Bros., Arnprior, Ont.

BOILERS, of All Kinds for Any Service

"Inglis" Boilers are Designed and Built by Skilled and Experienced Workmen.

"Inglis" Boilers are Built of the Best Material that can be procured.

"Inglis" Boilers are Made in Shops Equipped with the Latest and Most Modern Machinery.

Workmanship, Quality, Quick Delivery and Fair Prices, together with Fifty-Two 52 Years' Practical Experience, have made "INGLIS" Boilers the "Standard." Write us for prices.

The John Inglis Company
Engineers and Boilermakers Limited
14 Strachan Ave., TORONTO, Canada

Grey street, Montreal; 4 storeys, brick and stone 75x110; general contractor, G. W. T. Nicholson, Eastern Townships Bank Building, Montreal. Subcontractors, carpentering, D. M. Long; plastering, R. D. Clark & Sons; heating and plumbing, D. A. Bethune; painting, Jno. Wilson; iron work, Phoenix Bridge Co. All firms in Montreal.

Bank, $[illegible] Mount Royal avenue E. Owner, Montreal City and District Savings; architect, A. H. Lapierre, 30 St. James street, Montreal; contractor, M. Huberdeau, 622 de Montigny, Montreal; brick and stone face, 26x52, 3 storey.

Business building, Craig street. Owner, The Herald Co., Ltd., St. James street, Montreal; architects, Brown & Vallance, St. James street, Montreal; General contractor, Bishop Construction Co., Montreal and Toronto.

Power Plants, Electricity and Telephones

Blyth, Ont.

By-law to be submitted for electric light steam pump, $5,000. Party interested, Village of Blyth; clerk, A. Elder, Blyth. By-law to be submitted on June 27th.

Edmonton, Alta.

By-law to be submitted for hydro-electric plant, $100,000. Owners, City of Edmonton, Alta; city engineer, A. J. Latornell, Alta., first of five yearly instalments of equal amounts to develop the Athabasca water power, estimated at 10,000 h.p. Government has granted the city the privilege of using the Grand Rapids, 190 miles north of city. By-law will be submitted on June 17th.

Earlswood P. O., Sask., via Wapella, Sask.

Tenders called for telephone system. Owner, Fairmeade Rural Telephone Co., Ltd. Chairman, W. G. Hodgins, sec.-treas., H. R. Dring, Earlswood. Construction of two circuits in rural telephone system, 23 miles (more or less). Completion by September 1st. All material and labor to be furnished by contractor. Tenders received by secretary-treasurer, Earlswood, until July 1st.

Hamilton, Ont.

Debenture by-law for municipal power plant, $502,878. Owner, City of Hamilton, Ont. By-law being prepared to be submitted to ratepayers for power to raise debentures for electric power and light municipal plant. Work will begin at once if by-law carries. Details of estimates of engineer furnished on request.

Moose Jaw, Sask.

Tenders called for supply of electrical apparatus. Owner, City of Moose Jaw, Sask.; W. F. Heal, city clerk; city engineer, J. M. Wilson. Contract A.—50 6.6 ampere, direct current series, metallic flame arc lamps, complete with globes, etc.; Contract B.—ornamental arc lamp standards. Full particulars obtained from J. D. Peters, electric superintendent, Moose Jaw. Tenders received by city clerk until 8.30 p.m. Advertisement in Tenders and For Sale Department of this issue.

Vernon, B.C.

Proceedings of council—new dynamo, $6,000. Clerk and treasurer, D. G. Tate, Vernon. Purchase of dynamo; by-law will be presented to ratepayers to carry out electric light extensions.

Wetaskiwin, Alta.

Machinery required for power plants. Engineer, Geo. Taylor, Wetaskiwin, Alta. Gas engine driving alternator; also air compressor, motor driven. Specifications mailed on application.

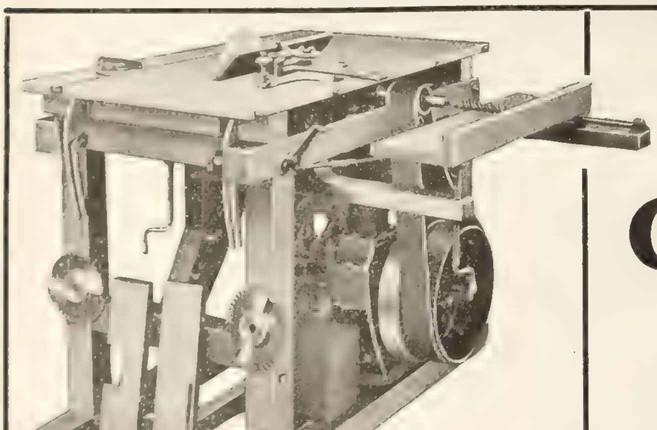
Windsor, Ont.

Business opportunity, power building for manufacturing; secretary board of trade, A. W. Jackson, Windsor; urgent demand for space; American manufactures starting in leased premises to test market, all available buildings in city now leased and more than a dozen companies seeking locations. Suitable building can be purchased with excellent arrangement for supplying power, or new building would be paying proposition. Detroit power buildings charging 30 cents a foot for space yearly and 5 cents per kilowatt hour for power. Address A. W. Jackson, for further information.

Miscellaneous

Windsor, Ont.

Contemplated, purchase of new fire equipment, $17,000. Owner, City of Windsor, Stephen Lusted, City Clerk; Ald. T. J. Eansor, chairman fire committee. Proposed new equipment, combination auto driven apparatus, 700 gallon capacity pump, chemical and hose, 80 horse power, combination auto driven apparatus, chemical and hose, 80 horse power, 1,000 feet of new house; hose repairing kit; smoke protector.



On Every Concrete Job

You can save 10 to 15 per cent by using our Contractor's Portable Saw and Variety Woodworker.

Now is the time when you are starting to do your concrete work and this saw will be just what you are looking for—a cheap practical saw that will prove itself a time saver and money maker for you.

CONTRACTORS SUPPLIES OF ALL KINDS

The Canadian Fairbanks Co., Limited

Fairbanks-Morse Gas Engines, Fairbanks Scales. Safes and Vaults.

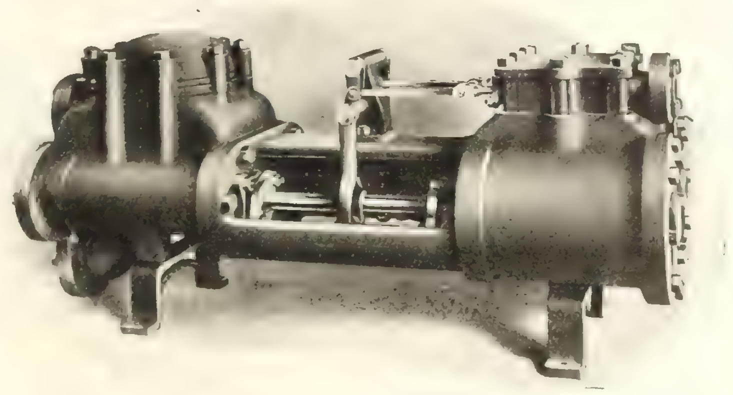
Montreal Winnipeg Toronto Vancouver
St. John, N.B. Calgary Saskatoon Ottawa

WHAT IT IS

A Rip Saw
A Matcher
A Mitre Saw
A Cut-Off Saw
A Dado Machine
A Jointer
A Boring Machine
A Gaining Machine
A Grooving Machine
A Rabbitting Machine
A Moulder with Self-Contained Power

BOILER FEED PUMPS

We have a large number of International Steam Pumps for boiler feeding purposes good up to 70 h.p. in stock ready for immediate shipment from our



WORKS: **512 WILLIAM STREET, MONTREAL**

THE JOHN McDOUGALL
CALEDONIAN IRON WORKS CO.
LIMITED

Contractors Please Note

For the building of such reinforced concrete work as floors, roofs, culverts, archways, sewers, tunnels, and other construction of similar character, no reinforcing is superior to

Greening's Wire Reinforcing

It is a woven mesh of hard drawn, double crimped steel wire made in any desired length or strength. It has proved eminently successful where ever it has been applied. Our big output of this and other wire goods enables us to quote the lowest prices obtainable, quality considered, and to assure you of prompt delivery of all orders. Let us give you our estimate.

Write us for Catalogue No. 5

The B. Greening Wire Company Ltd.
Hamilton, Ont. Montreal Que.

RAILWAY CONSTRUCTION PLANT

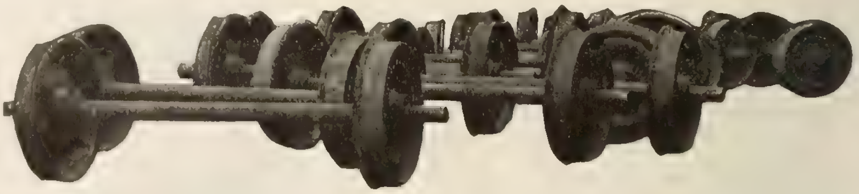
Hoisting Engines, Horse Powers, Hand Winches, Derricks, Car Wheels, Axles and Boxes, Dump Cars, Rail Cars, Buckets

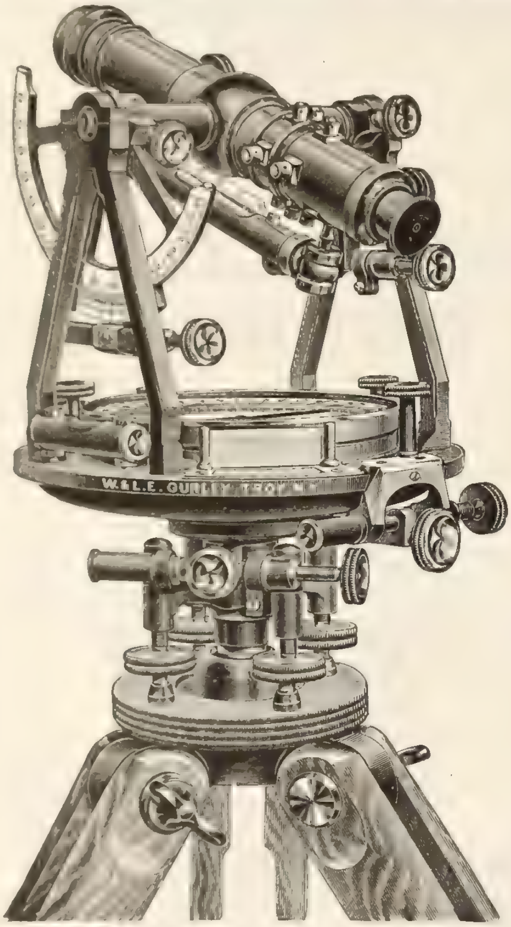
MARSH & HENTHORN, Limited

Makers of Hoisting Machinery, BELLEVILLE, ONT.

Send for Catalogue

SALES AGENTS
MUSSENS
LIMITED
Montreal, Que.




W. & L. E. GURLEY TROY

1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

Transits
Y Levels
Compasses
Plane Tables

Current Meters
Levelling Rods
Chains
Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited

Dundas - Ontario

Vault Doors and Safes

J. & J. Taylor

Toronto Safe Works

Established 1855 TORONTO

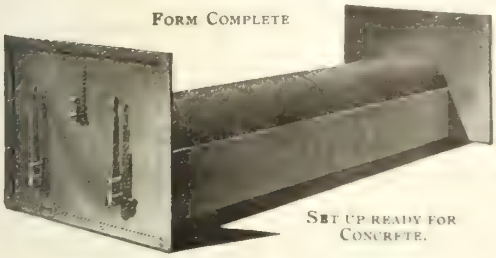
Branches: Vancouver and Winnipeg
Montreal

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.

Form Complete



Set up ready for Concrete.

Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

Write for Form Catalogue
Engine Catalogue for the asking
Commissioner's Time Book Free

Concrete Form & Engine Co.

Successor to Collapsible Steel Form Co.

83 Congress St. W., Detroit, Mich.

"Nothing is impossible to pains and patience, but it takes the best material to insure complete satisfaction."

—The Philosopher of Metal Town.

"METALLIC"

Rock Faced and Brick Siding

when in place cannot be distinguished from genuine brick or stone.

An economical, ornamental and durable siding for small houses, automobile garages, office and store fronts, etc.

"Manitoba" Steel Siding

for Elevators, Mills, Storehouses and Factories.

Made from the best quality galvanized or painted sheet steel; it is FIREPROOF and DURABLE, and presents a very neat appearance.

For further information, send for our new catalogue No. 70. Interesting information on Metallic Building Materials.

Manufacturers 1954

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

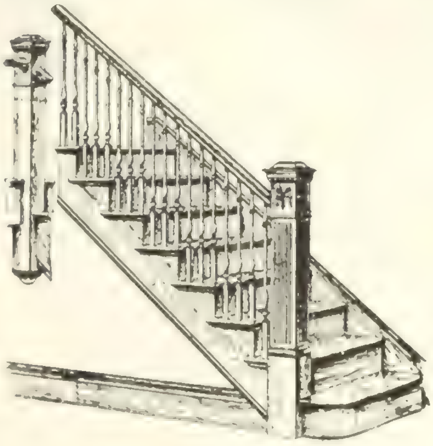
Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City



FOR

STAIR WORK

COME

TO US.

We make a specialty of this class of work and are sure we can please you if you give us a chance.

Pine and Hardwood, Veneer Doors and Interior Trim.

Bryan Manufacturing Co.

Limited

COLLINGWOOD, ONTARIO

A STRONG TESTIMONIAL

"Best Paving Block Made"

Quality is Economy
in Paving Brick

Kalamazoo, Michigan, U. S. A.,
June 13, 1910.

"We used Metropolitan Block in 1895 and the best recommend I can give is that we have used many more of them nearly every year since."

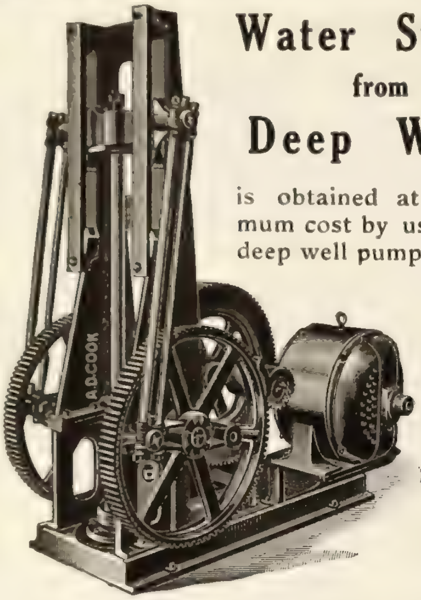
(Signed) H. A. Johnston,
City Engineer.

"Metropolitan Block"
Make Permanent Pavements

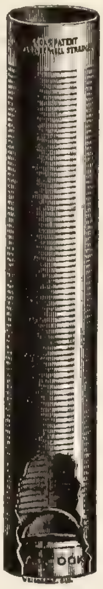
The Metropolitan Paving Brick Co. - Canton, Ohio

Water Supply
from
Deep Wells

is obtained at a minimum cost by use of our deep well pumps.



Write for Bulletin 26 explaining the use of Cook's Patent Brass Tube Well Strainer



A. D. COOK

Lawrenceburg, Indiana, U. S. A.

Manufacturer of a Complete line of **DEEP WELL SUPPLIES** including Steam, Belt and Motor Driven **DEEP WELL PUMPS**, Wind-mill and Hand Pumps, Working Barrels and Valves, Pump Rods and Pump Rod Joints, Drill Rods and Drill Rod Joints, Drilling and Well Tools.

Catalogue Mailed Upon Request.

PURE WATER

It is easy to obtain with our plants and apparatus

We design and contract for complete municipal filtration plants of any capacity.

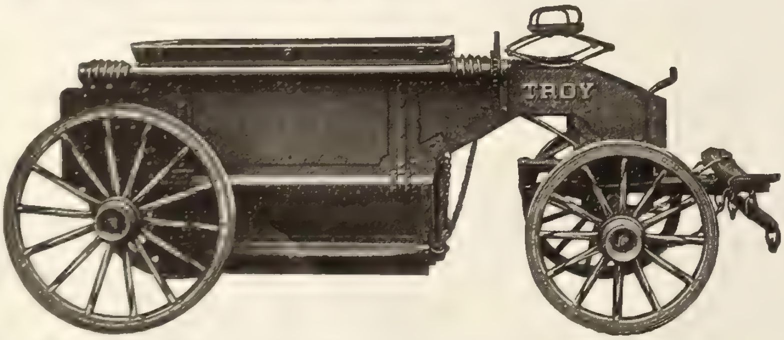
We supply and install apparatus for sterilizing water supplies by the application of calcium hypochlorite.

Literature, Sketches, Estimates and Recommendations Supplied on Request

American Water Softener Co.
1001 Chestnut St., PHILADELPHIA, Pa.

We have no affiliations or working acquirements with any of our competitors.

TIRED SHOVELERS CAN'T WORK FAST



Shoveling into a high dump wagon is an awful strain. It gets the best of the strongest man on these hot days.

If you want your shovellers to work as fast at 4 p.m. as at 9 a.m., get TROY Specials. They are low down—the 1½ yd. size is only 4 ft. 8½ in. from ground to the top of box. At the same time, it's coupled short to make it easy running—only 8 ft. 4 in.

Look at any other low down wagon—see how long it is. Look at any other short wagon—see how high it is. Then get a price on the Special—you will like it too. Get Catalog 22.

The Troy Wagon Works Co.
South Main Street, Troy, Ohio

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILE, CRESTINGS, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor

Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

Looking for Business

Then our DAILY REPORT SERVICE will help you. Our organization provides the only systematic method yet devised for reporting Building and Engineering projects from their inception to completion.

Special facilities for gathering news of sales opportunities in machinery, equipment and materials required.

Ask us for further information. Let us send you rates and specimen reports.

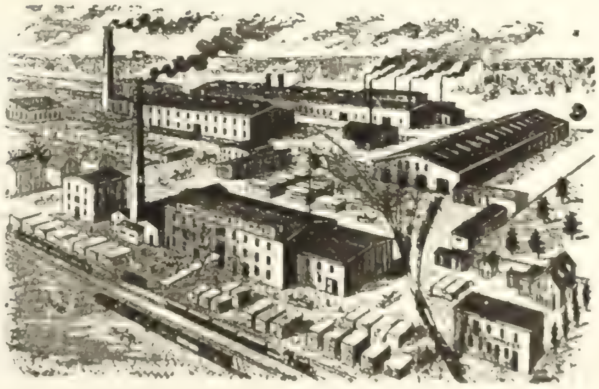
MacLean Daily Reports Limited

220 King St. West

TORONTO ONTARIO

Rhodes, Curry Co., Limited

Lessees



Bank and Office Fittings

SCHOOL DESKS A SPECIALTY

We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc.

In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

Rhodes, Curry Co., Ltd. Amherst, N. S.

BRANCHES AT

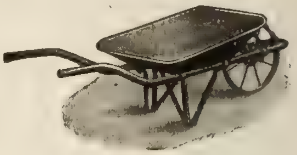
Halifax Sydney

The Meaford Wheelbarrow Co., Limited

MEAFORD, ONT.

Manufacturers of

Wheelbarrows of every description, for every purpose. If it is a Wheelbarrow you want we have it in Railroad or Navy, Steel Tray or all Steel, Garden or Lawn.



Wheel Scrapers, pressed bowl or square box in two sizes Nos. 2 and 3.

Drag Scrapers, pressed steel handles on top or sides, with or without runners.

Ox Shovels, Fresno or **Buck Scrapers**

Dump Carts, Dump Cars, Grading Ploughs

Trucks, Bag, Warehouse, Platform

Sterling line of Roller Bearing easy pushing Concrete Wheelbarrows and Carts

Write for prices and complete catalogue

THE MILTON PRESSED BRICK CO. LIMITED

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

We are Agents for the Fiske Tapestry Brick, suitable for high-class residential work At our Toronto Office we have set up panels of the different color schemes and would be pleased to have you call and examine them.

Head Office: Milton, Ont. Toronto Office: Janes Building

EADIE-DOUGLAS LIMITED, Ottawa Agents

Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

The Smith Marble and Construction Co., Ltd.

Montreal

Office & Factory:
145 Van Horn Ave.

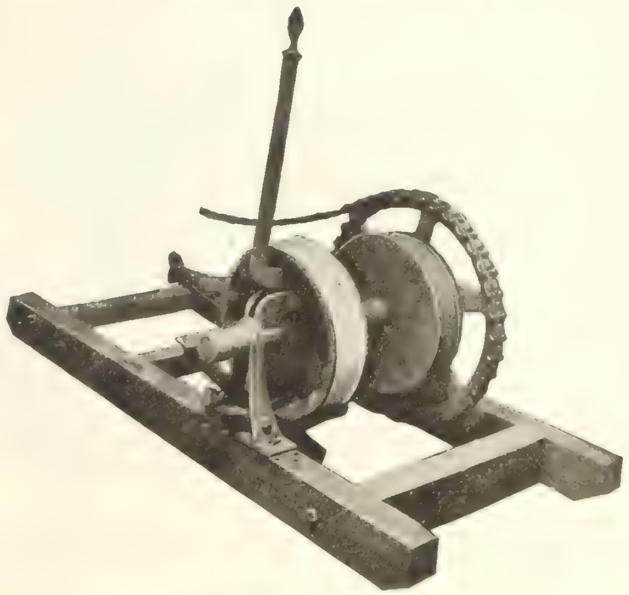
Show Rooms:
458 Blury Street

Importers, Manufacturers, Contractors

OF

Interior and Exterior Marble, Slate, Floor and Wall Tiles, Mosaics, Plumers and Electrical Marble, Granites for Building and Monumental Work.

DO YOU WANT A GOOD HOIST?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	**Mortar Conveying**	**Well Digging**
Bridge Building	**Sewer Building**	**Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists
London, Canada

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President
Thos. C. Irving Jr., Vice-Pres
Jas. W. Moffat, Secretary
Chas. Warnock, Treas. & Mgr.

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, Canadian Express Bldg., Montreal, Que.
Branch Offices, Traders Bank Bldg., Toronto, Ont.
Norfolk House, Laurence Pountney Hill, London, E.C.

Note tremendous metal weight on this floor. Entire building of Alsen's Cement reinforced concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

for concrete reinforcement is made from high carbon, cold drawn wire. The process of cold drawing eliminates the possibility of flaws. Perfection Wire Mesh is necessarily perfect.

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

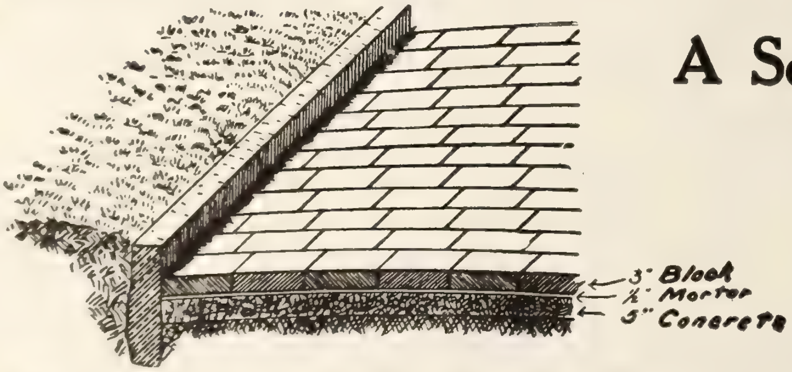
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by
Asphalt Block Pavements
Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Lap Welded Steel Pipe

MADE IN SIZES

12 to 72 inches Diameter

Used extensively for Water Supply for Mines, Mills, Hydraulic Operations and High Pressure Hydro Electric Installations.

Ask our Welded Pipe Dept. for prices.

American Spiral Pipe Works

MANUFACTURERS OF

SPIRAL RIVETED PIPE LAP WELDED PIPE
FORGED STEEL FLANGES

50 Church St. New York Box 485 Chicago, Ill.

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)

"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."

W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April [illegible]

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.

1032 Garfield Building, CLEVELAND, OHIO

SELLING AGENTS

The Dominion Equipment & Supply Co., Winnipeg, Canada

HOW ABOUT IT?

Just listen to the wonderful advantages of incorporating in your concrete.

Guelph Hydrated Lime

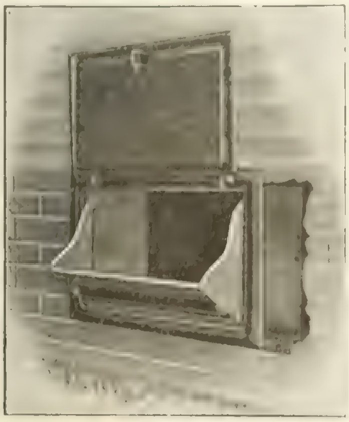
1. —The concrete works easier under the trowel
2. —It finishes easier.
3. —It improves the color of the finished work
4. —It makes the concrete more impervious to water
5. —It greatly improves the strength

The above are not five fancy ideas but five established facts.

Specify **Guelph Hydrated Lime** when ordering from your dealer

Standard White Lime Co.

Guelph - Ontario



EQUIP YOUR CELLAR

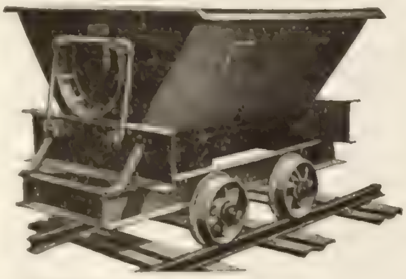
with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

[illegible]

The Down Draft Furnace Co., Limited

Galt, Ontario, Can.

CARS - BUCKETS - SCREENS



High Quality
Low Prices
Quick Shipments

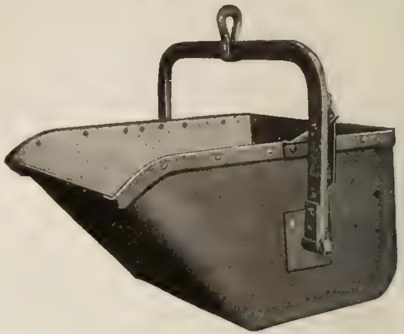
IF you require any equipment send for our Catalog No. 31-A which illustrates a complete line of this material.

¶ We make any kind of Car or Bucket you want for handling concrete—clay—stone—cement blocks or anything else.

Carry Standard Sizes in Stock

Write us — we can save you money

SACKETT - CHICAGO

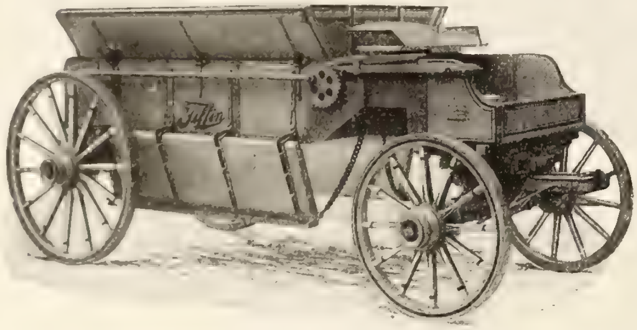


1691 Elston Ave., Chicago, Ill.

Tiffin Dump Wagons

Flushing Machines, Sprinklers
and Municipal Vehicles

are the best builded devices in the United States



The Tiffin Wagon Co.

TIFFIN, OHIO

CONCRETE

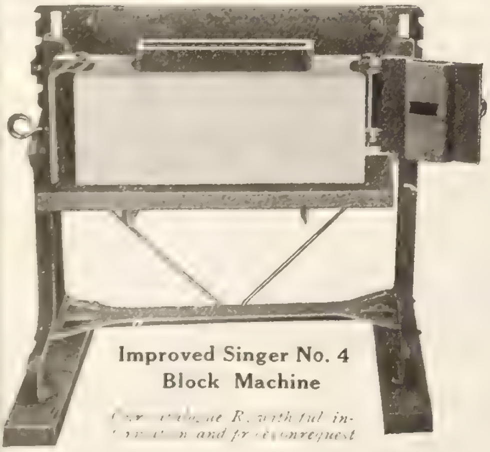
Culvert and Sewer Pipe

ARE you responsible for the construction and ultimate satisfaction of a sewer or culvert? The material for such work should be something that will last for ever. Concrete improves with age and will give permanent satisfaction.

If you compare "North" Concrete Culvert and Sewer Pipe with other makes you will use "North".

Ebenezer North Co.

LONDON, ONTARIO



Improved Singer No. 4
Block Machine

Our catalogue R, with full information and prices on request

It Makes

Face Down Blocks

Blocks 4", 6", 8" 10" 12", 16" and 20" long.
4", 6", 8", 10" and 12" wide.

All Blocks on One-size Pallet.

Sold in combination to suit purchaser at reasonable prices. Guaranteed against defect ve material or poor worknanship.

Vining Mfg. Co.
Niagara Falls, Ont.

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

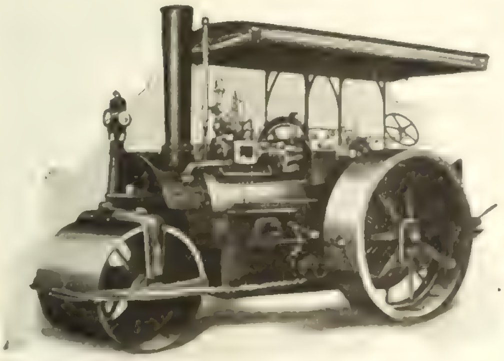
IRON STAIRS

Dennis Wire & Iron Works Co.
London, Canada Limited
Toronto Offices - 12 QUEEN STREET E.

Cut shows a four wheel steam Locomotive Crane with 40ft. boom handling forms on New York Catskill Aqueduct at Valhalla, N.Y. These contractors are finding our cranes indispensable in this work, as they can be used for so many purposes; such as handling loose materials as broken stone, sand, concrete, etc., heavy timbers, rails, concrete forms, etc.

THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND, OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City

There are over 100 Waterous Rollers in use in Canada to-day



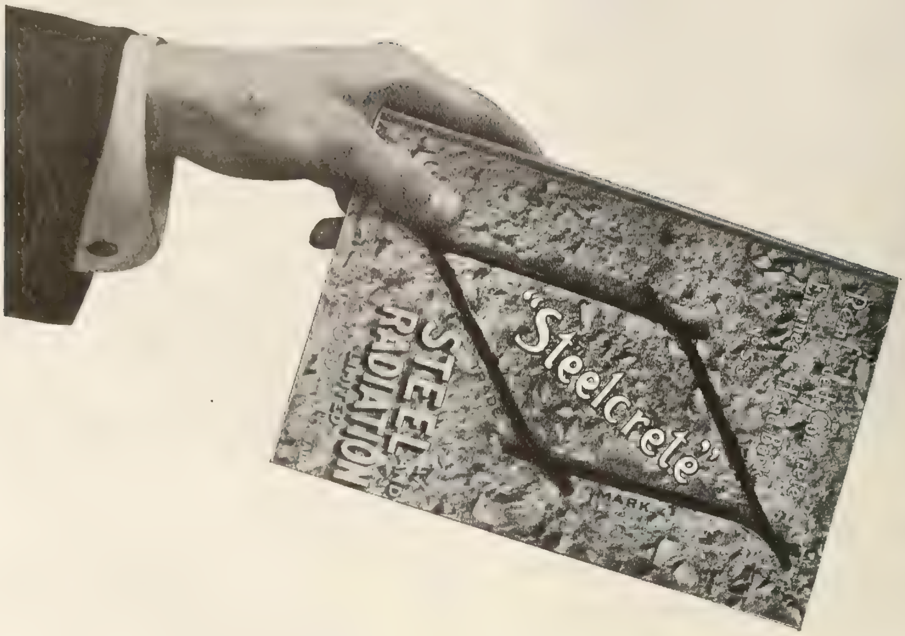
The Waterous Roller
"A Canadian Roller for Canadian Roads."

That means that there is at least one in use in every province in the Dominion, working on all kinds of roads, under all sorts of conditions. Their universal success proves their right to the title "The Canadian Good Roads Pioneer."

The Waterous Roller is built in three sizes, 10, 12 and 15 tons. Carries a double crank engine, a quick-steaming locomotive type boiler of large capacity has two speed gearing cut from the solid steel for fast and slow work. Supplied with all standard engine and boiler fittings.

If there is no Waterous Roller in your neighborhood, write for our complete Roller catalogue No. 301 or visit us at our Brantford works and see the Roller being build and tested—a practical demonstration that is its best selling argument.

The Waterous Engine Works Co., Limited
Brantford - Canada



This Book Free to

Builders, Architects, Engineers

Every man interested in the designing or building of Re-inforced Concrete of any kind should have a copy of this latest Hand-Book of ours.

It tells briefly, and without a confusing mass of technicalities, of the latest wrinkles in Re-inforced Concrete Beams, Floors, Roofs, Bridges, Culverts, Retaining Walls and Dams.

It also describes with profuse illustrations the construction of Fire-proof Partitions, Ceiling and Exterior Walls with re-inforced cementine or stucco.

If your copy sent to those on our mailing list, has not yet reached you, drop us a card for another.

Don't fail to consult us about any of your Re-infroced Concrete problems

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE—FRASER AVENUE

MONTREAL
138 CRAIG STREET WEST

Halifax—Room 13 Keith Bldg.
St. John—13 Germain St.
Quebec—153 St. Paul St.
Ottawa—83 Banks St.

Fort William—113 N. May St.
Winnipeg—334 Garry St.
Calgary—309-8th Avenue.
Vancouver—416 Pacific Bldg.

TENTS
for Engineers and Contractors

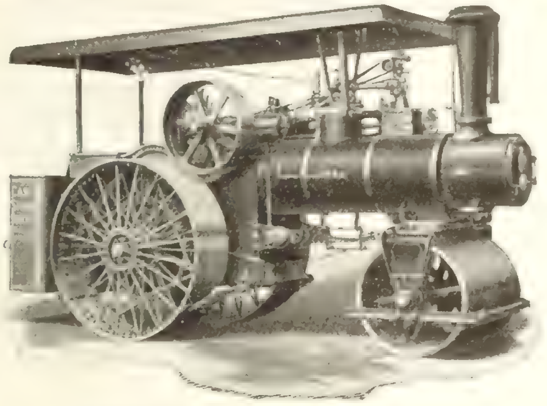
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

Woods Limited
Woods Building - Ottawa, Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT
THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18″ x 26″ cylinder Mogul, Standard Gauge, and 18-10″ x 14″ Vulcan and Davenport dinkeys, 36″ Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36″ Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8″ Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1 Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag-Scrapers an 4—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 18-36″ Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW
May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. and Dolland Lane - - MONTREAL, CANADA

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North 664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C. P. R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

RECIPROCITY

means to exchange. We have high quality fittings, you have good money. Lets get together.

S BRAND

Cast Iron Fittings and Valves are Right

"Everlasting" Blow-off Valve
SIMPLE — DURABLE — EFFICIENT

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

The
Missisquoi Marble Company
Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices :—

Eadie-Douglas, Ltd.	Toronto, Ont.
C. N. Barclay	Winnipeg Man.
Bosse & Banks	Quebec, Que.
General Contractors Supply Company, Ltd.	Halifax, N. S.
129 Sparks Street	Ottawa, Ont.
James Robertson Co. Ltd.	St. John, N. B.
G. R. Duncan	Fort William, Ont.
Walker & Barnes	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd.	Vancouver, B. C.
315 Coristine Building	Montreal, Que.

Everlasting Building Brick

GLENBOIG

Every Glenboig Brick bears the brand

GARTCOSH

GLENBOIG

Manufactured from the natural product without any sand. This makes a hard brick proof against destruction by time, tempest or climatic changes.

Specify "GLENBOIG" on your next job.

MAKER'S SELLING ACENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another.

Tide Water Iron Works
HOBOKEN, N.J. U.S.A.

Builders' Supplies

Mouldings
Turnings
"Empire Brand"
Hardwood Flooring
Stair Building
Interior Trim
Sash
Veneered Doors
Pine Doors

J. R. Eaton & Sons
Limited
Orillia, Ontario

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A.

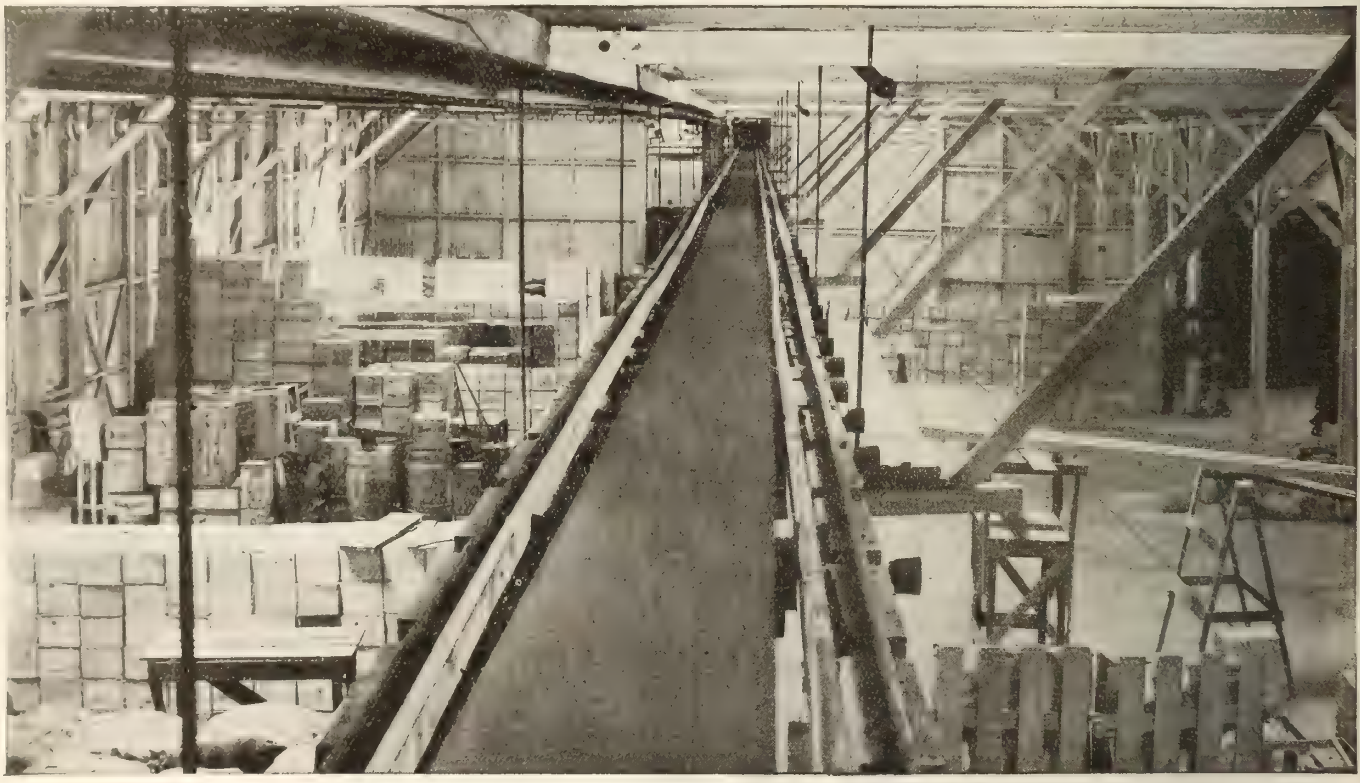
Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG



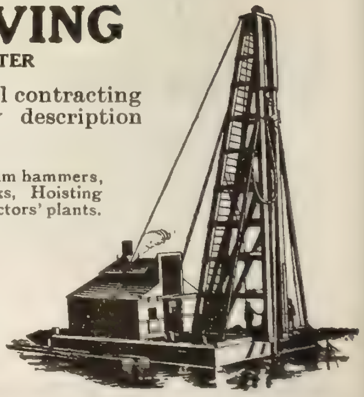
SCANDINAVIA CONVEYOR BELTING

Federal Engineering & Supplies, Toronto

THE
Thames Quarry Co.
St. Mary's, Ont.

CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.

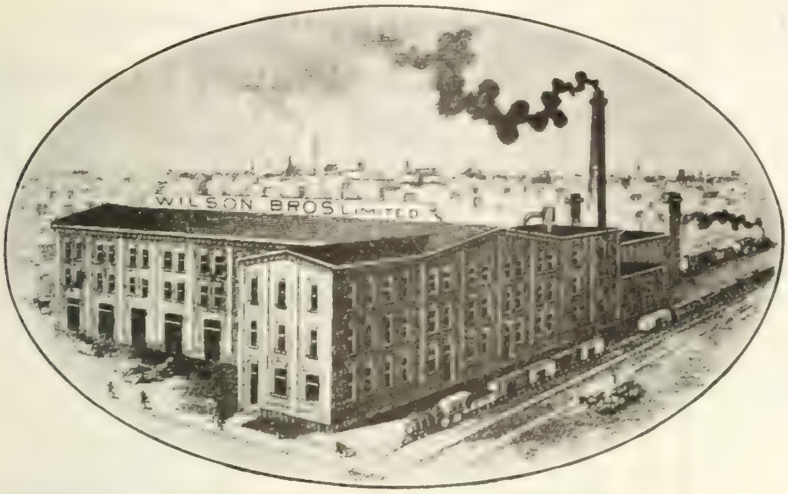


PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.



Hardwood Flooring and Interior Finish

"Wilson Bros. Limited" on flooring means a carefully kiln dried and well manufactured article. Our flooring is straightened, hollow-backed, bored, end-matched, steel polished and bundled. -:- -:- -:-

We specialize in Veneered Doors to detail.

Wilson Bros. Limited **COLLINGWOOD, ONT.**

The Mushroom System

Of Reinforced Concrete is strong, economical and durable. Based on scientific principles, every pound of steel does the work it is designed to do.

The system is fully covered by broad patents in Canada, the United States, and all civilized foreign countries.

For lists of buildings, descriptive literature and estimates, address

C. A. P. Turner, M. Am. Soc. C. E.
816 Phœnix Building, Minneapolis, Minn.

DOMINION BRIDGE CO.

LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co. Limited

Darlington, England

Bridges

and

Steel Structures

Canadian Offices:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

—Bridge and Construction Dep't.—

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter
River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS SUPPLIES

WATER WASHED SAND
OUR SPECIALTY

Dealers in
Sand and Gravel
Crushed Granite
Crushed Stone

SAND & SUPPLIES, LTD.
TORONTO

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

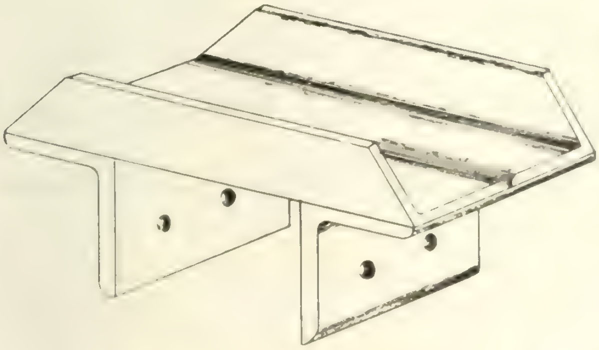
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

Portland Cement

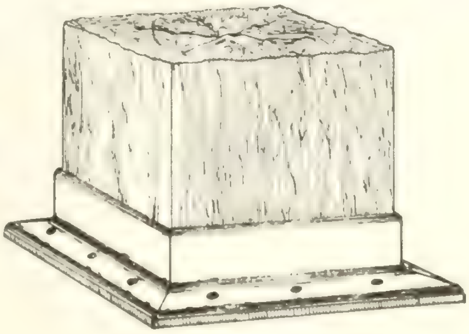
High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

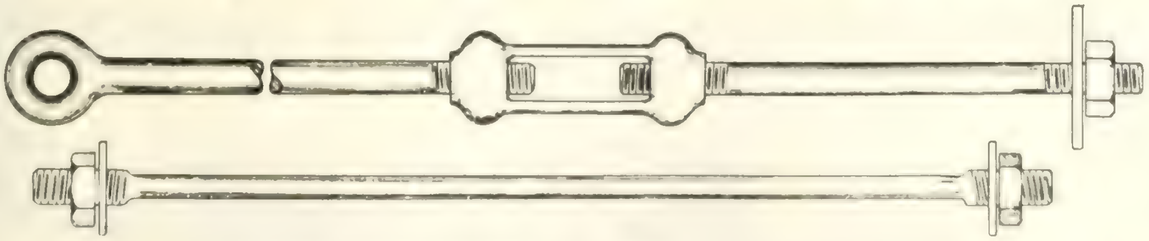
Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company Limited
Hamilton, Canada



STEEL POST CAPS
and BASES
for Wooden Posts,
any size.
Also made in
Cast Iron





EYEBOLTS, TURNBUCKLES and RODS of all descriptions

Beams, Angles, Channels, Plates, any size from 1½ inch to 24 inches, and any length up to 70 feet

S. S. SELMAN, President

A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President. J. G. Allan Vice-President. James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

PROMPT DELIVERIES

Fellowes and Fellowes
59 Yonge Street., TORONTO

Engineers' and Contractors' Machinery

Steel Dump Cars, Hoisting Engines, Derricks Pumps, new and second hand Rails and Cars, Turntables, Clam Shell and Orange Peel Buckets, etc. Contractors' Elevating and Conveying Machinery.

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridge's Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street East, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising
Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.

A.M. Can. Soc. C.E. A.M. Am. Soc. C.E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage
Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C.E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply
Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 413, Pacific Block, Vancouver, B. C.

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams
Laying Inlet and Outlet Waterworks and Sewer
Pipes. Submarine work of all descriptions.
Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

**The John Galt
Engineering Co.**

Consulting, Civil and
Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage
and Electric Lighting.

Toronto and Winnipeg
John Galt John Haddin

Allan Keefer

Architect

Ottawa, Ontario

Arthur L. Weeks

Architect

Canada Life Building, Ottawa

Reinforced concrete and steel structures, factories
and commercial buildings

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE

"TAMCO" Crushed Stone in
all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone
crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.
Limited

MANUFACTURERS OF

Building Granite, Granite
Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on
Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. Montreal

Bell Tel. M. 4354

Rails for Contractors, Switches, Girders, etc.
New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches.......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES

(Installed in Toronto).

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite, 55 cents per square foot.

Viterous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 4 compression bath cock ....net $1.65

No. 4½ Fuller's ....net 2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30 gallon, standard, $4.50; extra heavy, $7.00

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95

Lead Pipe

Lead pipe, 30 per cent off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

PAINTS AND OILS

(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

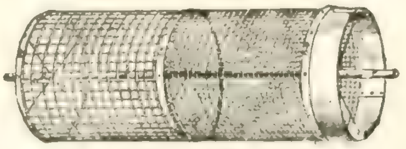
Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of '9 lbs.

Turpentine, in barrels, 8cc per gallon.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

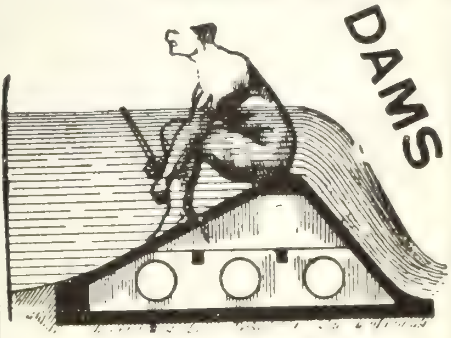
We manufacture
Revolving Screens



and anything in the screen line.
Also railings, wire guards, grills etc.
Electro-plating and all metal finishes.
Estimates Given - **Send for Catalogue**
Crescent Wire & Iron Works
Partridge & Sons **KINGSTON**

Bonds of Suretyship for Others and Employees in positions of trust
Bonds Bid and Supply in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies
The
Guarantee Company of North America
The Pioneer Company *Established 1872*
Head Office - **Montreal**
Capital and Resources over $1 965,000
Claims Paid over - - - $2 265,000
No Claims in Dispute
This Company is not a party to any premium tariff combination

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS
General Manager.
Head Office:
INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

Barrett Specification Roofs

For Large Plants

FOR use on a large modern plant like the Arlington Mills illustrated below, only one kind of roofing is suitable, namely, Barrett Specification Roofs.

The roof area of these buildings is about 22½ acres, which includes saw-tooth, monitor and ordinary flat roofs, under which are valuable machinery and textiles, where a leak might do thousands of dollars worth of damage.

The roof practically gets exposure from both sides, because the humidity of the interior of the building (which is a neceesary feature of textile manufacturing) causes constant condensation of moisture on the under side of the roof.

No other style or type of roofing could be used economically.

Tin and ready roofing would require painting every few years—and think of the cost of painting so vast an area! Slate and shingles are not fitted for use on such buildings.

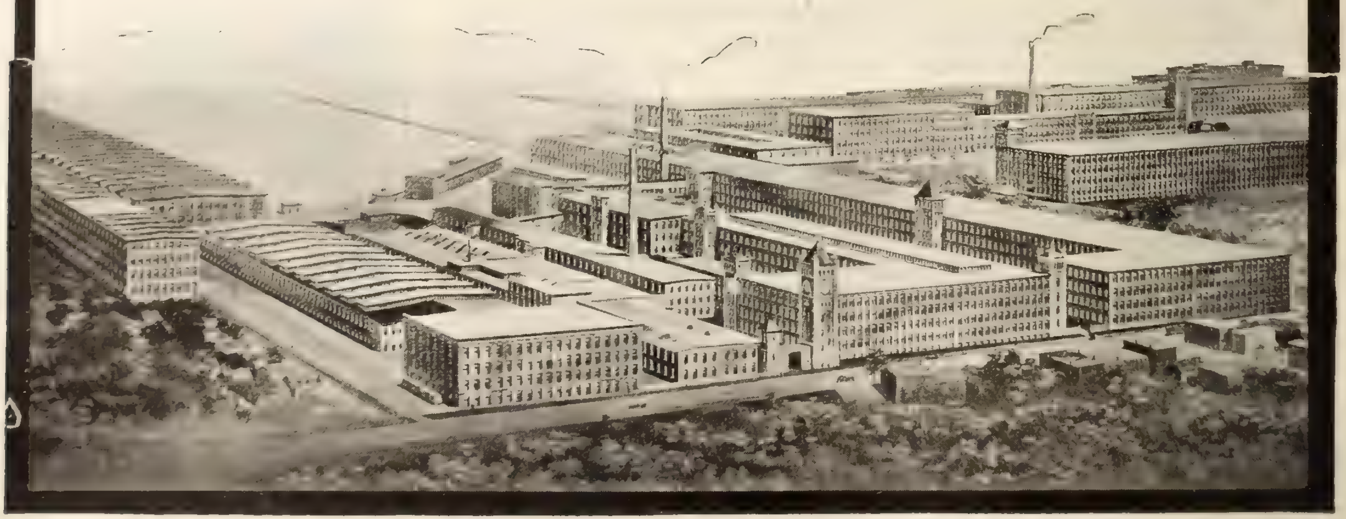
If ultimate economy is desired, a Barrett Specification Roof *must* be used, for its price is lower than that of other permanent roofs and, as it requires no painting, its maintenance cost is nothing. We can point to roofs of this type which have given faultless service for over thirty years without leaks and without repairs.

If you are interested in the roofing problem we suggest you write our nearest office and any information desired will be cheerfully furnished.

The Paterson Manufacturing Co., Limited

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

Arlington Mills, Lawerence, Mass. C. R. Makepeace & Co., Mill Engineers, Providence, R.I.



BEFORE AND AFTER

NO. 1.

NO. 2.

Illustration No. 1 shows the interior of the Office of Drummond, McCall & Company, Toronto, before the installation of Luxfer.

Illustration No. 2 of the same Office taken under exactly the same conditions and within the same hour, shows the efficient lighting given by Luxfer Prisms.

This is only one example in hundreds where a gloomy office has been flooded with light by the use of Luxfer.

Luxfer Prism Company, Limited

100 King Street West, TORONTO

Stop Your Building Until You've Decided on the Gas Question

?

If you are building and have made no provision for gas piping, you are making a grave mistake. You not only affect your own interests, but do an injustice to your client. **Modern Gas Lighting and Appliances** hold a place in the world's progress that must not be overlooked. Your client wants the best that's going. He looks to you for the information. If you are the owner you certainly require the ideal when it comes to home comforts. If you build for renting purposes—you naturally wish to keep good tenants. Good tenants are like customers—give them good service and they stay. In Toronto nearly 70,000 homes and buildings are piped for gas light and fuel — 80% more than with all other systems combined. In Toronto, gas piped buildings are increasing at the rate of 7,000 per year. Why is it? It's because people realize that "GAS" cannot be equalled when it comes right down to quality and actual figures.

Modern Gas is a wonder. **Modern Gas Appliances** have revolutionized the gas business. We want you to consult with us now. We want you to see the "**new things**" before that building grows bigger. We want you to come right down to see the appliances demonstrated. Come in and see the beautiful fixtures, domes, chandeliers, fuel appliances, ranges, water heaters, and hundreds of other useful articles that make a home brighter and labor lighter. Won't you sit down right now and drop us a card; or better still — call and see us. Consultations free.

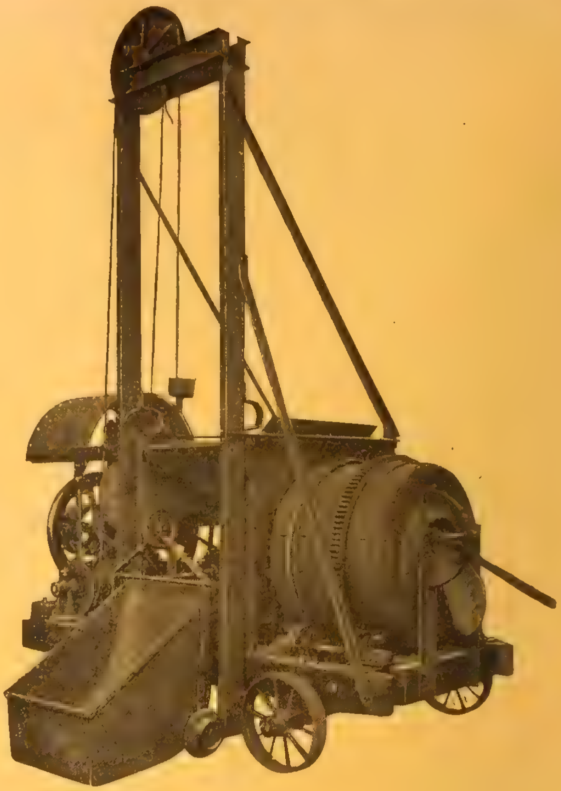
The Consumers' Gas Company, of Toronto

12 and 14 Adelaide St. West.

TELEPHONE: Main 1933

Head Office, 19 Toronto St.

Gas Consumers Increasing in Toronto at the Rate of 20 Per Day.



Ransome Street Concrete Mixer

If you require a concrete mixer of a large capacity and with a very low cost of output for mixing first quality concrete—we want you to investigate our Ransome Street Concrete Mixer. This machine was designed specially for street work and we can prove there is no better machine for the purpose. This outfit is not an experiment—it has been thoroughly tried out in actual service and found to be as nearly perfect as could be possible. Simple in operation—efficient and durable.

We have many street mixers in operation throughout Canada and we would like you to investigate our claims.

Supplied with Gasoline, Steam or Electric Power.

Can we send Catalogue?

F. H. Hopkins & Co.

MONTREAL

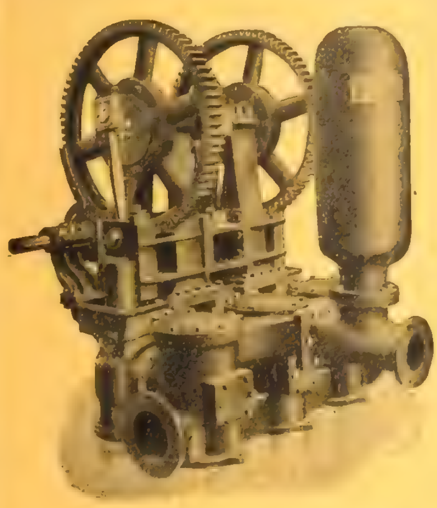
Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.

Vol. 25 Toronto, June 28, 1911 No. 26

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information



We Manufacture
Steam and
Power
Pumps,
Condensers,
Travelling
Cranes,
etc.

Write for Catalogue

The **Smart-Turner Machine Company** Limited
HAMILTON, ONTARIO

"MADE IN CANADA"

Bent Glass

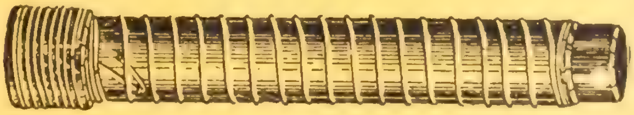
Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: 91 to 133 Don Roadway
TORONTO

High Speed
Portable
COMPRESSORS
Page
28

Canadian **RAND** Co., Ltd.
Commercial Union Bldg., Montreal, Can.



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS
for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

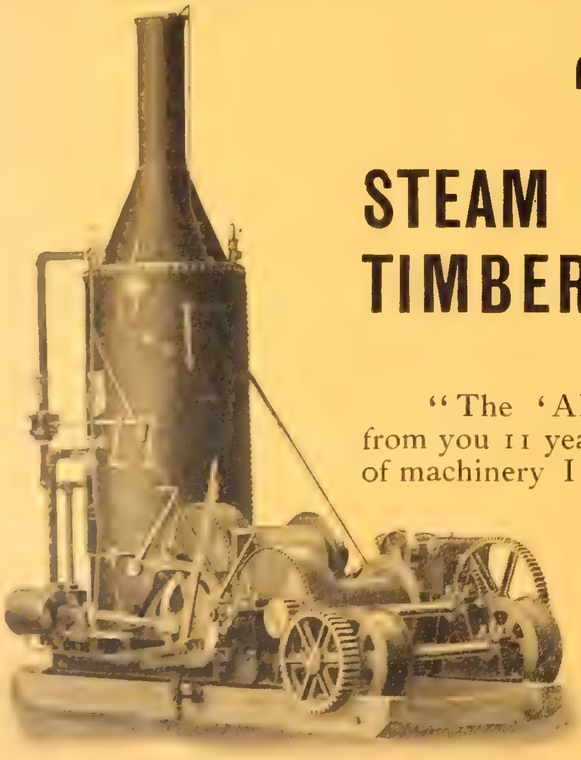
The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

---



"AMERICAN"

STEAM AND ELECTRIC HOISTS TIMBER AND STEEL DERRICKS

OF ALL CAPACITIES

"The 'AMERICAN' Derrick Engine purchased from you 11 years ago has been the most satisfactory piece of machinery I have ever owned.

"It has been in constant daily use with less than 10 dollars' worth of repairs

"W. G. LARUE, Duluth, Minn."

Ask for our Catalog

American Hoist & Derrick Co., St. Paul, U.S.A.

Chicago
New York
Pittsburg

New Orleans
Los Angeles
Seattle

San Francisco
Portland
Kansas City

Spokane
Denver
Winnipeg

Vancouver
Edmonton
Calgary

Name

Address

Please send prices and information
on "AMERICAN." State whether
Engines, Derricks, etc.

AMERICAN HOIST
& DERRICK CO.
Paul, Minn.

C. R.
28/7/11

When making specifications keep these facts in mind about Canada Cement

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

Remember

We guarantee **uniformity of strength, setting qualities, color,** and **fineness of grinding,** which must obtain if Concrete construction is to prove successful.

CANADA CEMENT COMPANY LIMITED
PORTLAND
CANADA
CEMENT
MONTREAL

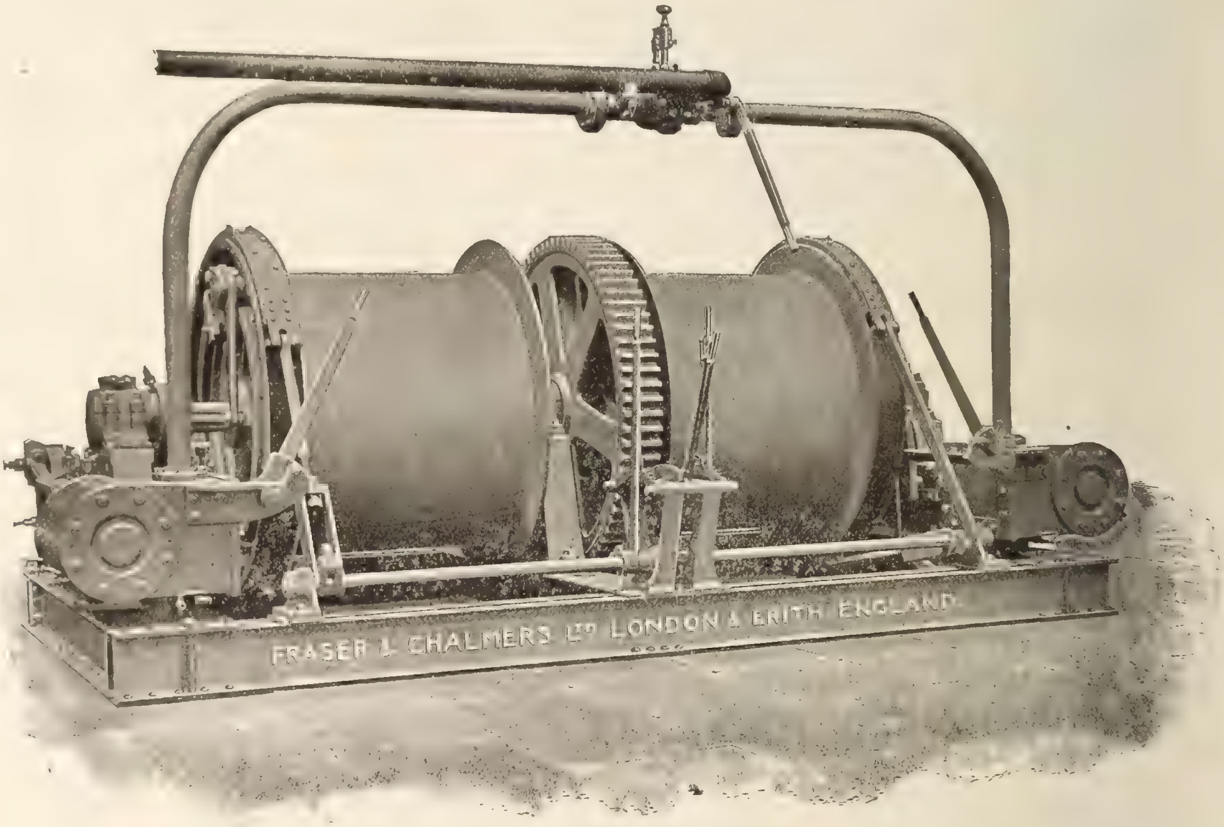
Canada Cement Company, Ltd.

MONTREAL - TORONTO - WINNIPEG - CALGARY

HOISTING

Engines for all Purposes

Special Machines to Order



Cableway Engines

Erector's Engines

Haulage Engines

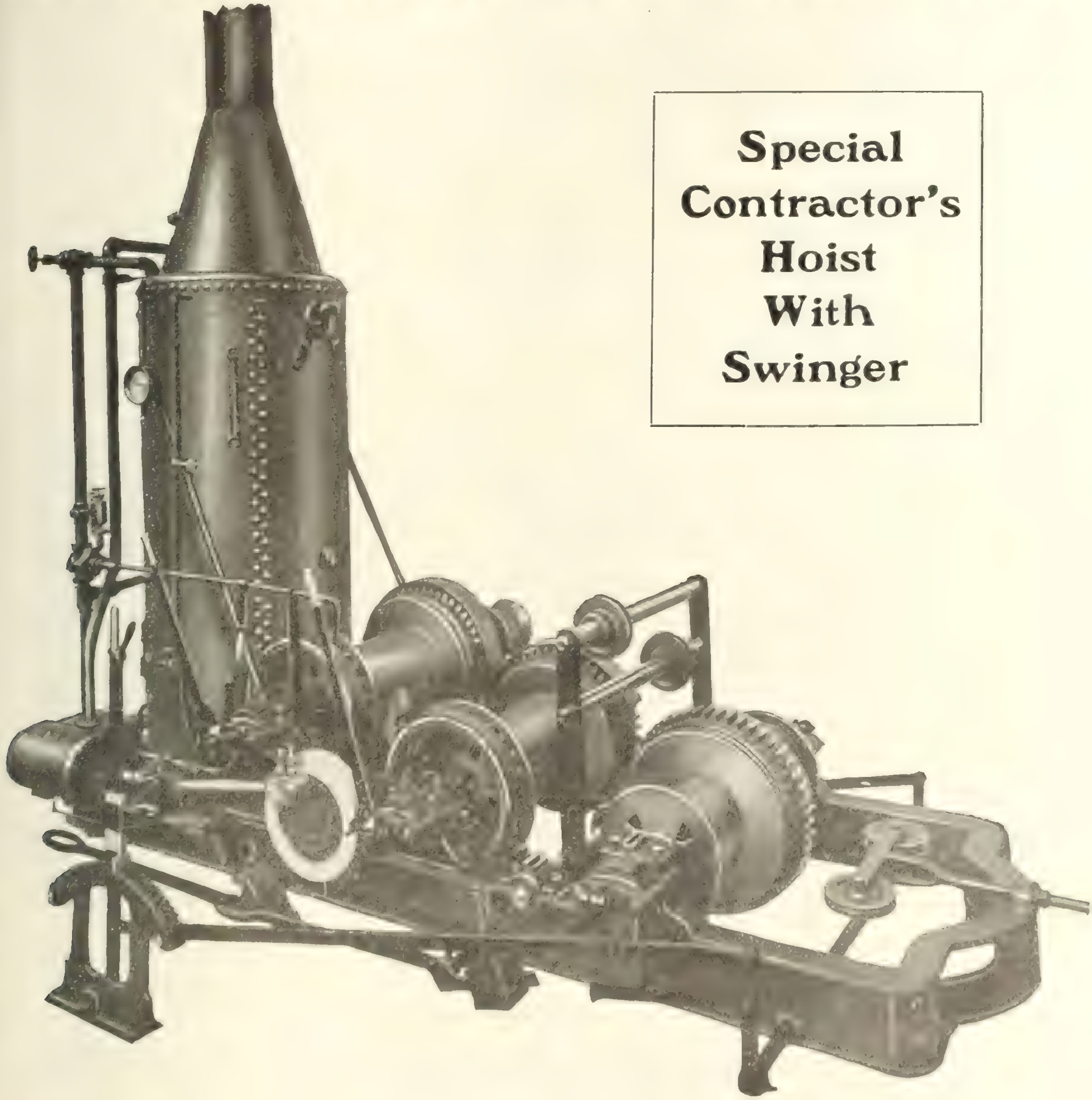
Winding Engines

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

ENGINES

ELECTRIC, STEAM AND BELT DRIVEN



Special
Contractor's
Hoist
With
Swinger

Derricks, Wire Rope and Fittings

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects Page
[illegible] 88
[illegible] 88

Architectural Iron Work
[illegible] Wire Goods Mfg. Co 73
[illegible] Wire & Iron Works 77
[illegible] Co., Geo. B 33

Air Compressors
Escher Wyss & Co 67

Air Valves, Automatic
Marsh, J. P 82

Asphalt Plant
East Iron Machine Co 73

Buckets
American Hoist & Derrick Co 2
Sackett Screen & Shute Co

Belting
Federal Engineering & Supplies, Ltd 80

Blowers
Sturtevant Co., B. F. 2

Boilers
Case Threshing Machine Co 79
Inglis, John 65
Jenckes Machine Co 2
Leonard & Sons, E 73
Marsh & Henthorn 68
McDougall Caledonian Iron Works 67
Mussens Limited 4
Waterous Engine Works Co 77

Brick Machinery and Supplies
Berg Mfg. Co
Peerless Brick Machine Co 25
Wert C. S.
Whitehead, John

Brick
American Enamelled Brick Co
Don Valley Brick Works 7
Hamilton Pressed Brick Co 14
Milton Pressed Brick Co
Port Credit Pressed Brick Co 86
Toronto Pressed Brick Co

Brickmaker's Supplies
Sackett Screen & Shute Co

Bridges (Steel)
Attica Bridge Co 27
Canadian Bridge Co 84
Cleveland Bridge Co 84
Dickson Bridge Works
Dominion Bridge Co 84
Hunter Bridge and Boiler Works 30
Phoenix Bridge and Iron Works 85
Pennsylvania Steel Co 84

Cement
Alsen Portland Cement Co 74
Britnell & Co 80
Bremner, Alex 87
Canada Cement Co 3
McNally & Co., W 85
Morrison & Co., T. A 88
Rogers, Alfred Limited 9

Concrete Pipe
Dominion Concrete Co 22
Lock Joint Pipe Co

Cement Waterproofing
Ceresit Waterproofing Co 33
Hercules Waterproofing Cement Co 25
Mansbendel, F. P 31

Cranes, Travelling & Locomotive Page
American Hoist & Derrick Co 2
Armstrong, H. J 72
Brown Hoisting Machinery Co 77
Males Co 64
Willis Shaw Machinery Co 64

Conduits
Conduits Co., Limited 87

Crushed Stone and Granite
Sand and Supplies 85

Concrete Mixers and Machinery
Canada Foundry Co 20
Cropp Concrete Machinery Co 80
General Machinery Co 78
Gould, Shapley & Muir 16
Hopkins & Co., F., H 92
Ideal Concrete Machinery Co 72
Jenckes Machine Co 2
London Concrete Machinery Co 33
Milwaukee Mixer Co 16
Mussens Limited 4
Morrison & Co., T. A 88
Steel and Radiation (Cement Gun) 76
Standard Scale
Vining Bros
Wettlaufer Bros 10

Contractors' Plant
American Hoist & Derrick Co 2
Acme Eqpt. & Engineering Co 75
Beatty & Sons, M. 6
Hepburn, John T 12
H. & E. Lifting Jack Co 68
Hopkins & Co., F. H 92
International Marine Signal Co 8
Willis Shaw Machinery Co 64
Meaford Wheelbarrow Co.
Marsh & Henthorn 68
Montreal Locomotive Works 32
Mussens Limited 4
Ritchie Contractors Supply Co 27
Tiffin Wagon Co
Troy Wagon Works 70
Watson Wagon Co 26

Crushers (Stone and Rock)
Berg Machinery Co
Case Threshing Machine Co 79
Hopkins & Co., F. H 92
Jenckes Machine Co 2
London Concrete Machinery Co 33
Males Co 64
Mussens Limited 4
Morrison & Co., T. A 88
Willis Shaw Machinery Co 64

Corrugated Iron
Galt Art Metal Co 30
Metallic Roofing Co 69
Metal Shingle and Siding Co 26
Ormsby, A. B., Limited 11
Roofers Supply Co 87

Contractors
Bennett, Robt. 70
Foundation Co 89
Holmes, Fred. 72
McIlwraith, Jas. A 88
Nadel & Adler 88
Wells & Gray 29

Coal Handling Apparatus
American Hoist & Derrick Co 2
Down Draft Furnace Co 75

Derricks and Derrick Fittings
American Hoist & Derrick Co 2

Drills
Beatty & Sons M 6
Canadian Rand Co 2

Drilling Contractors Page
Harvey, J 89

Dredges
Beatty & Sons, M 6
Males Co 64
Willis Shaw Machinery Co 64

Dry Kilns
Sturtevant Co., B. F

Electrical Apparatus, Motors
Canada Ford Co. 34

Engines
Case Threshing Machine Co 79
Canadian Boving Co
Inglis, John 65
Jenckes Machine Co 2
Leonard & Sons, E 73
Mussens Limited 4
Sturtevant Co., B. F 72
Waterous Engine Works Co 77

Engineers (Civil) and Mechanical
Barber & Young 88
Chipman & Power 88
Bowman & Connor 88
Farmer, John T 88
Fuce, Edw. O 88
Galt Engineering Co., John 88
Glaubitz, H. J 88
Hancock, H. Syd 88
Inglis, John 65
Kennedy, Jas. C. 88
Lea & Ferguson 88
Mace, T. Harry 88
Mitchell, C. H 88
McRae, John B 88
Moore & Scollan 88
Taylor, James 88

Exhaust Heads
Sturtevant Co., B. F 72

Filters
American Water Softener Co

Floor Scrapers
Hurley Machine Co 30

Friction Clutches
Berg Machinery Co

Field Instruments
Gurley, W. & L. E 68

Fire Brick
Gibb, Alexander 81

Fire Apparatus
Morrison & Co T. A 88
Seagrave, W E 85

Fireproof Doors and Windows
Douglas Bros 18
Mussens Limited 4
Ormsby, A. B 11
Steel and Radiation 80

Gauges, Steam, etc.
Marsh, Jas. P 82

Granite and Marble
Laurentian Granite Co 83
Missisquoi Marble Co 81
Smith Marble & Construction Co.

Glass Page
Consolidated Plate Glass Co
Luxfer Prism Co
Toronto Plate Glass Importing Co. 1

Heating Apparatus
Jenckes Machine Co 2
Leonard & Sons, E 73
Steel and Radiation 76

Hoisting Machinery
American Hoist & Derrick Co.
Beatty & Sons, M
Canada Ford Co.
Inglis, John 65
Jenckes Machine Co 2
Hopkins & Co., F. H 92
London Gas Power Co 73
Marsh & Henthorn 68
Mussens Limited 4
Parker, S. E 78
Sturtevant Co., B F 72

High Pressure Pipe Lines
Escher Wyss & Co 67

Hydrants
Canada Iron Corporation 87
Gartshore-Thomson Pipe Co 86
Kerr Engine Co

Interior Finish and Doors
Anglin, S. 74
Brennen & Sons, M 29
Batts Limited
Canada Office & School Furniture Co 78
DeLaplante, Ltd. 81
Bryan Mfg. Co 67
Eaton & Sons, J. R. 81
Georgian Bay Shook Mills 29
Rhodes Curry & Co 71
Tillson Co. 19
Wilson Bros.

Locomotives
Montreal Locomotive Works 32

Lime
Christie, Henderson & Co 82
Jamieson Lime Co 71
Standard White Lime Co 75

Metal Lath
Galt Art Metal
Metallic Roofing Co 69
Noble C. W. 74
Steel and Radiation 78

Meters
Hopkins & Co., F. H. 92
McDougall Caledonian Iron Works 67
Neptune Meter Co 71

Paving and Paving Materials
Dominion Carbolineum Works
Metropolitan Paving Brick Co.
Ontario Asphalt Block Co. 74
Shawmut Paving Brick Co 72
Silica Barytic Stone Co. of Ontario 83

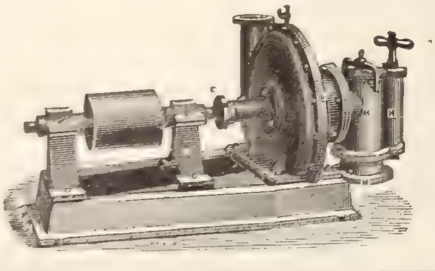
(Continued on page 10)

M. Beatty & Sons, Limited

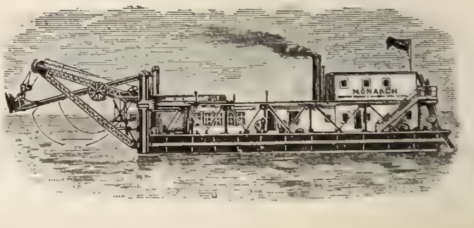
Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

SIMPLE PERFECT

CLEAN WATER

For MANUFACTURERS or MUNICIPALITIES

Can be obtained by using the

"TORRENT" or "PULSOMETER"

FILTER

Complete information furnished on request

International Marine Signal Company Limited

OTTAWA, CANADA

GRAVITY PRESSURE

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster Pag
Albert Mfg Co ... 20
Britnell & Co ... 82
Cashion, H W ... 86

Portable Saw
Canadian Fairbanks ... 7

Pipe
American Spiral Pipe Works ... 75
Canadian Pipe Co ... 80
Dominion Wood Pipe Co. ... 12
Dominion Concrete Co. ... 22
Gartshore-Thomson Pipe Co. ... 86
Lock Joint Pipe Co ...
Munderloh & Co ... 11
National Iron Works ... 87
Pacific Coast Pipe Co. ... 1
Pedlar People ... 23
Steel and Radiation ... 70

Plumbers' Supplies
Standard Ideal Co. ... 34

Power Engines
Inglis Co., John ... 65

Paints and Varnishes
Paterson Mfg. Co. ... 90

Pile Driving Machinery
American Hoist & Derrick Co... ... 2
Lincoln Construction Co. ... 80

Pumps and Pumping Machinery
American Well Works ...
Beatty & Sons, M. ... 6
Cook, A. D ...
Escher Wyss & Co. ... 67
Hopkins & Co., F. H. ... 92
Inglis Co , John ... 65
Leonard & Sons, E ... 73
McDougall Caledonian Iron Works.. 67
Mussens Limited ... 4
Ontario Wind Engine & Pump Co. 80
Smart-Turner Machine Co. ... 1
Waterous Engine Works Co ... 77

Roofing Contractors
Schwoerer & Sons, A. ...

Roofing Materials Page
Asbestos Mfg Co. ... 24
Galt Art Metal Co. ... 30
Metallic Roofing Co. ... 69
Metal Shingle & Siding Co. ...
Noble, Clarence W ... 74
Paterson Mfg. Co. ... 90
Philip Carey Co ... 72
Roofers Supply Co. ... 87
Standard Paint Co. ...

Railway Supplies
Gartshore, John J. ... 88
Hopkins & Co., F. H. ... 92
Mussens Limited ... 4

Reinforcements. Concrete and Steel
Ambursen Hydraulic Construct'n Co. 89
Canada Wire Goods Mfg. Co. ... 73
Concrete Form Engine Co. ... 69
Steel Co. of Canada ... 19
Steel & Radiation ... 78
Trussed Concrete Steel Co. ... 30
Turner, C. A. P. ...

Road Machinery
Case Threshing Machine Co.. ... 79
Hamilton Machinery Co. ... 15
Morrison & Co., T. A ... 88
Mussens Limited. ... 4
Western Wheeled Scraper Co. ... 11

Shovels (Steam)
Beatty & Sons, M. ... 6
Canada Foundry Co. ... 20
Hopkins & Co., F. H. ... 92
Mussens Limited.. ... 4
Males Co. ... 64
Willis Shaw Machinery Co. ... 64

Stone
Anderson, Geo ... 18
Britnell & Co. ... 82
Brodie, Jas. ... 78
Christie, Henderson & Co. ... 82
Consolidated Stone Co.... ... 78
Contractors' Supply Co.... ... 82
Corinthian Stone Co. ... 17
Crushed Stone, Limited ... 73
Doolittle & Wilcox ... 87
Hagersville Contracting Co.. ... 11
Laurentian Granite Co.... ... 83
McMillan & Son, R. ... 71
Morrison & Co., T. A.... ... 88

Stone Page
Myers, Oakley ... 73
Roman Stone Co ... 13
Sackville Freestone Co. ... 8
Sand & Supplies ... 85
Thames Quarry Co. ... 80

Sand and Gravel
Rogers Supply Co. ... 31
Sand & Supplies ... 85

Steam Apparatus
Sturtevant Co., B. F. ...

Submarine Diver
Rouleau, Joseph N. ... 88

Structural Iron and Steel
Dominion Bridge Co. ... 84
Steel Co. of Canada ... 19
Pennsylvania Steel Co. ... 84
Phoenix Bridge & Iron Works ... 85
Reid & Brown.... ... 89
Salter, W. H. ... 85
Steel & Radiation ... 76

Sewer Pipe
Britnell & Co ... 82
Canada Iron Corporation ... 86
Dominion Sewer Pipe Co. ... 21
GartshoreThomson Pipe Co.. ... 86
Hamilton & Toronto Sewer Pipe Co. 20
Lock Joint Pipe Co. ...
National Iron Works ... 87
Ontario Sewer Pipe Co ... 21
Standard Drain Pipe Co. ... 21

Stationary and Power Engines
Case Threshing Machine Co ... 79

Slate
Roofers Supply Co. ... 87

Steel Shingles and Ceilings
Galt Art Metal Co. ...

Smoke Stacks
Leonard & Son, E. ... 73

Tents
Woods Limited ... 79

Safes and Vaults
Taylor, J & J ...

Page
Testing and Inspection Bureau
Hunt & Co., Robt. W. ... 73

Tiles
Smith Marble & Construction Co.,

Tanks and Stand Pipes
Berg Machinery Co. ...
Inglis, John ... 65
Jenckes Machine Co.... ... 2
Leonard & Sons, E. ... 73
Marsh & Henthorn.... ... 68
McDougall Caledonian Iron Works.. 67
Ontario Wind Engine & Pump Co. 80

Trade Journals
Castellanos A. W. ... 80

Valves
Canada Iron Corporation.... ... 87
Gartshore-Thomson Pipe Co.. ... 86
Kerr Engine Co. ...
Marsh & Co, Jas ... 82
Standard Fitting & Valve Co. ... 82

Ventilating and Heating Apparatus
Gardiner & Gaskill ... 77
Sturtevant Co., B. F. ... 72

Water Softeners and Filters
Berg Machinery Co. ...
American Water Softener ...

Wire Rope
Greening Wire Co., B.. ...
Smith, Thos. & Wm. ... 91
Steel Co. of Canada ... 19

Wire Guards and Screens
Canada Wire Goods Mfg. Co. ... 70
Crescent Wire Iron Works ...
Sackett Screen & Shute Co ...
Steel and Radiation ... 78

Water Wheels
McDougall Caledonian Iron Works. 67
Canadian Boving Co. ...

Water Turbines
Escher Wyss & Co. ... 67

Wheelbarrows
Sackett Screen & Shute Co. ...

DON'T BUY a mixer before you see this one

One of the advantages this mixer has over other makes is the small power required to operate it, and the surprisingly low maintenance cost. Remember when you buy a mixer you should consider the workmanship and material in the machine as well as the cost.

Wettlaufer Bros.
178 Spadina Ave., Toronto

A. R. Williams Machinery Company, 15 Dock St., St. John, N.B.

W. E. Ransome, Moosejaw, Sask.

MODERN.

→ ESTABLISHED 1861. ←

MUNDERLOH & CO. LD.

Sole Agents in CANADA for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS

AN IMPROVEMENT ON CAST IRON MAINS.

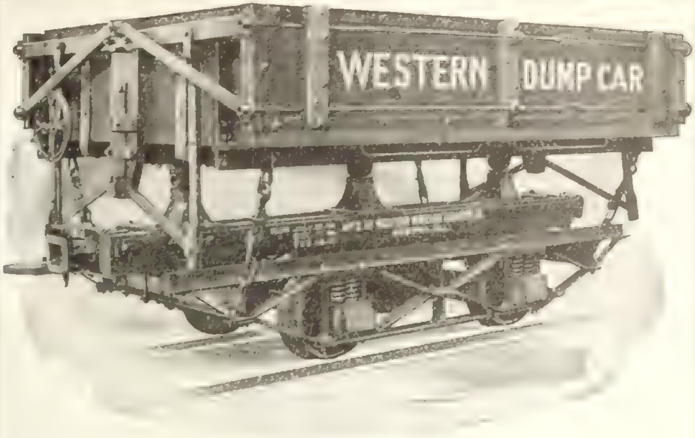
51 VICTORIA SQUARE, MONTREAL.

MADE UP TO 40 FEET IN LENGTH.

STRONGER.

CHEAPER.

RELIABLE



THE

Proved Quality Dump Car

The unequaled **practical** experience back of Western Dump Cars combined with their **sturdy** construction and the fact that they have always led in improvement is the reason for their matchless reputation for **quality** and **efficiency**—they are as good as greatest skill can make them.

The Western Four Yard Car

is ideal size for 3-ft. gauge. It is unbeatable in design and construction—ample capacity for heavy loads, yet of low, compact form, with bed and truck separable, steep dumping angle and automatic pivoted side boards. It is dependable in **any** service.

Sizes and styles of Dump Cars for every purpose are described in our general catalog of earth and stone-handling machinery.

Western Wheeled Scraper Co.

Earth and Stone Handling Machinery **Aurora, Ill.**

You cannot tell this door from a wooden one!

It is an artistic **Kalameined Clad Door.** Really Fireproof and made to your own detail. Finished in any color, no bulging between the wood and the iron, no nail heads or seams. They mean a reduction in Insurance rates. The largest and best buildings and apartment houses in the country have found them a valuable investment.

We would like to give you prices and send you samples of our machine drawn Kalameined Iron.

A. B. Ormsby, Limited

Experts in Fireproof Windows and Doors

Factories: - - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

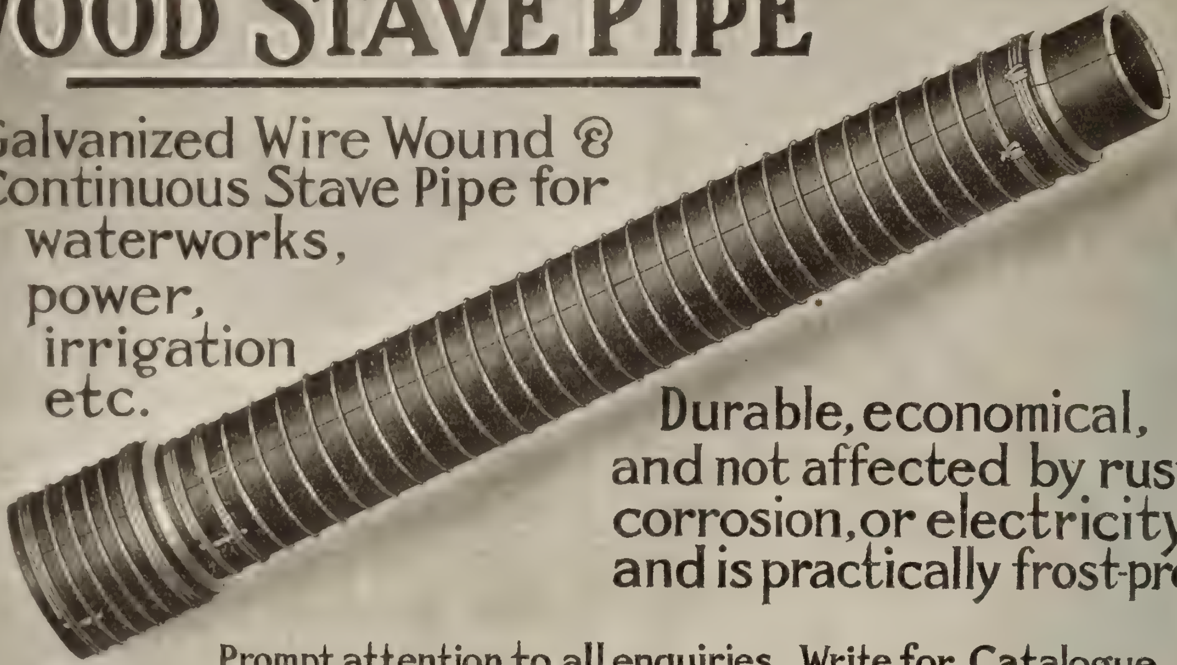
The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R.
and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.



WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Have you any use for a Derrick?

There are large plans under way. Large contracts are being placed. In all directions there is bustle and activity. Everything points to an unusually busy season for construction work of all kinds. But what about equipment?

John T. Hepburn

Scotch Derricks

are in use by all leading contractors in all parts of the country. They are designed and built for hard work, combining safety and high efficiency, with low operating cost. Being made in standard sizes, any part can be replaced at short notice. They may be operated by hand or power—are fitted with single and double purchase gears—powerful band brake—and safety locking device that prevents boom from falling.

We are busy now. We shall be busier in two or three weeks
Better place your order to-day to secure early delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company
Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

Hamilton Pressed Brick

New Collegiate Institute, Brantford, Ont. Chapman & McGiffen, Architects, Toronto

For Clean Brick-Work

This brick is free from so-called soda. After twenty years it will look as clean and fresh as the day it is delivered. Hamilton Pressed Bricks are uniform in size and color. The illustration shows a neat, clean cut job obtained with our brick. Specify **more** than "Brick" make it **"Hamilton Pressed Brick."**

Besides furnishing a high class product we can fill your orders promptly. Connections with T. H. & B., C. P. R., G. T. R., M. C. R

Hamilton Pressed Brick Company

Limited

Phones
Factory 1992
Office 2931
Residence 345

Spectator Building, Hamilton, Ont.

Toronto Representative, WALTER HUNTER 105 MacDONALD AVE.
Montreal, STINSON-REEB CO., Eastern Townships Bank Building.

To You and Your Town

Every **"Champion"** product is worth your money. The complete satisfaction which this line gives is as inevitable as taxes.

Nothing known for improving them is overlooked and the many exclusive features found in them and no other makes them the most practical as well as the most dependable machines on the market.

We Make Everything in Road Building Machinery

"CHAMPION"

"Standard in Canada for 20 Years"

Rock Crushers **Road Graders**
Road Rollers **Road Sweepers**
Road Sprinklers

Send for our Profusely Illustrated Catalog

AMERICAN ROAD MACHINE CO. OF CANADA, LIMITED
Goderich, Ontario

Address all Correspondence to

The Hamilton Machinery Co., Limited

HAMILTON, ONTARIO

Sole Agents for the Above Company

Also Sole Agents for the Celebrated (Interstate) Automobiles and the "Mack" Gasoline Truck for all Motor Truck Service.

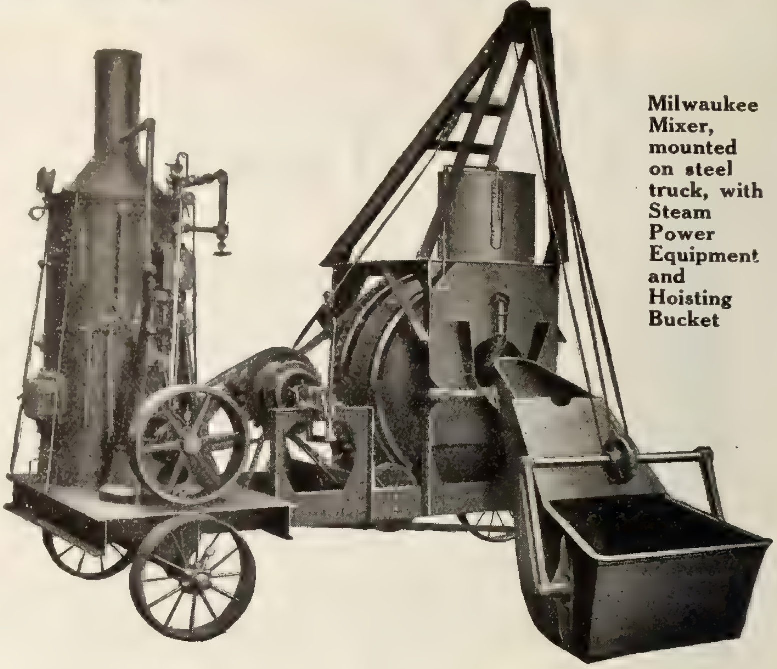
Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES.

The Stewart Machinery Co., Winnipeg, Man. C. W. Stancliffe & Co., Vancouver, B. C.
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS

Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada

Corinthian Stone

is extensively used for Church Building, in trimmings for brick or stone work, it is without an equal. Special prices for any work where a large quantity of repetition occurs :: :: ::

Ingersoll Methodist Church—Architects, Messrs. Taylor & Taylor, Brantford.

A large quantity of Corinthian Stone was used in the remodelling of this church. Estimates given for all classes of work. Send plans or write to :: :: :: : ::

The Corinthian Stone Co.

OFFICE AND WORKS:
G. T. R. JUNCTION, GUELPH, ONTARIO

Circular Diamond Saws

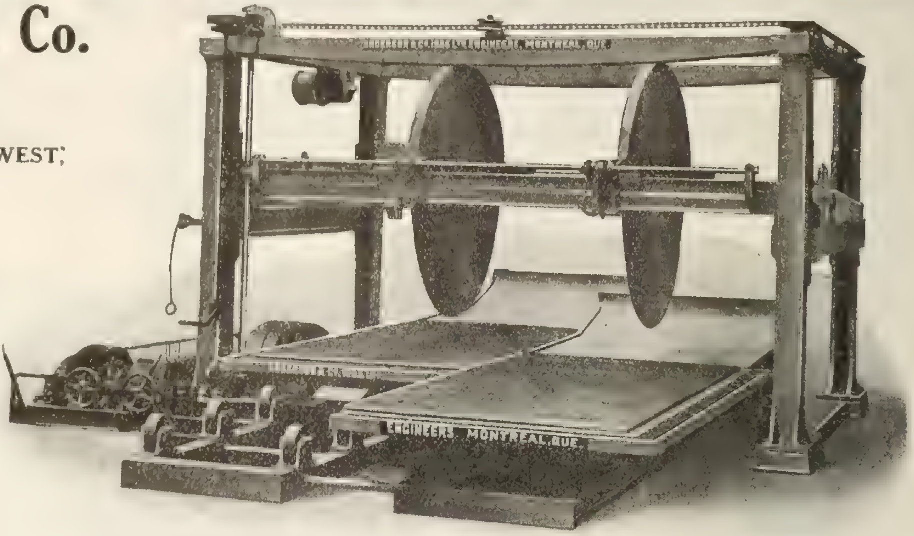
For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICES & WORKS
London, England, 82 Victoria St., S.W.
Newark, N.J., U.S.A. 420-422 Ogden St.
Montreal Works, 157 Craig St. West
Head Works, Carnoustie, Scotland

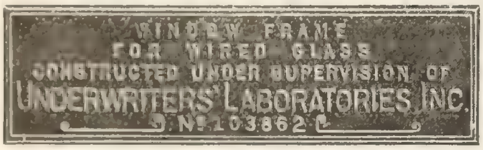
MAKERS OF

Gangs, Planers, Marble Dressers, Derricks, and Electric Traveling Cranes up to 50 tons, Quarry Machinery, Gas Engines and Producer Plants.
10 H. P. to 150 H. P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 SINGLE AND DOUBLE TABLES

About 50 of the above Machines at work in Canada


WINDOW FRAME
FOR WIRED GLASS
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES INC.
No 103862

Underwriters' Label.

The Underwriter's Test

There is absolutely no question as to the comparative value of our Metal Fireproof Windows over the old-fashioned metal or metal-covered wood shutters. Repeated tests have proved conclusively the superiority of metal fireproof windows.

The ideal fireproof windows should be constructed to meet the following requirements:

It must be absolutely fireproof.

It must have hollow sheet metal frames and sash, fitted with wire glass.

It must be riveted and locked together so that it will not fall apart when exposed to intense heat, solder only being used to finish the seams and mitres.

The Douglas Window has stood the National Board of Fire Underwriters' test to which it has been subjected at their Laboratory at Chicago, and is endorsed by them.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

The

Tillson Company

Limited

WHOLESALE MANUFACTURERS OF

Sash, Doors, Mouldings, Frames for Doors and Windows, Columns, Interior Finish of Every Description, Porch Work, Gable Ornaments, Brackets, Head Blocks, Corner Blocks, Base Blocks, Door and Window Screens, Etc.

Millwork of all kinds

Tillsonburg,

Ontario

The Steel Company of Canada Limited

Hamilton - Toronto - Montreal

PLAIN ROUNDS,
& SQUARES,
COLD TWISTED
SQUARES

MAXWELL
DEFORMED BAR

STEEL BARS
for Reinforcing
Concrete

J. H. NEW, President RYLAND H. NEW, Vice-Pres.

Hamilton Vitrified Salt Glazed Sewer Pipe

Known as the best for 50 years
The Quick Shippers

The HAMILTON & TORONTO SEWER PIPE CO., LIMITED
HAMILTON and TORONTO

LONG DISTANCE PHONES: Toronto, Main 990, College, 1558
Hamilton, 3990, 3991, 3432

"Hammer Brand" Hard Wall Plaster

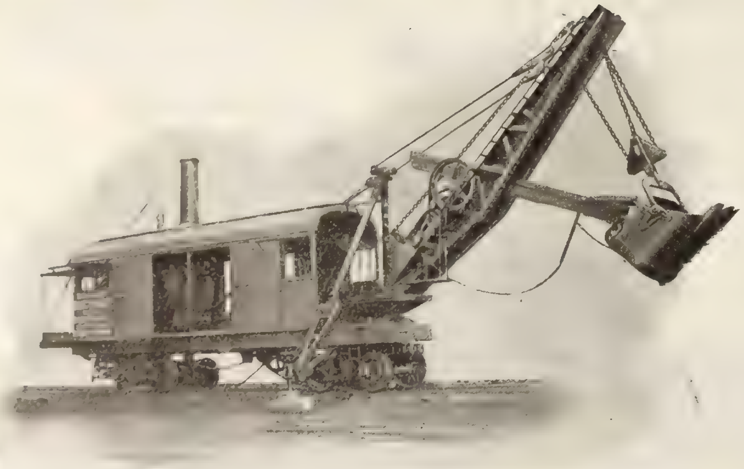
HARD-WALL PLASTER HAMMER TRADE MARK BRAND HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Works Destroyed by Fire — Now Rebuilding

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert **Pipes**

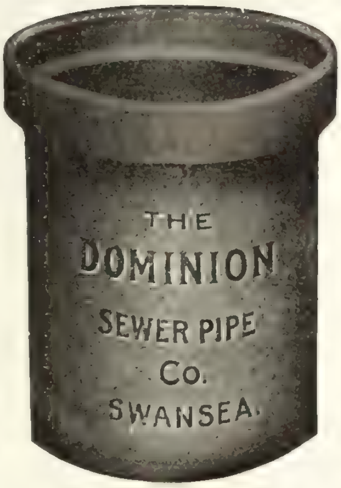
We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

SEWER PIPE

Do You Know These People? We Do.
Speaking of "**MIMICO**" Brand Pipe,

A MR. RUST said that rusting was out of the question.
A MR. BENDER said they were not easy to break.
A MR. BRICKER said they are better than brick-er cement.
A MR. TROTTER said they will carry away whatever runs in.
A MR. BUTZ said he would like to patronize others, but—
A MR. CHIPMAN says he likes them because they don't have to chip 'em.
A MR. MACINTOSH says they are impervious to water.
A MR. DUNN says he is never done ordering.
A MR. DOUGLAS says he has dug less sewers that were a worry since he used them.
A MR. BARROW says they are always transported properly.

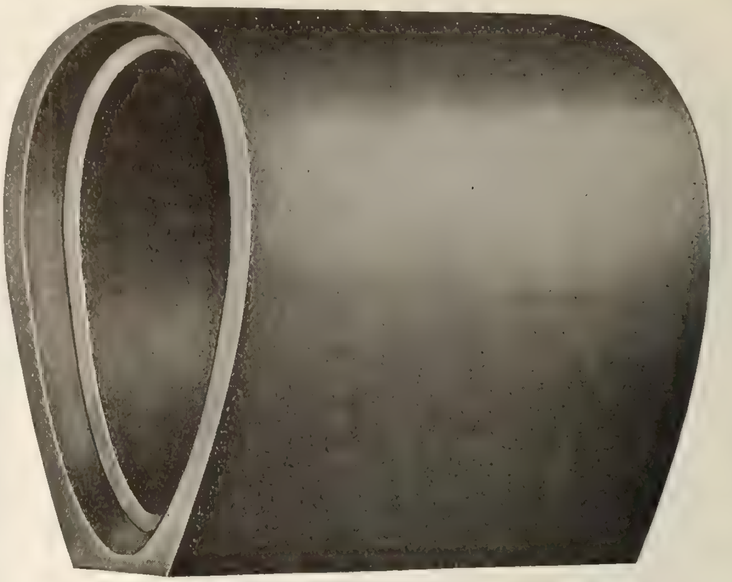
And Believe Me, These Gentlemen Should Know

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO

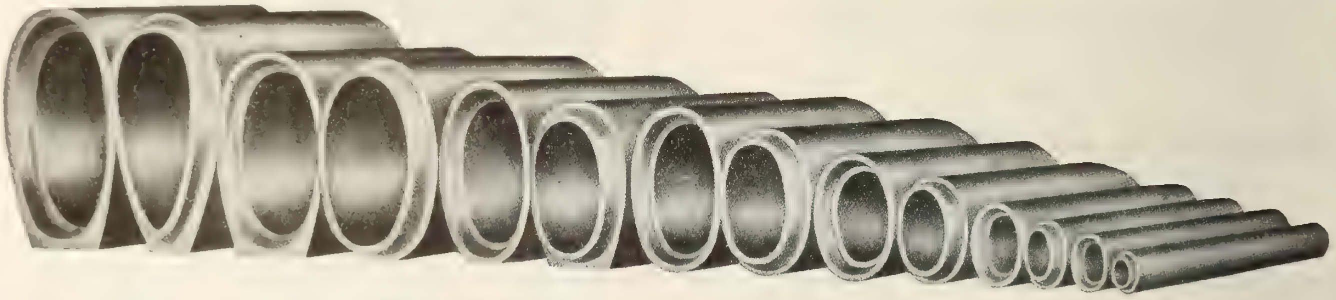
Municipal Engineers and Contractors

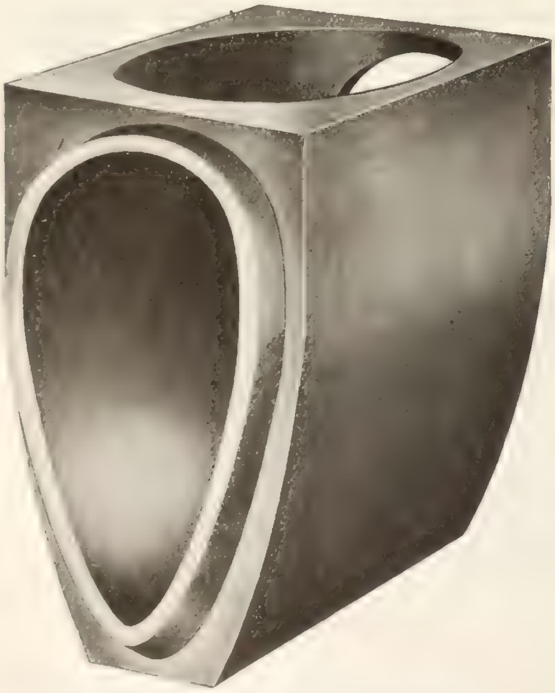
For **sewers** the only everlasting pipe is **concrete.** Builders do not use brick in foundations. Why? Because of the moisture. They do use concrete. Why? Because it is a proof against the destructive tendency of moisture. Why continue to use brick for sewers when a better material is now available at as low a cost?

In **Duluth** brick sewers failed after seven years so as to require replacement. **Concrete** sewers put in at the same time are **intact.** In **Millwaukee** after 25 years concrete pipe was found better than when new. Of 300 miles of sewers in **Millwaukee** over 200 miles are of **concrete.**



Section of 2' x 3' pipe





Man-hole Section of 2 x 3 pipe

Concrete sewers abound in **England** and **Germany.** The modern **sewers** of **Paris** are all of **concrete.** American cities have adopted it. **Brooklyn** has hundreds of miles of it with not a single failure, whereas even Scotch vitrified pipe has been found to have deplorably failed there. **Toronto,** after much hesitation, is now in line with concrete. Why be the last to join the ranks you eventually will and must join ?

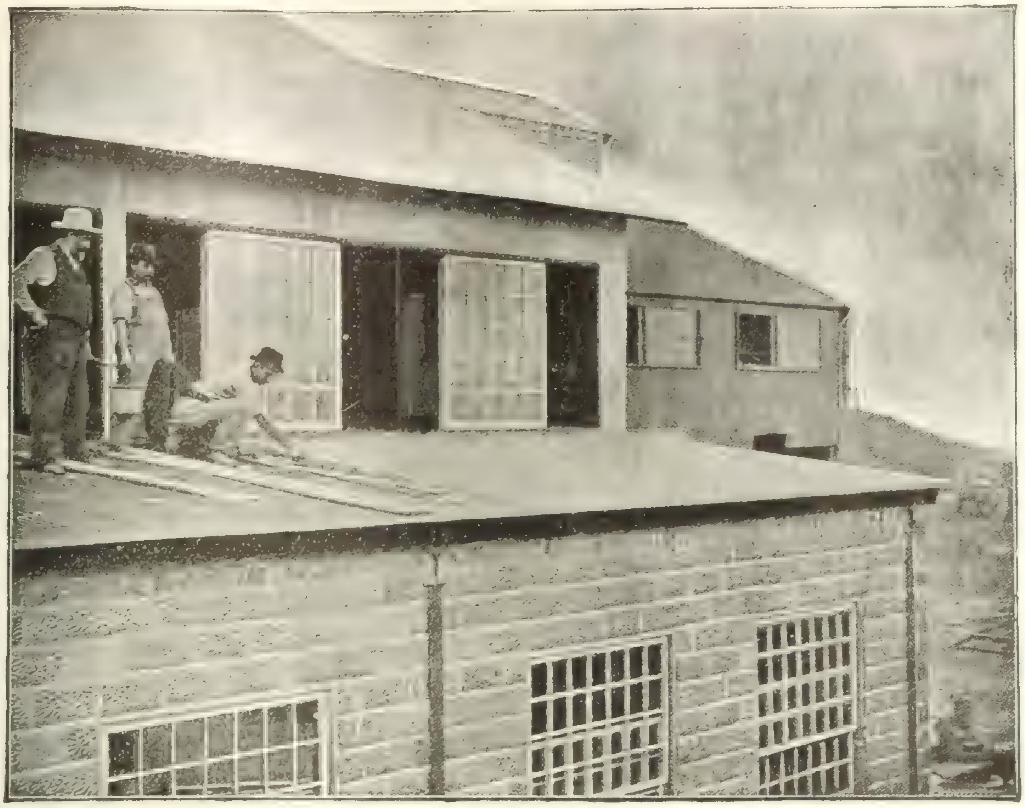
Our circular and egg-shapped sewer pipe are unsurpassed in quality, are more easily laid than flanged pipe, and give no trouble or ridiculous expense over man-holes or connections.

We have replaced vitrified pipe with concrete pipe and have found over 50 per cent of the vitrified unfit for re-laying. We carry a large and mature stock, we guarantee the quality, we take care of breakage in transit, and we solicit your patronage.

WRITE FOR CATALOGUE PRICE

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO



The above Illustration shows the concreting of

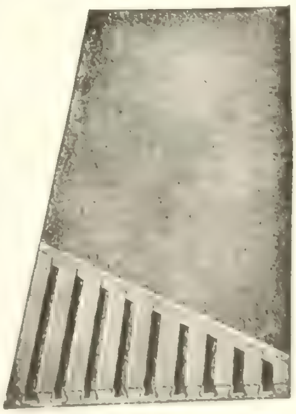
PEDLAR FERRO-DOVETAIL

Plates, which have been laid to form a roof. The under side of these plates is plastered. This is a good example of a roof that is both fireproof and timeproof—the two qualities in which Pedlar Ferro-Dovetail Plates stand preeminent. A roof in which Ferro-Dovetail Plates are used, made of steel and cement, has not an ounce of combustible material in it. The steel plates being concreted on the upper side and plastered on the lower side, are so perfectly protected, that gases, acid fumes, atmospheric conditions or any other injurious influence cannot harm them.

Ferro-Dovetail Plate
Ready To Lay

Ferro-Dovetail floors show no deflection under loads far exceeding the possible requirements. There is no form of floor construction to be compared with Ferro-Dovetail Plates for factories, warehouses, freight depots, breweries, bridges, subways, tunnels, coal bunkers, public halls, etc, etc.

As Pedlar Ferro-Dovetail Plates embody an idea that is new to many architects and builders, we have published a profusely illustrated book dealing with them. This book covers the specifications, the uses to which these plates may be put, and the methods of using them. If you are interested in the subject, we would like to send it to you. On receipt of your request for bulletin No. 52, we will gladly mail you a copy **free.** Write for it.



Ferro-Dovetail Plate
Concreted on Top, Plastered Underneath

The PEDLAR PEOPLE of Oshawa

ESTABLISHED 1861

HALIFAX
16 Prince St.
CHATHAM
200 King St. W
LONDON
86 King St
QUEBEC
127 Rue du Pont
WINNIPEG
76 Lombard St.
REGINA
1901 Railway St. S
MONTREAL
321-3 Craig St. W
CALGARY
215 12th Ave., W
PORT ARTHUR
45 Cumberland St
VICTORIA
434 Kingston St
OTTAWA
423 Sussex St
ST. JOHN, N.B.
42-46 Prince William St
TORONTO
111-113 Bay St
VANCOUVER
821 Powell St
EDMONTON 547 2nd Street

Address Our Nearest Warehouse **We Want Agents In Some Sections** **Write For Details** **Mention This Paper**

A

The *Only* Everlasting Roof

Asbestos Cement Slate

“This is practically indestructible by atmospheric influences, so that maintenance expenses for roofs covered with this material are excluded.

For a period of three months the asbestos cement slate absorbs, and assimilates moisture in exactly the same ratio as the best natural slate. After that time the absorption ceases altogether, and the material becomes impervious, indestructable, and as hard as iron.

The stringy asbestos fibres, which, by characteristic peculiarity of a patented process, are embedded cross-wise in the cement paste. This has exactly the same effect as concrete-steel constructions. They impart to the asbestos slate extremely high physical strength, indifference to blow or shock, and great elasticity. These properties are of the same importance to conveyance, and the laying of the asbestos slates, as they are to their durability and length of service.

The insulating capability of asbestos when brought to bear either upon heat or cold, imparts an increased importance to asbestos cement slate, not only in its suitability for the tropics—where it is commonly used as a substitute for corrugated iron ; but also for the continental climate, where it is economically used in workshops, in dwelling rooms, and particularly over garrets, which, with other roof coverings, would have to remain unoccupied.

The fireproof quality of asbestos renders asbestos cement slate a thoroughly fireproof material, which, owing to its strictly scientific manufacture, cannot become either cracked, rent, or scaled in case of fire.”

The above is an extract, word for word, from a government report of the Canada Department of Mines.

We are the only manufacturers of asbestos shingles or slates in the Dominion of Canada.”

Specify

“Asbestos Shingles”

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P. Q.
Factory at Lachine, P. Q.

Hercules

Waterproofing and Strengthening

Compound

A practical, efficient, economical, and everlasting material for waterproofing and strengthening concrete (or cement).

Gives absolute impermeability; increased tensile strength; increased compression strength; perfect bond in construction joints; elasticity to cement and prevents hair cracks.

DISTRIBUTORS:

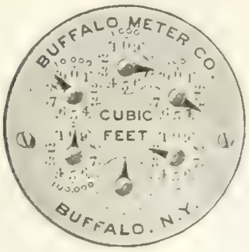
TORONTO—Ontario Lime Association, Ltd.
MONTREAL—Alexander Bremner, Ltd.
OTTAWA—D. J. MacKenzie
HAMILTON—Drake & Avery
WELLAND—David Dick & Sons
ST. CATHARINES—Wilson Lumber Co.
NIAGARA FALLS—W. E. Thomas

Manufactured in powder and liquid forms

Write for book of tests made by leading engineers of the country.

The Hercules Waterproof Cement Company
BUFFALO, N. Y., U. S. A.

AMERICAN AND NEW NIAGARA
WATER METERS



Standard Dial

Straight Reading Dial

Jewel Bearing
Intermediate Gears
Self Cleaning and Sanitary
Adjustment for Pressure
Extra Thick, Strong Disc
Accuracy Guaranteed
Fewest Parts

BUFFALO METER CO.

290 TERRACE, BUFFALO, N. Y.

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City

Jim Fellowes Talk:

The Watson Wagon Company makes NOTHING bu bottom dumping wagons. All their time, money and experience is devoted to doing ONE thing—and doing it well.

And I can assure you that the production of a dump wagon such as the WATSON is a task worthy of the time and attention given to it. One advantage of having all your eggs in one basket is that you can watch the basket mighty close. All the attention and effort in the big WATSON plant is centered on one single type of wagon.

The only reason you can't buy a dump wagon with better wheels than a WATSON is because better spoke and rim stock doesn't grow. The WATSON spoke supply is absolutely the cream from the product of the five largest spoke producers in this country.

Step up to the WATSON wagon anywhere and whittle one or a dozen spokes with your penknife. If you know strictly A-grade second growth white Oak spoke stock, when you find it, there'll be no further argument needed. It's the same way right through the whole wagon.

Watson Wagon Company, Canastota, N.Y.

The First Builders of Bottom Dumping Wagons

BRANCH OFFICES:

256 Broadway, New York, N.Y.   604 Witherspoon Bldg., Philadelphia, Pa.   806 Renshaw Bldg., Pittsburg, Pa.

There is just one excuse for plaster ceilings:——

Only people not familiar with the multiple merits of Preston Steel Ceilings would permit a plaster ceiling to be placed in any house or store they are building. You, as a builder or contractor or architect, should see to it that your customers are made acquainted with the only modern, sanitary, fire-proof, damp-proof and PERMANENT ceiling. Let us prove its excellence to you, and you can then assert it to your customers.

Any property will rent or sell quicker when the ceilings are Preston Steel Ceilings. For these can be decorated beautifully as soon as installed—and the beauty endures. They need no repairs, for they will outlast the building itself. Yet their first cost—which is the FINAL cost—is remarkably little. Your profit is bigger, and the buyer of the property will be better satisfied. On rebuilding jobs, they can readily be used over old plaster.

Preston Steel Ceilings Cost Less Suit Best

Send for big illustrated pattern book, showing a few of the many styles we offer at lowest prices. Let us send you Price List.

Over 1,100 DESIGNS

Ask for the book

The Metal Shingle & Siding Co.

Limited

Preston, Ontario

Branch Office and Factory - MONTREAL

Ritchie Contracting & Supply Co.,

Limited

7th Floor Bower Building, 543 Granville Street,
VANCOUVER, B.C.

Manufacturers and Dealers in Building Materials and Contractors' Supplies

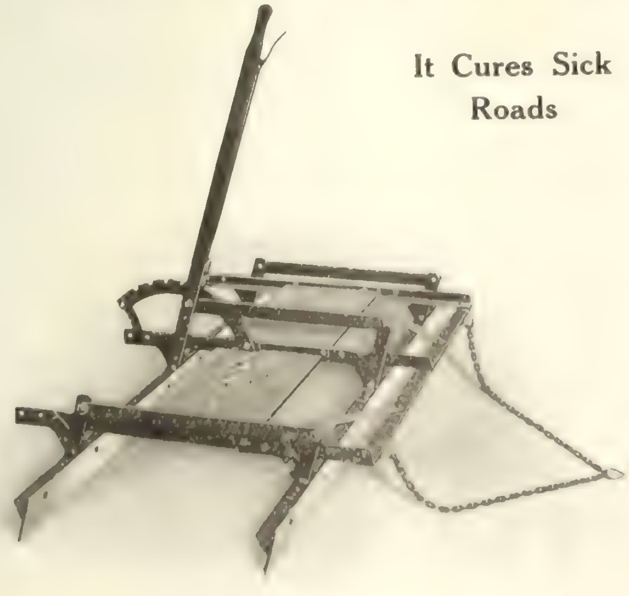
We carry in stock **Ransome Concrete Mixers** and parts.

AGENTS FOR :—**Hart-Ottis Convertable Cars**
Davenport Locomotives
McCully Rock Crushers
Marion Steam Shovels
The Dominion Wire Rope

Write, phone, or call for prices and catalogues.

Our aim, prompt delivery.

Abrico Road Drag No. 1



It Cures Sick Roads

Patented April 28, 1908

Length 8 feet. Width between blades 30 inches.
Blades 6 inches. Weight 300 pounds.

Do you want nice smooth roads?

This Drag will take out all of the **bumps** and fill up all the **ruts.**

It is of steel construction and is adjustable, both forward and backward, and can be operated by one man and team.

Do not let distance keep you from having one.

Your order by mail will be given careful attention.

Manufactured by

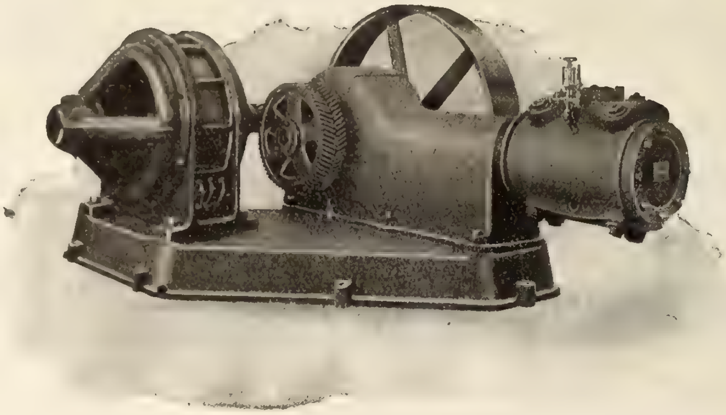
Attica Bridge Company

Attica, Indiana, U. S. A.

Canadian Representatives desired. Write for special terms.

Portable, Gear Driven

COMPRESSORS



Rand Class "NE—1" Straight Line Compressor mounted on a rigid sub-base and geared direct to an Electric Motor. A high speed, simple and perfectly automatic machine particularly adapted to contracting duties, where electric power is available.

The gear driven Class "**NE-1**" Compressor is a simple, reliable design in which automatic operation is combined with great power economy. This type permits of the advantage of direct electric drive at a very moderate first cost.

It is a well known fact that power economy is best effected by generation from a central plant.

Why not take advantage of this direct electric drive and economize on your power consumption, instead of generating your own power by small expensive boiler units.

Class "NE-1" Compressors are built in standard capacities of 50 to 300 feet free air per minute. Pamphlet K-92.

PNEUMATIC TOOLS **ROCK DRILLS**

CANADIAN RAND CO., LIMITED

Commercial Union Building, MONTREAL, CAN.
Toronto, Cobalt, Winnipeg, Lethbridge, Rossland, Vancouver, Halifax
South Porcupine Spokane Sydney

C. P. R. Freight Car Repair Shop, West Toronto

We completed this job in 2 months

WELLS & GRAY, Limited, Engineers and Contractors, **Toronto**

Doors, Sash, Frames, House Trim

Midland Brand

All manufactured in our new and up-to-date factory with latest and best machinery. A knowledge of the requirements of contractors and architects demanding high grade material has enabled us to market interior finish that can't be beaten

Georgian Bay Shook Mills, Limited

MIDLAND, ONTARIO

KAHN SYSTEM

of Construction

includes

UNITED STEEL SASH made of specially rolled steel allowing a maximum of light; is strong, rigid, fireproof, weatherproof. Write us for particulars.

KAHN TRUSS BARS maximum strength and efficiency, minimum labor costs in placing.

RIB BARS—a rolled deformed bar which prevents slipping in the concrete.

RIB METAL—steel mesh reinforcement for floor and roof slabs, cisterns, walls, etc.

HY-RIB—self-centreing reinforcement for floors, roofs, walls, partitions, silos, cisterns, etc.; used with concrete or cement mortar; no studding or wood forms required.

TRUS-CON—chemical products for waterproofing and finishing concrete.

Trussed Concrete Steel Co.
of Canada, Limited
Head Offices and Works, Walkerville, Ont.

BRANCHES:
TORONTO—23 Jordan St.
MONTREAL—128 Coristine Bldg.
WINNIPEG—Union Bank Bldg.
VANCOUVER—52 Hutchinson Bldg.

WE WANT MEN

We require a man in every important town in Canada to report the progress of the building and engineering activities of his locality. We want men to tell us when machinery, equipment, supplies and materials are required—men who can report promptly and accurately news of all sales opportunities in these trades.

We report this information daily to our subscribers. This enables them to get in direct touch with the buyer.

There are one or two places where we are not represented. Perhaps it is your town. It will be worth your while to ask us.

MacLean Daily Reports
220 West King Street, Toronto

STAND PIPES

and

Elevated Tanks

Highway Bridge and Concrete Work.

Boilers of all kinds.

Steel Piling.

Over a quarter of a century's experience in the manufacture of these lines.

Get our figures before closing your contracts

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

The Contractor's "Money Saver"

Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment --- Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto—write us **to-day.**

MACHINE PAYS FOR ITSELF IN A FEW DAYS.

"Little Giant Floor Scraper"

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

Tel. Main 4155

We are now in the Sand Business

Our Wagons hold 2½ Yards

High Grade Sand and Prompt Delivery

Rogers Supply Co.

28 King St. West,

Toronto

WHY IS KITON

Superior to Ordinary Tar?

BECAUSE:

KITON is free from inflamable organic solvents, and therefor far less combustible than tar.

KITON is soluble in water, and in this diluted form can be applied to any surface, whether rough or smooth, hot or cold, wet or dry, as easily as paint. As soon as once dry, **KITON**, like Tar, is absolutely insoluble in water and permanent. Hence its use for

Weather and Waterproofing

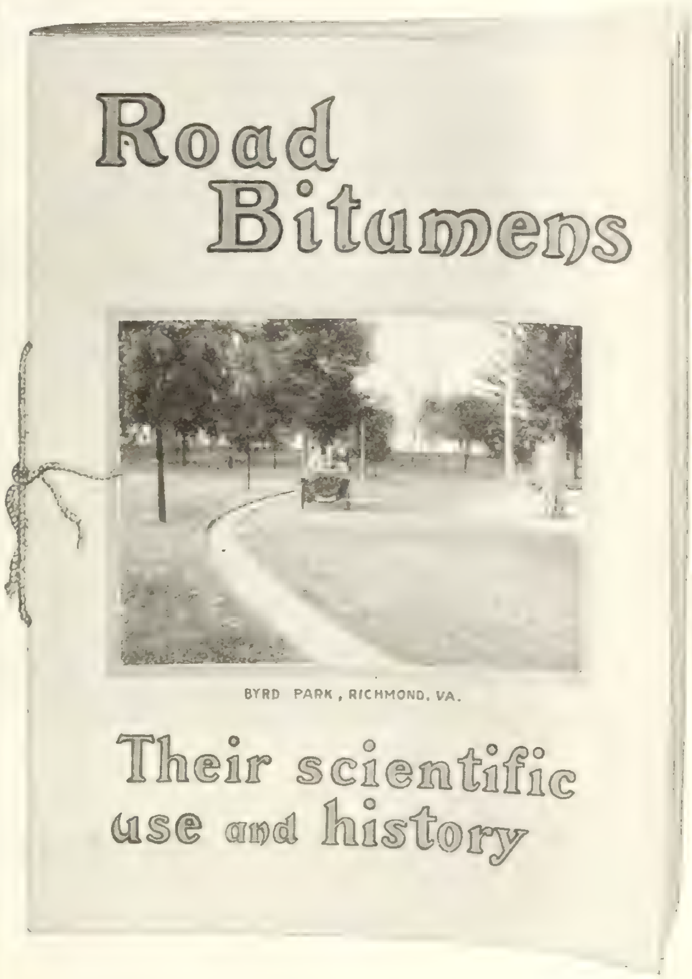
KITON will cover a larger area than the same weight of tar
KITON will do the work better and quicker.
KITON is so easily handled.
KITON needs neither fire nor tarkettle.
KITON will never run, if exposed to the heat of the sun.
KITON will stick positively to any surface.
KITON will take any whitewash, or a finish coat of plaster or cement.
KITON can be coloured.
KITON has none of the drawbacks of tar, but has all of its advantages, and then some.
KITON is cheaper in the long run.

ASK FOR PRICES AND SAMPLE!

F. P. Mansbendel

General Distributor for Canada

212 Huron St., - Toronto, Ont.



Road Bitumens

BYRD PARK, RICHMOND, VA.

Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a phamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement
Company

First National Bank Building
CINCINNATI

BUILT BY
MONTREAL LOCOMOTIVE WORKS, LIMITED

Atlantic Steam Shovels are built by the Montreal Locomotive Works, Limited, at Montreal, Canada. They are not built as steam shovels have always been built, but are designed to do more work for less cost. Every feature is established by experience and every improvement known to be correct in principle has been applied after demonstrating its value in actual practice.

Atlantic Steam Shovels have direct wire rope hoist. Rope is as strong as chain and wears nearly as long, sometimes longer. It is far safer and does not break without giving warning. It is replaced in one-third the time required for renewing or repairing a chain. Furthermore, having warning or wear, it may be replaced out of regular working hours before breakage, and therefore without interrupting the work. Direct wire rope hoist requires one sheave, and that a large one, instead of the five to seven small sheaves chain shovels require. Every sheave means additional friction and additional parts to maintain.

WE HAVE FIGURES TO PROVE

that the direct wire rope hoist saves in cost of maintenance, in cost of fuel and in increased yardage. The Montreal Locomotive Works, Limited, cannot afford to use any but the best materials. We keep our engineers and our laboratories busy testing everything we use.

Our resources, knowledge and experience in engineering stand back of the product.

You cannot afford to purchase a Steam Shovel without investigating the Atlantic. Remember that even a fraction of a cent per yard means increased net earnings on a contract. Write us.

Atlantic Steam Shovels are built on the interchangeable plan. Every part is made in jigs or to gauges, and every part is sure to fit. Stocks are always available at our Works at Longue Pointe, Montreal, Canada.

MONTREAL LOCOMOTIVE WORKS, LIMITED

41 OTTAWA BANK BUILDING, MONTREAL, CANADA

London Concrete Mixers

are made in all sizes, meeting every requirement. CONTRACTOR, WE DO NOT DICTATE TO YOU AS TO WHAT STYLE OF MACHINE YOU SHOULD PURCHASE, we have EVERY STYLE AND SIZE of mixer required.

London Automatic Batch Mixer No. 1
Capacity 50 yards per 10 hours.

London Automatic Batch Mixer No. 2. Capacity 25 yards per 10 hour

These machines will be shipped anywhere on approval. WHY PAY A LARGE PRICE FOR CONCRETE MIXER WHEN YOU CAN PURCHASE AN AUTOMATIC MACHINE AT A MODERATE PRICE?

The London Automatic Machines will save you money—
- Cost of Producing Concrete.
- In the First Cost of Mixer.
- Cost of Maintenance.

We also Manufacture—

CARTS FOR CONVEYING CONCRETE BLOCKS AND TILE
WHEELBARROWS; CONCRETE CARTS
FACE-DOWN BLOCK MACHINES; FRICTION HOISTS
CEMENT BRICK MACHINES; POWER HOISTS
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES

ADJUSTABLE SILL, STEP AND WINDOW CAP MOULDS;
SEWER PIPE MOULDS; FENCE POST MOULDS;
ORNAMENTAL MOULDS; SILO CURBS
CONCRETE CHIMNEY CURBS;
ROCK CRUSHERS;
And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.

London Concrete Machinery Co., Ltd.

19 Marmora Street, London, Canada

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N. S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.

No Wet Cellars No Damp Basements

Ceresit is a cream white paste readily dissolvable in water. This water is used instead of plain water for mixing Cement, Mortar or Concrete.

Ceresit Waterproofing Co.

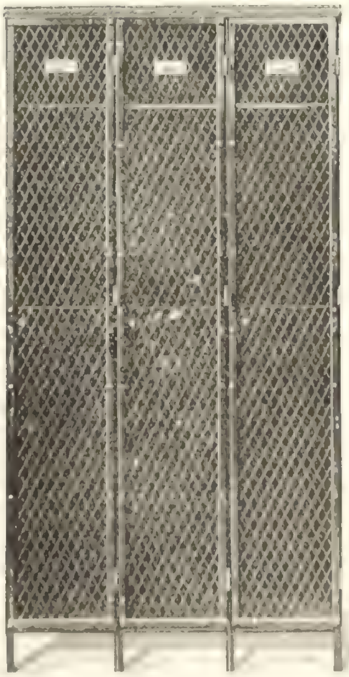
115 Adams Street, Chicago

Canadian Agents

Eadie Douglas, Limited
Montreal, Toronto, Ottawa

Grose & Walker, Limited, Winnipeg
Dean Thompson, Vancouver

GET AWAY



from the old style wooden lockers and use **Meadows' Metal Lockers.** Their construction is rigid and embodies a number of original features not found in other makes worthy of your consideration.

Send for our interesting booklet entitled

"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA

EADIE-DOUGLAS LIMITED

HEAD OFFICE: 12-14 University Street, MONTREAL

Building and Mechanical Supplies and Specialties

BRANCH OFFICES:

TORONTO, - -	65 Victoria Street
WINNIPEG, - -	445 Main Street
OTTAWA, - -	198 Queen Street

REPRESENTING

Leeds Fireclay Company

Burmantofts Architectural Terra Cotta and Enameled Brick. Used by leading Architects and in representative buildings throughout Canada.

"Keystone" Fireproofing Company

Keystone Gypsum Partition Blocks and Furring. Fireproof, Soundproof, better and cheaper than Terra Cotta.

"Esco" Steel Coating and Preservo

A Waterproofing preservative paint for steel, wood and concrete. The solution of all paint difficulties. **PRESERVO—A preservative and waterproofing** for canvas.

"Terrano" Flooring Co'y of Canada, Limited

Terrano Jointless, sanitary flooring. Laid throughout the world, in hospitals, schools, hotels, private houses, power plants, factories, warehouses, etc.

Alphons Custodis Chimney Construction Co.

Custodis Radial Brick and Concrete Chimneys. Are in service in the largest plants in Canada and are lasting monuments to good judgement and business enterprise.

Edward Darby and Sons Company

"Pen Dar" Metal Lockers are the standard throughout Canada. The strongest and best constructed metal lockers, in all different styles and prices.

Mellows & Company Limited

Eclipse Lead Covered Clazing Bars for skylight Construction. Last a lifetime without any painting or repairing. MELLOWS STEEL SASHES AND CASEMENTS.

"Insulyte" Company Limited

A complete organization for the selling and installing all classes of insulating material.

B. F. Sturtevant Company

(Eastern Canada Only)

Sturtevant Electric Vacuum Cleaners, simple, effiicient and lasting. Ventilating and Heating apparatus, engines, motors, etc.

Send for catalogues and descriptive matter on any of the above lines that you are interested in.

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

THE Standard Ideal COMPANY LIMITED

GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA

Of Importance to the Plumber

We now have a set of booklets, pocket size, showing our fixtures and their **roughing in measurements.**

Booklet A—Bath Tubes, etc.
" B—Lavatories and Drinking Fountains.
" C—Sectional Lavatories and Wash Sinks.
" D—Laundry Tubs and Wash Sinks.
" E—Range Closets and Urinals.

If you have not received these we will send them to you free of charge upon request.

STANDARD IDEAL COMPANY, Limited

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

Published Each Wednesday by
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
EAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

ONTREAL Telephone Main 2299 B34 Board of Trade
INNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
ANCOUVER - Tel. - 26 Crowe & Wilson Chambers
HICAGO - - - - - - - - 4059 Perry Street
ONDON, ENG. - - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

ol. 25 June 28, 1911 No. 26

A Fair Field for All

The members of the Toronto Board of Educa-on last week established for once an excellent pre-:dent in awarding a contract for school furnishings to ie lowest tenderer despite the proposal to pass this ver in favor of the next lowest bid submitted by a cal firm. Hitherto it seems to have been the cus-m in many large cities to have taken bids from itside firms merely for the guidance of local con-rns—or perhaps as a "blind." We have always ad-cated very strenuously that when outsiders are in-ted to tender on equal terms they should have ual chances of obtaining the contract. If they are t wanted to figure and if they stand no chance of ing so successfully, intimation to such effect should contained in the call for tenders. It is gratifying know that in Toronto at any rate it is coming to seen that there is no justification for procedure of is kind. Nothing checks the progress of a city in ntracting circles so effectively as unfair awards. It eans the freezing out of the really competent men, d worse, it places a premium upon collusion and onopoly.

The letters by "Engineer" and Peter Gillespie, blished in this issue, will doubtless be read with me interest by at least one person,—City Architect cCallum. No civic official could fail to profit by e wholesome advice tendered by "Engineer." The me writer has also something to say concerning e provisions of the building by-law in regard to ncrete work, and further, concerning the carrying pacity of steel beams.

Mr. Gillespie refrains from entering into a very tailed discussion of affairs, but he criticizes the neral principle adopted by the city architect in giv- "interviews" to the daily press. He says very operly that the technical press is the only quarter which technical matters should be discussed. We uld commend to Mr. McCallum's serious consideration the closing sentence in Mr. Gillespie's second paragraph.

Mr. McCallum would be well advised to make further study of the qualifications of the various members comprising the Citizens' Committee before giving further "interviews."

Necessity for Co-operation Among Engineers, Contractors and Manufacturers

By A. C. Koenig, A. M. Soc. C. E.

The engineer, the consulting specialist, the manufacturer and the contractor are each important parts of the machine, which should be operated in the interests of those who ultimately pay the bill, and harmonious co-operation between all of these parts is essential for the attainment of the highest efficiency in the final results.

Engineers' specifications were formerly so strictly drawn and contained so many "reservations" (to use a mild term) which were subject to the sole interpretation of the engineer, that the "personal equation" was the controlling element in their practical execution.

Contractors' Rights and Wrongs

These "reservations" and indefinite general instructions were merely shields behind which an engineer could hide his limitations of exact knowledge and experience, and placed the burden of expense for "experimental" construction upon the contractor. The contractor was required to furnish the practical knowledge of details which the engineer lacked, and he frequently paid the penalty of reconstruction on portions of the work with which, in the absence of definite specifications, he had foolishly proceeded according to his best judgment, thus affording the advantage of "hind-sight" to the engineer, and enabling him to make practical observations on this "experimental" construction, thereby determining "the method in which the work should properly be done," and to order it thus.

In drawing up specifications, engineers always appropriated the power to "make or break" the contractor, unless the matters involved in controversy were of sufficient importance to seek adjustment in a court of equity. It behooved the contractor, therefore, to invoke the powers of diplomacy (often of dishonesty and subterfuge) to adjust this unfair balance—to "wine and dine" the engineer, to assume a subservient attitude, to take advantage of opportunities to secure a laxity of inspection, to give subtle guidance to the engineer's interpretation of the indefinite clauses—in fact, to exercise all of the ingenuity of natural diplomacy to cause a shifting of the centre of oscillation of the pendulum of unfairness, from the position of unfairness against him, to a position of unfairness in his favor, and against him, and against the "owner," who would thus pay the penalty of an unfair contract in illegitimate profits on inferior workmanship and materials.

Under such conditions successful contracting on a large scale required men of broad mental calibre, with qualifications which generally made them superior to the average engineer in all respects, except the matter of "book-learning," which expression aptly described the meaning and status of education in the conceptions of those who looked upon mathematical and theological knowledge as accomplishments of doubtful practical value.

Good Engineers—Poor Contractors

Engineers who are attracted by the large profits which contractors frequently made, and who persuaded themselves to engage in the degrading business of contracting, temporarily, for the purpose of acquiring sufficient wealth to enable them to pursue their professional career thereafter with comfortable absence of financial worry, generally found that it was impossible for them to adapt themselves to the complete reversal status which such unfair conditions necessitated, therefore failurs was inevitable. Thus arose the popular belief that the training of an engineer absolutely unfitted him for the business of contracting.

Such failures, however, resulted in permanent good, because they served to make their victims broader-minded engineers by giving them an insight into the unfairness of the handicap under which an honest contractor was compelled to struggle to save himself from ruin, thus hastening evolution toward present conditions.

Various phases of engineering-contracting now involve the highest degree of special technical training, and many large manufacturing and contracting concerns not only employ men of the highest order of technical attainments, but also maintain courses of special instruction, with practical technical apprenticeship, for the further development of men who enter theim employ after securing a preliminary education at some technical school.

Manufacturers' Catalogues of Scientific Value

Conspicuous examples of the marvelous development which has resulted from this policy are furnished by the large electrical concerns, steel mills, bridge and structural shops, etc. Catalogues of machinery, materials, and engineering specialties are no longer compiled on the principle which governs the production of a mining prospectus, but generally contain reliable, practical information of scientific value.

The province of the engineer in large undertakings has become largely that of determining the general requirements of local conditions, and serving the best interests of his clients by preparing a general design, or construction plan, which embodies a judicious selection, and proper combination of materials, machinery and special appliances, which have been perfected and standardized by specialists.

Frank cooperation between the engineer and various manufacturing concerns is therefore an important element in the attainment of the best results in any large undertaking. The engineer of limited experience should not attempt to make definite decisions regarding the type of machinery, and the details of arrangement and installation with the specialists, or "experts," who are employed by all reliable concerns for that purpose. Keen competition makes the interests of the manufacturer practically identical with those of the engineer and his client in the attainment of the highest degree of economic success in the final results.

Therefore, in all phases of professional activity, cooperation is the keynote of success.

Uniform Building Laws

The lack of uniformity existing in the laws enacted to regulate and govern the construction of buildings throughout the country has probably occasioned as much confusion and trouble as the fact that the greater majority of them have not been dictated by profound knowledge or even, in all cases, an earnest desire to render the greatest possible measure of protection and benefit to the greatest possible number of citizens, says the American Architect. Of course, there is no reason than can justify the use of certain materials under certain conditions in one city and their rejection under similar conditions in another. Obviously, one authority or the other is in error, with the result that architects and others connected with building enterprises are reaching a point where they feel little respect for the building laws of any city.

If it were possible, and there appears to be no insuperable obstacle to such a plan, to draft comprehensive rules governing the use of structural materials in buildings and then enact those rules into laws applicable throughout an entire State, it would seem that some progress had been made. It is readily apparent that certain restrictions as to character of buildings permissible in certain localities would be necessary, but a considerable degree of uniformity might be secured if such features as allowable stresses in various materials, ingredients of mortars and concretes, the bearing power of different classes of materials encountered in foundations, requirements of sanitation and many similar matters were determined. It might also be feasible to define the various styles of construction and classify the buildings belonging to the various types prescribing the construction of each. To each individual community might safely be left the determining of limits within which only buildings of fireproof or other class could be erected. Also other matters, such as heights, court areas, etc., which would depend largely on local conditions and might vary greatly with them, could not well be included in a general code, but such features are not the cause of present unsatisfactory conditions.

A distinctively progressive step has been taken in Pennsylvania. A joint resolution providing for the appointment of a commission to investigate the manner of construction of buildings in the State and to determine the strength and character of materials in order to safeguard the health and life of persons occupying the same and to codify the laws in relation to buildings has been introduced into the Senate. The resolution has received the approval and endorsement of the Pennsylvania State Association of the American Institute of Architects, which endorsement also carries a suggestion that the appropriation feature of the bill appears inadequate to defray the expenses of the far-reaching inquiry necessary to the proper carrying on of a work of the magnitude and importance contemplated by the bill. It is to be hoped that this resolution will gain passage and that the action of Pennsylvania will be a forerunner of similar actions throughout the country. The subject is unquestionably of first importance, not only to the architect and those directly engaged in building, but to the public at large.

It is expected that the Canada Cement Company will, before long, enter into closer working arrangements with the Associated Portland Cement Manufacturers' Association, which recently announced its intention of establishing works and depots in various foreign countries. Canada is not included, as the directors contemplate arrangements with the Canada Cement Company which will obviate the necessity of fresh works in Canada. There is, however, no proposal that the Canadian company become an integral part of the English concern.

Toronto's Defective Building By-Law

Pertinent Observations by "Engineer" and Mr. Gillespie—What Mr. McCallum's Investigation Costs the City—Function of the Technical Press

"McCallum Sticks to Guns"

Editor, Contract Record:—In your issue of June 14th you call attention to an interview with the city architect on the proposed revision of the building by-law. This was reported in the Telegram of June 6th. under the caption, "McCallum Sticks to Guns." The interview closes with the following statement by Mr. McCallum, referring to reinforced concrete construction: "I know that the formula which I demand is safe and that it will stand the test, and I intend to insist on it."

It is to be hoped that the city architect has not been correctly reported. When the Memorial of the Citizens' Committee, asking for a revision of the building by-law, was presented to the Fire and Light committee it was referred to Mr. McCallum with instructions to investigate the complaints and report in two months. He accepted the commission under protest, stating that he could not possibly get together sufficient information to report in that time.

The Fire and Light Committee paid a great compliment to Mr. McCallum in thus placing him as judge over the critics of his own work. He is not showing a proper appreciation of their action if he is willing to announce his decision in the press at a time when he is supposed to be just starting his investigations. It is reasonable to expect that his subsequent study of the subject will be biassed.

Expensive Deliberations

The Citizens' Committee have estimated that the present by-law compels the needless expenditure of a million dollars a year on the part of building investors. Mr. McCallum's two months would thus cost $167,000. If a decision has been reached the Fire and Light Committee should call for a report at once.

Mr. McCallum is showing great courage in "sticking to his guns." When the matter was first referred to the Fire and Light Committee, it was suggested as a fair solution of the difficulty that it be referred to two or three local engineers not identified with either the committee or the city architect's office. No such engineers could be found. The Engineers' Club, the Toronto branch of the Canadian Society of Civil Engineers, and the Canadian Cement and Concrete Association had all identified themselves officially with the Citizens' Committee. Their practising members had all been active in the agitation for revision.

The next idea was to appoint engineers from the staff of the School of Practical Science. This, too, was impossible. The Dean of the Engineering Department had been appointed on the committee to represent the Canadian Society of Civil Engineers. The lecturer on Applied Mechanics is one of the representatives of the Canadian Cement and Concrete Association and the lecturer in Strength of Materials is secretary of the committee. It was impossible, therefore, to nominate competent local engineers who were not already committed to revision. Clearly Mr. McCallum stands alone in his opinion of the by-law.

Crude Provisions for Concrete Work

Mr. McCallum states that he favors the present provisions in the by-law in regard to reinforced concrete construction because they are safe. The committee states that they are merely crude.

For example:—In the end of a reinforced concrete beam, the stresses result largely from the tendency of particles to slip by each other along an approximately vertical plane. This stress is called shear. In the bottom and top of the beam are horizontal bars used for reinforcement. These bars cannot be regarded as of any value in resisting shear, because if the beam should crack and start to fail they would easily bend and tear out from the concrete on one side of the crack. In spite of this, the building by-law allows these to be considered as resisting shear to the extent of 10,000 pounds per square inch. Thus far, this has led to no trouble in Toronto, because other provisions of the by-law are so burdensome that very few reinforced concrete structures are built here, and because the engineers who built these few followed standard practice wherever possible instead of the building by-law.

The provision regarding columns is another case to the point. A column is reinforced with steel rods placed vertically. The distribution of load between the vertical bars and the concrete can best be understood by comparing them to two spiral springs of different stiffness, one placed inside of the other and both supporting a common load. Obviously the load would be divided between the springs in proportion to their relative stiffness. Now the same thing occurs in a reinforced concrete column. The by-law states that the stiffness of a square inch of steel shall be regarded as twelve times the stiffness of a square inch of concrete. In other words the steel shall be given twelve times the load per square inch that is given the concrete. Just over the page it is stated that concrete in compression shall carry 350 lbs. per sq. in. and steel in comparison 12,000 lbs. per sq. inch. The ratio here is one to thirty-four, instead of one to twelve. The general practice is one to fifteen with 7,500 lbs. per square inch as the limiting stress on the steel. A column designed according to the by-law, therefore, will be safe or dangerous according to the percentage of the total load carried on the steel at the excessively high stress of 12,000 lbs. per square inch. That Toronto has, thus, far, had no disasters on this account is due to the intelligence of reinforced concrete designers, and not to the conservatism of the by-law. Mr. McCallum is mistaken in taking to himself the credit for our immunity.

Carrying Capacity of Steel Beams

Mr. McCallum in his interview appears greatly aggrieved at the attitude of the Citizens' Committee in criticising his formula for the carrying capacity of steel beams. He says that the formula in the by-law is copied from the New York by-law and [illegible] should not be blamed if it is not satisfactory. That is true. Mr. McCallum's interpretation of this formula, however, is all his own. There is no authority for this interpretation either in the by-law or in engineering practice, and for it Mr. McCallum must stand solely responsible.

Briefly, the difficulty is regarding the meaning of the term "net area" when applied to the flange of a built-up steel girder. Theoretically, if there were no rivet holes taken out of the steel it would be one-sixth of the area of the web plate plus the area of the flange angles and plates riveted to them. Good practice, however, allows for possible rivets in the web plate by taking one-eighth of this area instead of one-sixth, and deducting theoretical holes from the flange angles and plate each one-sixteenth of an inch larger than the actual holes that have been punched. Occasionally, when designing for very severe usage in railroad bridges, the eighth of the web area is not considered, but this practice never extends to building work. Both the Dominion Government and the C. P. R. consider the web area.

Mr. McCallum, however, not only refuses to consider any part of the web area, but even refuses to consider the legs of the flange angles which are rivetted to the web. The justification of the present standard practice in the design of steel girders, lies in the fact that there is no recorded instance in all the world of a steel girder thus designed and built with ordinary steel having failed under the load it was intended to carry. Mr. McCallum's interpretation of this clause, therefore, does not increase the safety of buildings in Toronto. But it does increase the cost of building by hundreds of thousands of dollars annually.

Toronto could well afford to pay a million dollars if by so doing she could secure an intelligent and properly administered by-law.

Yours truly,
"ENGINEER."

The Function of the Technical Press

University of Toronto, June 20, 1911.

Editor, Contract Record:—I have read with much interest your editorial on "Toronto City Architect on the Safe Side" in your issue of the 14th instant.

Whether the City Architect intended it or not, the impression which the general reader must have obtained from the various "interviews" which have appeared from time to time in the city dailies, is that the Citizens' Committee which prepared and presented the Application for the revision of the Toronto Building By-law, were endeavoring to force the City Architect to sanction the use of inferior building materials and to accept flimsy and unsafe types of construction. This is most unfortunate. As a member of the Citizens' Committee, knowing something of the powerful influences that on similar occasions in other places have been brought to bear by those commercially interested, I can say without fear of contradiction that no committee in its deliberations could have escaped with less sinister interference than this one. The dominating motive was a desire to secure "a reasonable, safe and workable by-law." These "interviews" should never have gotten into the daily press since their effect is generally to mislead. The writer is pleased to observe that the Chairman and Secretary of the General Committee who may perhaps be regarded as the spokesmen for the others, have up to the present refused to let themselves be quoted through that medium. The technical press is the channel and the only one through which such grievances should have been aired. Surely too, the city architect can find in the list of those who served, a sufficiently large number of reputable, competent and disinterested citizens to assure him that a sincere attempt at honesty was made.

The fine recommendations regarding reinforced concrete on page 48 et seq. of the memorial, are in general accord with the recommendations of the Joint Committee on Concrete and Reinforced Concrete of which such men as W. K. Hatt, Richard L. Humphrey, A. N. Talbot, L. S. Moisseiff, F. E. Turneaure and others are members. This Committee after months of diligent study and research has endorsed certain principles of design which it would seem, the City Architect has decided to ignore.

Mr. McCallum is no more anxious to secure careful inspection than is the Citizens' Committee. He will recall this as one of the topics especially emphasized the Secretary of the General Committee in his brief address on the morning on which the memorial was presented to the Fire and Light Committee of the City Council. One of the shortcomings of the present arrangements at the city hall is that the architect's department has been insufficiently manned to give the careful scrutiny that building operations require. Still, an excessive amount of material and a surplus of dead weight is a very questionable method of securing safety. What we want in Toronto is an up-to-date impartial building by-law and the committee doubtless cares very little who drafts it so long as the work is in competent hands.

Very truly yours,
Peter Gillespie.

Increase Sale of Brick

Brick is the aristocrat of building material. It has a known pedigree which goes back to a day more than three thousand years before Christ, when the Assyrians reared their terraced temples and palaces in Western Asia.

In Ur of the Chaldees, whence Abraham went into the reaches of Canaan, in Ninevah, and in Babylon, the important buildings were made of brick.

Brick may reach a venerable old age, but it never reaches the state of decrepitude. Brick comes from the bosom of Mother Earth in the form of plastic clay; it is hardened by the most powerful agency in the world—fire, and is proof against the further encroachment of fire. It defies wind and rain. It is as enduring as the earth itself.

Then let us consider why builders should use brick. There are many reasons, but I will mention only a few. They are durable, being better than iron, as they do not rust. Brick buildings practically need no repairs. Brick are manufactured almost everywhere and can be bought at reasonable prices. They do not decay. By their use the best buildings can be constructed at a very moderate cost. They do not twist, shrink, or crack. They will not disintegrate or crumble. Brick lend themselves to artistic designs of great variety. The brick building is fireproof.

These vital points in favor of brick, it would seem, would be convincing and that every one would use brick rather than lumber, where it is possible to do so. Why is it, that this is not true?

Chiefly because the vast majority of people are under the impression that brick buildings cost much more than frame buildings. In fact, the general idea is that the cost of brick buildings is almost prohibitive.

Perhaps it is natural that we, who were born and have grown up in the land of wooden houses, should take this type for granted. But on account of the fact that lumber is daily becoming scarcer and more expensive, making the cost of a house of brick very little more than of cement or wood. The Building Brick Association of America recently undertook to determine something definite regarding this matter.

Economy of Brick in Residence Work

For this purpose a modern eight-room frame house of good design was chosen, and plans and specifications were prepared by a well-known and competent firm of architects. These plans and specifications were submitted to five well-known contractors, and each fully advised of the object of the investigation.

Each contractor was given the same information and instructions, and each took plenty of time to figure with care, with the following results:

Taking a weather boarded house as a standard, they found that a house complete with the outside walls 10 inches thick of brick, would cost an advance of 6.5 per cent. over the weather-boarded house; that a house with 12-inch thick brick walls would cost an advance of 10.7 per cent. over the weather-boarded house; that a house of stucco, on hollow clay block, would cost 4.9 per cent. in advance of the weather-boarded house; that a house of stucco, on frame, would cost an advance of 2.5 per cent. over the weather-boarded house; and that a house with 4-inch brick veneer, on hollow clay blocks, would cost an advance of 7.7 per cent. over the weather-boarded house.

In these estimates, face-brick were figured to cost $17.50 per M. and common brick $9.00 per M., which cost in Macon $14.00 and $6.00 respectively.

By the above figures you will note that there is only a very small difference between the different modes of construction in point of cost.

These figures are absolutely correct, and the contractors' bids with their offers to build this identical house at the figures named can be had. Notwithstanding these facts and figures, thousands of wooden houses are being erected every year. Why? Becaues the public does not know the truth.

Does Advertising Pay,

How are we to educate the people? By intelligently and carefully prepared advertising matter, which will present "Facts in Favor of Brick." We are sometimes asked "Does advertising pay?" In fact, we sometimes ask ourselves the question.

Name for me fifteen articles that you purchase somewhat regularly, and I will show you that not less than ten of these articles are widely and constantly advertised. How about that hat; those shoes; those collars, shirts and underwear; that suit of clothes What is your favorite brand of cigars, soap, baking powder, coffee?

Do you buy known or unknown hardware? Are you influenced to a certain, in fact to a large extent, by the effect of someone's advertising? Take an inventory of all the purchases you make and tell me how few of them include absolutely unheard of unknown articles.

"The man who whispers down a well,
About the goods he has to sell;
Won't reap the shining, golden dollars,
Like him who climbs a tree and hollers."

Do you know that our fires destroy annually nearly, if not quite, as many buildings as we erect? In America the fire loss during the year 1907 was $2.51 per capita. In Europe in the same year the loss was only 33 cents per capita, nearly eight times as much in America as it was in Europe. In America we use 500 feet of lumber per capita, and Europeans use only 60 feet per capita. Europe uses brick.

Only one word more. Let me say to those of you who handle brick: The best way to sell brick is to always carry a stock of them. You can't sell what you haven't got.—By W. E. Dunwody, in Brick.

Crossman System of Sludge Treatment

Past failures have not discouraged those who are laboring on the problem of recovering a part, at least, of the valuable matters in sewage. One of the latest propositions is that of Dr. J. Grossman, a trial of which at Oldham, England, is said to have been very successful. The town has for years been compressing its sludge and filling low land with it, but all available land has now been filled. Dr. Grossman proposes to dispose of it as follows:

> By my method the expensive and disagreeable process of filter pressing is altogether eliminated. The settled sludge passes continuously and automatically into a specially constructed drying machine, which delivers it straight into a retort in a dry state, and in which it is mixed automatically with a small quantity of sulphuric acid and subjected to the action of superheated steam. The latter carries away with it all the greasy matter contained in the sludge. This is collected in tanks, and being rich in fatty acids finds a ready sale.
>
> The residue in the distillation retorts is discharged as a fine, dry, brownish powder, free from smell, and contains nitrogen, potash and phosphoric acid mixed up with humuslike earth, which renders it extremely valuable as a manure, being sterilized by the superheated steam. It is free from seeds, germs, or bacilli; it can be stored or used on land without creating a nuisance. The process is continuous and automatic, and thus very little manual labor is required.
>
> The sludge dried in my drying machine is so rich in fat and other combustible matter that mixed with a little coke it can be used as fuel for drying a further quantity of the sludge, and in that case a cake of the same consistency as obtained from the filter presses at a cost of 3s. 6d. for pressing alone can be produced at a cost of 9d. per ton. It is computed that 400,000 tons of soap are used every year in this country, practically all of which finds its way into the sewage, and the recovery of fat alone from that source is sufficient to effect a considerable saving in the present mode of sludge disposal. Besides this, my method yields a cheap manure, valuable for agricultural purposes, and obviates all the nuisance and danger to health arising now from present processes of sludge disposal.

All of which seems practicable, provided the sludge can be dried at a low enough cost. But this detail has so far proved the financial obstacle to success in all similar methods of utilizing sewage solids.

The building permits issued in New Westminster during the month of May totalled $[illegible] [illegible] in the history for any one month.

Concrete Blocks as a Building Material

Waterproof, Fireproof and Permanent Construction on Inexpensive Lines—Artistic Possibilities Use somewhat retarded by Unreasonably Strict City Ordinances

Specially Contributed by Robert F. Havlik*

Concrete is being used in nearly all construction work of to-day, but when the average man thinks of concrete in a building, he pictures a very massive structure in which this material is used for the foundations, floors or columns, and in many cases as being surrounded with a veneer of brick or terra cotta; he seldom thinks of it as being used where an artistic effect is desired.

When concrete block is mentioned the average person thinks of a material that is used for the foundation under frame houses. Occasionally we meet a broad minded man who concedes that the concrete block has great possibilities and who can seen wherein it can be used for producing very artistic effects.

In the use of concrete blocks, someone had to blaze the way, and as usual that very someone was naturally the venturesome spirit—the soldier of fortune,—who, with vivid imagination saw an easy way of making money—he overlooked the requirement of knowledge of the business, the ingredients, the mixture, moisture required, proper curing necessities, etc., hence there was produced the gray, unsightly, water-absorbing concrete block, the use of which, here and there, has caused condemnation and been held up to ridicule by those interests which are fighting everything that is concrete, because their toes are being so severely stepped upon. And still the way was blazed and the trail of the past few years has widened into so great an avenue of use that even with thousands of concrete block plants operated by men of brains, capital, and experience, the demand is immeasureably greater than the supply, and even against the fearful odds of past blunders, the properly made, artistic concrete block is making its wildfire sweep in both this and the old world.

Molsons Bank. Revelstoke, B. C ; architect, A. F. Dunlop, Montreal; contractors, Byers & Anglin, Montreal; cost complete, $20,950.

Residence of Thos. L. Dates, Owen Sound, Ont.; architect, L. C. Van Leyan, Detroit, Mich.; contractor, E. Martyn, London, Ont.; cost, $5,650.

No one questions the superiority of reinforced concrete over most building materials where immense strength and permanency are desired, and yet a great many people condemn the concrete building block as unsafe from a structural standpoint, not realizing that the concrete block can be made just as strong as reinforced concrete.

In spite of all that has been said against concrete blocks, the fact remains that they possess a great many advantages that no other materials have. It is only the uninformed that condemns the concrete block. This statement is made advisedly. Any informed person knows that concrete blocks, on account of being made as a small unit, can be inspected as often and as carefully as desired. They can be molded to produce any effect wished for; will permit of any color scheme, and also of figurated effects which would be out of the question in cut stone work, on account of prohibitive cost.

It is a well known fact that there are many buildings made of molded concrete products which look and are just as good as any cut stone buildings. Since this is true it is poor reasoning that will condemn the concrete block on account of the fact that some very inartistic buildings have been produced—buildings in which so called rock faced blocks have been used to the exclusion of all else.

There is no reason why all concrete blocks cannot be made just as good as the best. The mere fact that one or two buildings of reinforced concrete have failed, or that a number of buildings of brick have failed, does not condemn the use of either of these materials, and by the same process of reasoning similar failures of concrete blocks should not condemn their use.

---

*Engineer, Ideal Concrete Machinery Company, London, Ont. and South Bend, Ind.

The beautiful work which is being done with concrete blocks in different localities proves conclusively that molded concrete blocks are suitable for all classes of buildings.

Where common bricks have been used in the past, common unfaced concrete blocks can be used for the same purpose, and it will be found that they absorb less moisture than the common clay brick. Where better class bricks have been used, the ordinary faced concrete block can be used for the same purpose at much less expense. The same is true of pressed brick or tooled stone. Where they have been used in the past the fine grades of concrete blocks would be found fully as good, and in many respects better, and certainly far less expensive.

Nowadays there is much talk about waterproof structures. Years ago this was seldom thought of in brick and stone work, and yet, this is demanded wherever concrete is used. To meet this problem many waterproofings have been devised. Some of these are good, others are worthless. Wherever a manufacturer wishes to make an absolutely waterproof product, he can do so with proper care and selection of materials and the use of a reliable waterproofing.

No brick or stone is absolutely waterproof. Nearly all of these will absorb at least three per cent. of water, and many will absorb as much as fifteen to twenty per cent. when immersed in water. It is, therefore, evident that since a concrete building block can be produced that is absolutely waterproof, it certainly possesses a big advantage over all other building material.

Where a few years ago concrete blocks were used only for foundations or underground, they are now being used in some of the very best buildings, such as bank buildings, store buildings, costly residences, Carnegie libraries, etc. They form structures that are cool in summer and warm in winter, that can be made absolutely waterproof and that can be made in any shape or form desired. These facts should prove to the most sceptical that the concrete block has a great field and a great future.

A recent innovation in the concrete block is that of stucco applied to the same. For such purpose the concrete block is admirably adapted, inasmuch as it forms a structure that is fireproof throughout, permanent and comparatively inexpensive. Stucco blocks are made without facing and can be turned out at a very low cost. They require only one or two coats of stucco, whereas the building that is built of frame and covered with wood or metal lath usually requires three coats of stucco. Such buildings are not fireproof, inasmuch as a fire usually starts on the inside of a building, and this being the case, it would burn out the frame work and with this destroyed the outside shell would collapse, as it would not have sufficient strength to support the building. Thus, when concrete blocks are used for this purpose, the construction is improved immensely and the building is permanent.

Another innovation in this class of work is, that of white faced blocks and also the granite blocks. White faced blocks are being used quite extensively and closely resemble the natural light-colored sandstones and limestones; in fact, any natural stone effect can be reproduced in concrete blocks by the use of white cement and the proper aggregate for the facing.

The granite faced concrete block stands in a class by itself. Blocks so made meet the approval of any architect, and at the same time they are not an imitation of any other building material. They have an appearance that is distinctly characteristic of concrete. In such blocks the cement is washed or scrubbed away from the surface of the block, thus exposing the crushed granite. Similar effects can be produced by the use of other crushed stone or specially selected pebbles.

Much has been said against the use of rock faced blocks, and justly so, but it is high time that we forget about the rock faced block and commend the use of bush hammered, small panel, plain, vertical and horizontal tooled blocks instead, inasmuch as they are being used very extensively at present. Some of the best buildings that have been put up in recent years are built of blocks of these designs.

The buildings shown in the accompanying views are only samples of the fine work that is being put up throughout the entire country of molded concrete building blocks. Under molded concrete building blocks I include all molded concrete products, whether they be hollow or solid blocks, or ornamental products, as what is true of one is equally true of the other.

In large cities the use of concrete building blocks is hindered a great deal on account of the very strict ordinances regulating their use. This, I am sure, is due more to lack of knowledge of the strength of concrete building blocks than to a wish to favor some other building material.

Where this question has been investigated, cities have adopted ordinances requiring a crushing strength of 1,000 lbs. per square inch of net cross sectional area of the block as used in a building. This is absolutely fair and all blocks should conform to this specification, but when they do there is no reason why such blocks, 8 inches thick and with not over 33 per cent. air space, should not be used in buildings of any reasonable hight, providing the proper factor of safety is used in figuring the allowable loads on them.

Assuming a crushing strength of 1,000 lbs. per square inch of gross cross sectional area and a safety factor of 5, an ordinary building with bearing walls not over 25 feet apart, would have to be eight or nine storeys in height before the safe allowable loading on the blocks would be exceeded, and this is only true of blocks 28 days old. It is a well known fact that concreate increases in strength with age and as the blocks become older, say six months, there will be an increase of at least twenty per cent. in their strength, making the actual crushing strength at six months about 1,200 lbs. per square inch of gross area, thus still further increasing the factor of safety from five to six. As the blocks get older the factor of safety will continue to increase, so that the building is safer two or three years after it is put up than when it is first built.

The city of Winnipeg is making a special test of Westrumite paving with a view to specifying that material for a considerable amount of work. Alderman Douglas and other members of the Winnipeg Board of Works, recently paid a visit to Chicago and other cities where Westrumite is reported to be giving satisfaction.

Characteristics of Wood Stave Pipe

Features Worth Noting, With Some Examples of Use and Cost for Water Supply Notes on Pressure and Carrying Capacity*

By T. C. Hatton

There are two distinct forms of wood stave pipe in common use. One is termed "continuous" and the other "machine made." Both are built of the same character of wood, and the staves are of equal thickness for like pressures. Those built into "continuous" pipe are made of uniform thickness throughout their lengths, with a bead on one longitudinal edge and with a saw kerf at each transverse edge into which a metal plate is inserted to make a water tight joint. The bead on the longitudinal edge serves to make a water tight joint by being squeezed into the face of its neighboring stave when the iron bands surrounding the pipe are cinched up. The staves are made in unequal lengths to enable joints to be broken in constructing the pipe. The staves are held together by round iron or steel bands of such diameters and spacing as will retain the pressures required, each end of the bands passing through a malleable iron shoe and having a thread to which a nut is fitted. Thus the staves can be brought together so close that no leakage can occur unless it oozes through the grain of the wood.

This form of wood pipe is built in the trench, and from 16 in. to any diameter required, but is more comonly used for pipes over 24 ins. in diameter. It has one special feature well worth noting, if the pipe leaks at any point in the longitudinal joints, these leaks can be easily stopped by cinching up the bands near the leaks or if some defect shows up in the pipe line a few years after building, sections can be easily removed and replaced, by substituting new staves, or new bands.

The staves built into "machine made" wood pipe have two beads upon one longitudinal edge and two corresponding grooves in the other longitudinal edge. The beads are a little larger than the grooves, thus insuring their being totally filled and made water tight. At one end there is a tenon, cut 4 ins. long, where the staves are one-half the thickness of the balance of the walls of the pipe. On the other end there is a chamber cut 4 ins. deep. The tenon is smaller in diameter at the end than at the shoulder and when driven into the chamber makes a water tight joint, even though the two shoulders are not in perfect contact.

The staves are cut radially to correspond with the diameter of the pipe, and are held together by a steel band, steel wire or copper clad wire. This band or wire is wound spirally upon the pipe by a machine. The high tension produced by the machine squeezes the beads into the grooves making a longitudinal joint that cannot leak so long as the elastic limit of the band is not overcome.

Where steel is used for banding the pipe it is run through a bath of warm asphalt, which adheres to its surface, thus protecting it from any water which might ooze through the grains of the wood. After the pipe is wound, and the tenon and chamber cut, it is rolled in a bath of hot asphalt which adheres to the outside of the steel and wood protecting them from outside oxidizing agents. It is then rolled in a bed of sawdust. This sawdust enters into the asphalt and forms a protection for it in shipment and handling.

"Machine made" wood pipe are made in lengths from 5 to 12 feet and shipped to the work ready to be laid. They are laid by driving one piece into another until the two shoulders are in contact, or nearly so. No skilled labor is required; the inspector standing on top of the trench can readily observe whether the pipe has been driven home by observing the two shoulders. This form of pipe is made for diameters from 3 ins. to 36 ins. Either form can be laid around curves of from 90 to 200 ft. radius, according to the diameter of the pipe.

Withstands Pressure Up to 200 lbs.

One of the usual questions asked is, "What pressure can wood stave pipe safely withstand?" The proper reply to this is that the tensile strength of the material composing the bands represents the pressure the pipe will stand. Wood pipes are made to withstand pressures up to 200 lbs. per sq. in., so far as the writer knows. The more the pressure under which the pipes are subjected, the more steel or wire is required to band them together.

As the tensile strength and elastic limit of iron and steel are well known, it becomes a simple matter of computation to determine the gage and spacing of the bands to make a wood pipe which will withstand any pressure up to 200 lbs. Beyond this pressure it is likely the water would waste through the pores of the wood so that a higher pressure would not be economical or practicable.

The writer has experimented with wood pipe up to a direct pumping pressure of 300 lbs., without fracturing the pipe. This experiment was made to ascertain what a pipe built for pressures up to 100 lbs. would do if it was subjected to a water hammer equal to three times the pressure. At 250 lbs. the water oozed through the walls of the pipe. At 300 lbs. it spurted in small streams at a few of the longitudinal joints, with a few leaks at the transverse joints. The pressure was suddenly removed to nothing and gradually brought up to 100 lbs. with the result that the leaks stopped. This showed that, while the steel bands had been stretched, the elastic limit had not been overcome, and the pipe would, under such conditions as frequently exist in a long pipe line, safely withstand a wide range of pressures suddenly applied.

Pressures from 100 to 150 lbs. are common in machine made wood pipe, while continuous pipe of large diameter is successfully operating under pressures from 80 to 130 lbs.

Assuming that wood stave pipe is laid where it will be constantly subjected to water pressure the life of such is entirely dependent upon the life of the material with which it is banded. While the life is somewhat problematical there are well known illustrations where steel banded pipe has been in continuous operation for 50 years without apparent deterioration. While the writer has industriously made inquiries wherever such might be expected to give reliable information he has failed to learn of a single case where steel bands have given way on machine made pipe.

---

*Before the Annual Convention of the American Waterworks Association, June 1911.

The engineer who designs a continuous wood stave pipe provides for at least a factor of safety of 3 in. determining the size and spacing of his bands. The manufacture of machine made pipe provides for an equal factor of safety. Now when steel or iron corrodes it does so by pitting, and thus it is reasonable to assume that two-thirds of the cross-section of the steel can oxidize before the band will fail under ordinary conditions. From the writer's observation sheet steel, such as composes the bands of machine made wood pipe, pits in irregular spots, and never on a straight line, thus the band may be two-thirds gone before the pipe will fail.

Where oxidizing agents are known to exist, such as in salt marshes, through salt water or sulphur deposits, the pipe should be banded together with copper clad steel wire. This copper clad wire is cheaper than solid copper wire. It has an elastic limit of about 50,000 lbs. per sq. in., a tensile limit of about 90,000 to 100,000 lbs., and a coefficient of expansion less than two-thirds that of copper. Thus it becomes a product equal in strength with the steel and far better than copper. The writer knows of several cases where copper clad steel wire wound wood stave pipe has been successfully used where cast iron and steel pipe were very unsuccessful.

Carrying Capacity of Wood Pipe

The claim is made by wood pipe manufacturers that wood pipe has greater carrying capacity than cast iron pipe of equal diameter, and from a few well conducted experiments this claim seems reasonable. Marx, Wing and Hoskins conducted careful experiments to determine the coefficient of friction in wood pipes.* They found that coefficient n amounted to .009. Mr. Campbell on the El Paso and Southwestern Ry. pipe line, heretofore referred to, found the value of n in 13,200 ft. of 10-in. wood pipe to be .00866, and in 47,500 ft., of 16-in. wood pipe to be .0092.‡ Mr. Campbell had exceptional facilities for determining the true values of n which are rarely found in actual practice.

The value of n in new cast iron pipe has been determined repeatedly and found to be .012. From the results of these experiments it appears quite true that a wood pipe has greater capacity than cast iron of like diameter. For instance a 12-in. wood pipe with a loss of head of 8.85 ft. per 1,000 will carry approximately 2,025 gals. per minute, whereas a new 12-in. cast iron pipe under the same loss of head will carry about 1,810 gals. per minute. A 30-in. wood pipe under a loss of head of 2.05 ft. per 1,000 will carry about 11,600 gals. per minute, whereas a 30-in. cast iron pipe under the same head will carry about 8,810 gals. per minute. The longer the cast iron pipe is used the less its carrying capacity, under frequent conditions. The capacity of wood pipe does not diminish with age, the inside perimeter becoming smoother from use.

So far as the writer's knowledge goes there have been very few well conducted observations made of the leakage from wood pipe lines. From general observations made by the writer of lines in operation, no leaks of any significance have been apparent. Mr. Campbell, however, conducted careful observations on his lines, and states that, after two years, there was no material leakage in the 10 miles of 10-in. and 16-in. wood pipe line between the source of supply and the reservoir, which pipe was working under a maximum pressure of 130 lbs. That in the 12.6 miles of 11-in. and 12-in. pipe lines below the reservoir, and subjected to a less pressure, the 11-in. line leaked 17.046 gals. per mile and the 12-in. about 3.702 gals. per mile. Along the railway, when the maxium pressure was 130 pounds the 11-in. pipe leaked 120 gals. per mile, and 8½-in. and 7½-in. pipe leaked 268 gals. per mile. It occurs to the writer's mind that if there were 103.4 miles of wood pipe in this installation wherein the maximum leakage was 268 gals. per mile, and 8.6 miles wherein the leakage amounted to 17,046 gals. per mile, there must have been some defective joints or pipes in the latter section which needed looking after, that if 90 per cent. of the whole line was practically water tight, the other 10 per cent. could easily be made so. However, from the result of the careful observations made by Mr. Campbell, it seems reasonable to assume that wood pipe, properly made and laid, can be made water tight under a pressure of at least 130 lbs.

This subject may be concluded by considering the difference in cost in installing wood stave and cast iron pipe. The difference is made up of several items, as, for instance: the cost of the two characters of pipe delivered f.o.b. cars at nearest railway point. Hauling pipe alongside of trench, width and depth of trench. Laying pipe, etc.

The difference in cost of furnishing and delivering the two characters of pipe at railway points is largely dependent upon the difference in diameters of the pipes to be used. The larger the diameter the greater the difference. The differenc in wights per foot of pipe also increases in direct ratio to the increase in diameters. Therefore the cost of transporting wood pipe from railway to trench is from one-third for wood pipe 8 ins. in diameter to one-sixth for wood pipe 30 ins. in diameter of the cost of transporting cast iron. To overcome frost conditions the wood pipe need not be built as deep as cast iron pipe, as wood is a good non-conductor and can be laid closer to the surface of the ground without being damaged by frost. In laying wood pipe no bell holes are necessary, and this item of cost is eliminated, which, in rock excavations, becomes a very important item. As there is no lead and hemp used in laying wood pipe these items of cost are eliminated, as is the cost of melting lead, transporting and furnishing fuel, and caulking joints.

While it is impossible to compile a table showing the difference of cost between furnishing and laying the two characters of pipe which will fit conditions existing generally, it can easily be determined at a glance that there is a difference in favor of wood pipe; that this difference depends upon the size of the pipe, and that it can easily be determined for each locality when freight and labor charges are known.

Examples of Cost

A few instances of known costs might be interesting. The 23 miles of 30-in. continuous wood stave pipe laid for supplying Yynchburg, Va., with water, under the direction of Mr. James H. Fuertes, M. Am. Soc. E. E., cost, for furnishing and laying pipe, exclusive of trenching and backfilling [illegible]

$2.10 per lin. ft., depending upon spacing of bands. This wood was shipped from the Pacific Coast at a freight rate approximately $300 per car.

The 42-in. continuous wod stave pipe laid at a supply main for the Atlantic City Water Works, under the direction of Mr. Kenneth Allen, M. Am. Soc. C. E., cost, exclusive of trenching and backfilling, $2.25 per lin. ft.

The 42-in. continuous made pipe line laid under direction of the writer for Carney's Point, N. J., cost, exclusive of trenching and backfilling, $1.32 per lin. ft.

Comparing the above costs with the cost of cast iron pipe of equal diameter, delivered f.o.b. cars at railway point, and the cost of lead and hemp for making joints, omitting transportation charges from railway to trench, laying charges, extra excavation for bell holes, fuel for lead melting, caulking and handling cast iron pipes.

The 42-in. cast iron pipe would cost at $22 per per ton	$6.11
The 30-in. cast iron pipe would cost at $22 per ton	3.47
The 24-in. cast iron pipe would cost at $22 per ton	2.43

The difference in cost of laying wood and cast iron pipe including trenching and backfilling, and under exactly the same conditions, is well set forth in Mr. Campbell's paper above referred to.

He states that the 384,300 ft. of wood pipe from 11 to 3½ inches in diameter were laid at an average cost of $0.0472 per lin. ft., whereas the 101,200 ft. of 12-in. cast iron pipe, including lead and hemp, were laid at an average cost of $0.2343 per lin ft.

It is not the writer's purpose to recommend to his colleague, who may be interested in laying supply mains, for water works, wood stave pipe under all conditions, but to suggest that, after knowing the conditions, he look into the advisability of using wood stave pipe, study its applicability to the existing conditions, including the comparative cost with cast iron or steel pipe, keeping his mind open to recommending the installation which will best suit the conditions, and he will find many circumstances when he can save his client's money and secure for him equal service.

Reinforcement of Steel Just Beneath the Top Surface

We are accustomed to think of concrete pavements as being of very recent development, yet in 1885 Codrington, the British authority, published the following in the Encyclopaedia Brittanica:

"Concrete macadam, formed by grouting with lime or cement mortar a coat of broken stone laid over a bed of stone previously well rolled, has been tried as an improvement on an ordinary macadamized surface, but not hitherto with much success."

Concrete, or concrete macadam, is an ideal pavement in many respects, but, due to its comparatively slight tensile strength, the surface is apt to become pitted with holes when subjected to heavy traffic. Once the pitting starts, wear is very rapid, for the edges of a chuck hole in concrete crumble away with greatest ease. It is this that accounts for the very slow progress that concrete has made as a wearing coat for pavements.

The writer has made a number of experiments with concrete slabs reinforced just below the surface with wire mesh and expanded metal. Concrete slabs thus reinforced show far greater resistance to impacts of hammers or chisels than concrete not provided with surface reinforcement. This fact, coupled with a consideration of the theory of impact stresses upon a surface stratum, leads the writer to believe that great progress in concrete roadway construction may occur if subsurface reinforcement, as we may term it, shall be applied. This subsurface reinforcement, be it understood, in nowise resembles the reinforcement that concrete slabs are given on the lower side, for the object of that is to take the tensile stresses that occur when the slab acts like a beam. The subsurface reinforcement which we suggest is of an entirely different nature. Its object is to distribute surface impact stresses over an area of concrete sufficiently large to prevent rupture of the surface, and the consequent formation of pits or chuck holes. Morover, even were pitting to occur, such a subsurface reinforcement would prevent the rapid enlargement of the hole.

In considering the various forms of subsurface reinforcement, it has seemed to the writer that herringbone lath offers an excellent shape for the purpose. Possibly a corrugated wire mesh or an expanded metal bent so as to form close rows of pyramidal points would serve better. This is a matter for experiment under traffic conditions.

The objection has been raised that when the concrete wears down sufficiently to expose such a reinforcement, the steel would quickly wear so as to leave projecting "spikes" that would injure rubber tires. This objection would probably be met by applying a fresh layer of cement mortar to replace the worn out concrete. The use of a wash, like "Ransomite," would serve to bond the new mortar to the old. Concrete, however, does not wear with rapidity, except by crumbling from the edges; and if the formation of holes could be prevented by subsurface reinforcement a long life would be reasonably certain.

In a recent consular report mention was made of a foreign pavement consisting of small steel fragments (turnings from lathes, etc.) and cement mortar, which was said to possess great resistance to destruction under traffic. Such a pavement is, in a way, a concrete having a subsurface reinforcement, but of a kind that might be too expensive for general use.

Concrete railway ties have frequently failed because of the crumbling of the concrete directly under the rail. This too might be prevented by a subsurface reinforcement of the kind here suggested.—Engineering and Contracting.

Col. Geo. W. Goethals, chief engineer of the Isthmian Canal, had a pet parrot which he admired greatly because of its cleverness and remarkable qualities. The parrot, however, had an embarrassing habit of repeating remarks it heard, and besides had a noisy and boisterous disposition. One day when it had been particularly boisterous, Colonel Goethal's negro attendant overheard the colonel say: "You old bird I'll have you fried if you don't stop talking." The next day when the colonel sat down to luncheon he had what appeared to be a fried chicken placed before him. "This chicken has a queer taste," he said to his negro, when he sampled it. "Dat ain't no chicken, boss," the negro replied; "dat's dat 'er parrot. It didn't stop talkin'."

Erection of Steel Towers for Hydro-Electric Power Commission

The Hydro-Electric Power Commission transmission line from Niagara Falls to Toronto enters the latter city from the west, passing along the north shore of Lake Ontario, thence across the easterly end of Humber Bay and through the National Industrial Exhibition grounds to the sub-station at the foot of Strachan avenue. This route involved the construction of eighteen towers in Lake Ontario in from three to six feet of water. With the exception of four towers, which were somewhat protected by the sea wall recently completed by the city of Toronto, the work was exposed to the severe storms that occur in this locality.

The line is carried on steel towers from 200 to 350 feet apart, each tower being carried on four concrete pedestals, eight feet square at the base, three feet square at the top, and rising to a height of fifteen feet above the normal level of the lake. Except for those towers protected by the sea wall, and in a few instances in which hardpan was encountered, the concrete pedestals are carried down to rock, and the spaces between and around each of the four pedestals forming a set are filled with heavy rip-rap, as an additional protection against the heavy ice which forms along the shore of the lake. Each pedestal is reinforced with 1 in. square rods running from top to bottom, and the corners towards the lake are protected by 4 in. x 4 in. angles bedded in the concrete.

Completed steel tower

On account of the danger from storms, as much as possible of the work was carried on from the shore, the material being transported to the work over light wooden trestles. Concrete mixers and boilers were erected at points along the shore and were moved from time to time as the work progressed. These boilers also supplied steam to the syphons used for unwatering the cofferdams. By adopting this method of carrying out the work, the contractors, the Foundation Company, Limited, were comparatively independent of weather conditions, having nothing out in the lake that could not be replaced quickly if carried away by storms. The wisdom of this policy was amply proved by the fact that several storms were passed through without serious delay to the work or loss to the contractors.

The ground overlying the rock was composed of boulders, gravel, sand and clay. The open cofferdam method was adopted, the cofferdams being constructed of 2 in. T. & G. sheeting braced on the inside by 6 in. x 6 in. rangers, with 4 in. x 6 in. outside walings to serve as guides while the sheeting was being driven. They were floated into place and weighted down with bags of sand and rip-rap. After the sheeting had been driven, the outside was puddled with clay handled by scows which were loaded at the cliffs along the shore. This type of cofferdam was used by the contractor for the nine easterly towers which, being exposed to the most severe storms, were carried down to rock or hardpan. No trouble was experienced in unwatering the cofferdams so that the rock could be properly cleaned and the concrete deposited in the dry.

Weighting and puddling cofferdam

In the face of the many difficulties and unfavor-

Contractor's plant on Cliff Road

Erecting forms at tower [illegible]

able weather, the work was completed in remarkably short time, nothwithstanding about two weeks' delay at the commencement of the work on account of changes in location of the towers.

The nine easterly towers were constructed by the Foundation Company, Limited, Bank of Ottawa Building, Montreal, for the F. H. McGuigan Construction Company, general contractors.

Efflorescence on Brickwork

The film of earthly salts which frequently appears on the surface of brickwork, and is known as efflorescence, detracts considerably from the pleasing appearance of the work, while the crystallisation of salts within the pores of the bricks tends to cause disintegration by action akin to that established by frost. Moreover, efflorescence may cause damp places on the structure affected, destroying plaster and paint applied after the process has commenced.

Efflorescence may be due to the presence of undesirable material either in the bricks or the mortar, or in both. Although far more common on quite new than on older walls, the deposit may be formed on any brick surfaces liable to be affected by the infiltration of water, and is always at its worst near eaves, rainwater heads, window sills, and other places where rain is afforded opportunity for soaking into the bricks.

The deposit is generally white, but may be yellow or green, according to the composition of the clay used in brickmaking. It is merely a film of soluble salts carried by water from the interior to the exterior of the bricks, and made evident by crystallisation on evaporation of the water.

Chemical analysis shows that the composition of the crystals varies considerably according to circumstances. They generally consist of sulphates, such as potassium sulphate (K^2SO^4), sodium sulphate (Na^2SO^4), calcium sulphate ($CaSO^4$), magnesium sulphate ($MgSO^4$). In bricks made from clay found near the sea, chlorides are sometimes present, as potassium chloride (KCl) and sodium chloride (NaCl); while other clays furnish compounds such as potassium carbonate (K^2CO^3), sodium carbonate Na^2CO^3), sodium nitrate ($NaNO^3$), ferrous sulphate ($FeSO^4$), and aluminum sulphate (Al^23SO^4).

With the exception of calcium sulphate, all the salts mentioned are readily soluble in water, most of them exceedingly so, as may be seen by the following table:—

Salt	Solubility in cold water		
Potassium sulphate	1	in	12
Potassium chloride	1	in	3
Potassium carbonate	1	in	1
Sodium sulphate	1.18	in	1
Sodium chloride	1	in	3
Sodium carbonate	1	in	2
Sodium nitrate	1	in	1
Calcium sulphate	1	in	500
Magnesium sulphate	1	in	3
Ferrous sulphate	1	in	2
Aluminum sulphate	1	in	2

Notwithstanding the relative insolubility of calcium sulphate, this compound is the most fruitful cause of efflorescence, which is far less readily washed off by rain than that resulting from the more soluble salts.

The existence of efflorescent substances in bricks is due to one or more of the following conditions:—

(1) The use of clay containing soluble salts.

(2) The use of clay tempering water containing soluble salts.

(3) The formation in the kilns of soluble salts by the oxidation of minerals in the clay, or by the reaction of sulphurous kiln gases on the clay.

(4) The introduction of soluble salts into the bricks after burning, generally from the mortar employed.

Surface clays usually exhibit a higher percentage of earthly salts than other deposits, and the same may be said of clay which has been covered by sea water, clay containing iron pyrites, or ferric desulphide (FeS^2) being another undesirable variety.

Even in cases where the clay is of approved quality, foreign substances of deleterious character are sometimes introduced which result in the formation of salts giving rise to efflorescence. One example of such treatment is the use of ashes with the object of preventing shrinkage, and another is the adoption of sulphurous coal for burning.

It also happens occasionally that kiln-burnt bricks are impregnated with soluble salts either in consequence of badly-designed plant, or of inefficient management. Thus, after the dried bricks have been "crowded" into the kiln and the process of heating up has been commenced, if the fires are kept only just high enough to evaporate the moisture in proportion to the chimney draught, the process is unattended with prejudicial conditions. But if the moisture is evaporated too rapidly for the capacity of the shaft, the surplus vapour in contact with the bricks may absorb sulphur from the gases, resulting in the formation of sulphuric acid, which by combination with the carbonates and other salts will give rise to soluble sulphates, the most general cause of efflorescence.

Various methods are adopted for eliminating substances calculated to give unsatisfactory results. In clays capable of vitrification the risk of efflorescence can be obviated by thoroughly vitrifying the bricks, and thereby converting objectionable salts into permanent silicates.

Clays known to contain soluble earthy salts can be rendered harmless by washing, but this method is commercially impracticable in the case of low-priced bricks. By exposing such clays to the weather for six months or more, rain and snow are utilized as cleansing agents, although it must be noted that this mode of treatment may have the effect of converting insoluble into soluble salts.

Chemical treatment is a more scientific expedient, performed in the case of clays prepared by the wet process by adding to the water used in the washmill such chemicals as will react upon the soluble sulphates and precipitate harmless compounds, the chemicals most generally employed being barium chloride and carbonate resulting in the precipitation of barium sulphate ($BaSO^4$), which is the only soluble to the extent of 1 part in 400,000 parts of water by weight. Even if soluble sodium salts are present, they would simply be converted into carbonate or chloride by the corresponding barium compounds, and being very soluble these salts would be removed by rain quite readily if brought out by efflorescence on the surface of brickwork.

Chemical examination and purification of the water used in brickmaking are quite as necessary as treatment of the clay. Being perfectly simple and very inexpensive, the operation should never be neglected as good clays are frequently contaminated by saline water.

Efflorescence resulting from the introduction of soluble salts into the bricks after burning is usually due to the use in mortar of lime containing magnesia and other bases, which enter into combination with sulphur in the fuel employed for calcination, and form soluble sulphates. These are dissolved by water during the process of mortar mixing, and often find their way into the bricks, emerging later as efflorescence. Similar trouble may also be occasioned by the action of sulphurous gases from coal and coke burned in stoves for warming buildings, the effect being to form sulphates which may appear on the surface of the exterior brickwork.

From the foregoing it is evident that efflorescence can be absolutely avoided by the employment of suitable bricks and mortar, by taking care to see that roofs, cornices, and gutters are watertight, and by preventing leakage of any kind from steam and water pipes in ducts within the walls.

In cases when efflorescence occurs despite all reasonable precautions, the first thing to do is to stop any leakage of water into the brickwork, and if the trouble is caused by the penetration of rain from the outside the surface may be treated by the application of alternate washes of soap and alum solutions, the former in the proportions of 2.2 lb. of hard soap per gallon of water, and the latter in the proportions of 1 lb. of alum per gallon of water. Instead of using common alum or potassium aluminum sulphate ($K^2Al^24SO^4$) it is more economical and at the same time more efficacious to employ aluminum sulphate (Al^23SO^4) in the alum wash.

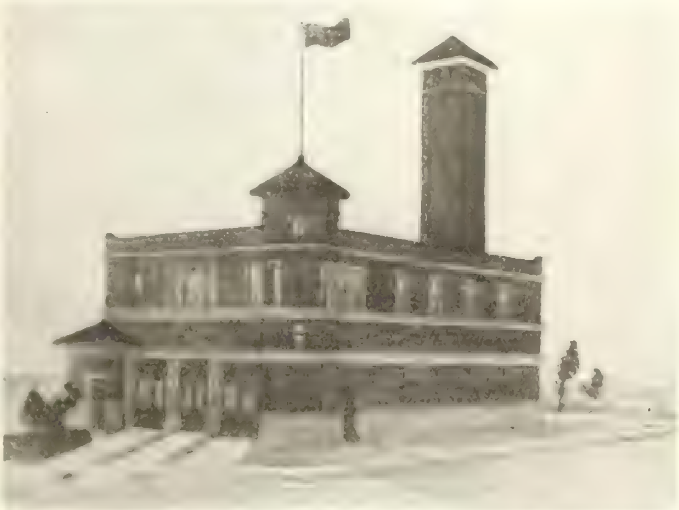
Surface deposits due to calcium sulphate, and, therefore, not carried away by rain, can be removed by scrubbing the face of the work with hydrochloric acid diluted with about five times its volume of water. Before the acid is applied the brickwork should be thoroughly moistened, and all traces of acid removed, after treatment, by washing the surface with water.

A reinforced concrete ice house was recently erected in Philadelphia with sheet cork as the insulation throughout, instead of wood and mill shavings, sawdust, and the like, which have generally been used. The insulation of the ceiling consists of 3-in. cork boards, attached with cement to the under side of the reinforced concrete slab. The walls are insulated with two layers of 2-in. cork boards, with all joints broken; and the floors with two layers, laid in hot asphalt on a concrete base. The finish on the sheet cork and walls and ceiling is Portland cement; for the floor finish a concrete and cement floor is laid directly on the cork.

The Rydal Bank bridge over the Thessalon River was the largest of the works undertaken last season by the Ontario Department of Public Works. It consists of a steel span 120 feet long, and a concrete trestle approach at each end 30 feet long, making the overall length 210 feet. The steel span is supported on concrete columns which rest on a concrete base constructed in 8 feet of water. The bottom is soft and treacherous, and a pile foundation had to be provided for the piers. An 18 in. curtain wall is constructed between the concrete columns to carry the steel floor joist and the concrete beams of the approach. The approaches have a 6 inch concrete floor, supported by concrete beams, which rest on the piers and light shore abutments. The two middle beams are 16 inches wide and 24 inches deep. The beams are reinforced with Kahn bars, supplied by the Trussed Concrete Steel Company, of Walkerville, at a cost of $268. The concrete floor of the bridge is reinforced with expanded metal. The steel span was supplied and erected by the Dickson Bridge Works Company, of Campbellford, at a cost of $3,010. The pile foundations were prepared and the concrete work, the laying of the floor, and the grading done under the supervision of J. O. Coates, Foreman Public Works. The full cost of the bridge will amount to $10,000.

Proposed New Fire Station at Westmount

The accompanying illustrations are reproduced from the preliminary plans for the proposed Upper Level Fire Station at Westmount, Que. Plans were prepared by Mr. Archibald Currie, city surveyor, and the first sod was cut by Alderman Jones, chairman of the fire committee, on the 13th inst. The excavation is being done by the City Surveyor's department Working drawings and specifications are now being prepared and tenders for the erection of the building will be called for in about a couple of weeks. The building, as a whole, will be of fireproof construction, steel and brick. The exterior will be of brick and Roman stone. The ground floor will be used entirely for fire wagons, including one automobile wagon. Accommodation is provided for eight horses. There is also a general office at the southeast corner of this floor. On the second floor quarters are provided for the officer in charge, these consisting of five rooms and bath apartments. The accommodation for the men includes a large reception and billiard room, reading room, action room, four bedrooms, lavatory, showers, etc. The hose tower is shown at the rear of the building.



Proposed Firehall at Westmount, Que.

Mr. W. H. Cushing, of Calgary, states that he considers the present year will establish a new record for consumption of lumber on the prairies, the demand now being large and likely to increase after the harvest. In regard to Alberta he never saw better crop prospects than at the present time, and the amount under acreage is greater than last year by close to twenty per cent.

Reinforced Brickwork

The pioneer of reinforced brickwork was Cottancin, a French engineer. More recently the claims of reinforced brickwork have been advocated by two or three specialist firms and used with considerable advantage in the construction of walls and floors in industrial and other buildings. The latest application of the same principle is exemplified by various river and canal banks in France, which are faced with reinforced brickwork, as illustrated in Figs. 1 and 2. The bricks are pierced by two holes for galvanized iron or copper wires, and are set as follows:—The slope to be protected is finished to the required gradient, and the reinforcing wires are secured to a cable stretched along the bottom of the slope. The free end of each wire is then attached to a horizontal frame at the top of the slope, where the bricks are threaded on the wires and slid down to the bricklayers. When the work has passed beyond reach from ground level the layers stand upon a small platform, as shown in Fig. 1, and on completion of the facing the upper ends of the wires are securely anchored The system of reinforced brickwork here briefly described has been adopted on the Ile des Ravageurs at Asnieres, on the Sensee Canal, near Aneux, and in the Vaux Valley near Pontoise. It has also been found useful as a means of protecting sand-dunes at the Pointe de Grave and at Sonlac.

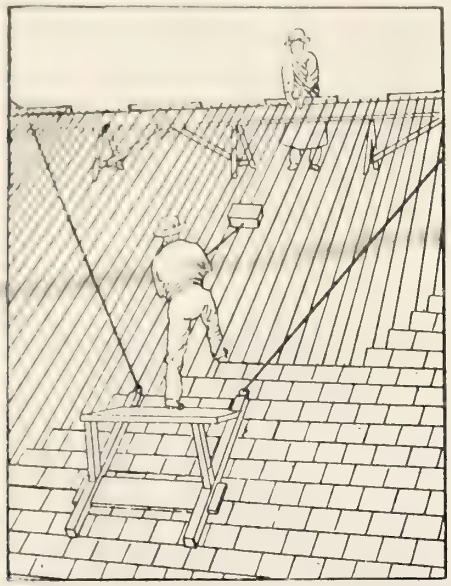


Fig. 1—Laying Reinforced Brick Slope.

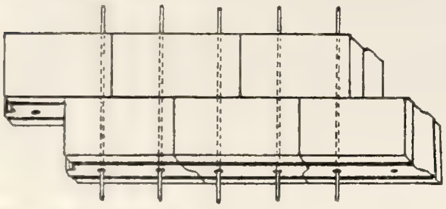


Fig. 2 Details of Reinforced Brickwork.

Machine for Breaking Up Concrete Road Bases

A machine for breaking up concrete road bases which, it is claimed, can do the work of 20 men in about a quarter of the time required for hand labor, has lately been built in England. In cases where concrete bases 12 to 18 in. thick have to be broken up by manual labor the length of time the traffic is interrupted becomes a very serious consideration, according to "Engineering," and the new machine is designed to meet just this condition. The framework of the machine is mounted on 9-in. rollers and supports a steam hammer which can be moved transversely or longitudinally, as may be required, by means of hand-operated screws. The frame is 12 ft. long, and can accommodate 24 chisels in all, spaced 12 in. apart longitudinally and 18 in. apart laterally. These chisels are held in place by cross-bars inserted in the framework and so tapered that a tap with a hammer on the thin end immediately releases the bar, when it can be withdrawn and the chisel lowered to within a few inches of the road surface. The frame can be raised or lowered as required, by means of vertical screws on the rollers, worked by hand, the arrangement being such that when the machine is drawn from point to point the wheels are screwed down so that the frame clears the roadway by a sufficent distance. When ready for use the machine is placed in position and the framework lowered so that the girders rest on the roadway. The chisels are then placed in position and the steam applied to the hammer by a flexible pipe attached to either a boiler on a separate carriage or to the boiler of a small traction engine used for conveying the machine from point to point.

The weight of the hammer adopted in the present disign is 400 lb.; the cylinder is 8 in. in diameter and has a length of 38 in., which will allow an initial stroke of 1 ft. 3 in. when driving a chisel 2 ft. long. By this arrangement the force of the blow gradually increases as the chisel is driven down, owing to the increase travel of the piston, which moves under a constant steam pressure of 70 lb. per square inch. The power is considered to be more than ample for driving a cold steel chisel, say 4 in. square, into concrete. When all the chisels required are driven home the machine is moved further along the road and takes up a new position for the next cutting operation. The chisels that have been driven in are then removed. If these chisels should become fixed in any part of the concrete not properly broken up they can be easily removed by the use of hand-hammers. The machine has an overall width of 6 ft. 6 in.; a total length of 14 ft. 9 in., and weight 5 tons.

The Magnetawan River bridge, at Perry Township, Ontario, is a single steel span, 50 feet long, with a concrete approach span 26 feet long at each end. The floor is concrete, 102 feet long over all. The bridge trusses rest on concrete pedestals 3 feet square; the steel joists are supported by a curtain wall between the pedestals; the shore ends of the concrete beams rest on small abutments. There are no wing walls used, and the earth is allowed to fall to a natural slope. This form of construction was found to be more economical than using heavy abutments and wing walls. The concrete approach consists of four reinforced concrete beams 24 inches in depth. The two centre beams are 16 inches wide, and the outside beams 14 inches wide. The beams are reinforced with one-inch twisted steel bars, and the 6-inch concrete floor is reinforced with No. 6 expanded metal mesh. The steel span was supplied by the Western Bridge and Equipment Company, of Chatham, for $750. The reinforcing cost $118, and the substructure, concrete approaches, grading, etc., cost $1,598. The work was carried out under the supervision of J. W. Hackner, civil engineer.

Comparative Merits of Steel and Cast Iron Pipe *

By Allen Hazen

That which follows relates only to large mains, which I shall define provisionally as mains 36 in. in diameter and larger. About twenty years ago steel plates became available in large sizes and at comparatively low prices, and these at once largely replaced wrought-iron for such pipes. Pipes made from steel plates had advantages and soon found entended application in the construction of the large water mains that were then demanded in increasing numbers to meet the needs of growing populations and the increased per capita use of water.

From that time to the present the relative merits of cast-iron and steel for large water pipes has been discussed. Much has been said upon both sides. The author will not attempt to enumerate all the arguments that have been used, but only to present the salient features of the case as they present themselves to him, under the conditions that now exist in the northeastern states.

Steel costs more per pound than cast-iron, but it is stronger and in some respects more reliable. A steel pipe ¼-in. thick may be, and often is, stronger than a cast-iron pipe 1 in. thick, and is commonly cheaper. When steel has replaced cast-iron in pipe it has simply done what steel has done in a hundred other directions in buildings, in machinery, and wherever a higher form of metal has advantages more than commensurate with its increased cost.

In the past a comparison of the two materials for large pipe lines has often rested upon a consideration of the relative durabilities, real or supposed, taken in connection with the relative costs. The steel pipe has been assumed to be less durable, because the metal was thinner and would rust through quicker. But it was much cheaper. For instance at Springfield (Mass.) for twelve miles of 42-in. pipe for which competitive bids for steel and cast-iron pipe were obtained in 1908 the relative costs were in the ratio of 2 for steel to 3 for cast-iron. Cast-iron would have cost $600,000. It was actually laid in steel at a cost of $400,000. This ratio is probably not far out of the approximate relative costs of the two materials for large pipes under considerable pressures under the conditions that have ruled in the last few years.

The matter has frequently been presented in this way: the money saved by using steel pipe in a certain case, amounting let us say to one-third of what would be the cost of a cast-iron pipe line, of 50 per cent. of the cost of the steel pipe line, if put at interest at prevailing rates would amount to enough to lay a new line of steel pipe at the expiration of some arbitrary period for which it is assumed that the steel pipe will last. The period assumed in making this calculation has seldom been less than 25 years or more than 40 years. In many cases this calculation has been made and the steel pipe has been put in with the belief that it was better business to use it even though it rusted through and ceased to be serviceable at the end of the relatively short period assumed for its life.

Large pipes, as defined in this paper, are most frequently used in the supply pipes of a water-works system, and less frequently in the distribution, and in such supply mains other conditions than the wearing out or loss of strength of the metal commonly limit the useful life of the pipe

Reduction in pipe capacity and increase in (water) demand limit the time that a given pipe will by itself perform the functions for which it was laid, and when, because of these, it ceases to be able to perform its work another line may be laid to help it out. When this oicurs the first line may be considered to have lost a part of its value, and it may then be worth only the difference between what it would cost to lay a new main to supply the whole service in connection with it. This will commonly be only a fraction of first cost. Much of the value is then gone although the pipe may be physically sound.

These practical considerations in most cases limit the full useful life of steel and cast-iron pipe in supply mains of growing cities to periods below the term during which the shell is sound.

The oldest steel pipe lines now in use are about twenty years old. They are still in good condition. Little has been spent upon them for repairs, and there is every prospect that they will continue in useful service for a long time. Curiously, it is some of the more recently laid lines that have given most trouble from deterioriation.

Liability to Perforation of Steel Pipe

The weakness of a well-made steel pipe is its liability to perforation. The experience of the last years has emphasized this, and recognition of a weakness is the first step in correction it.

Perforations of steel pipe are caused in two ways:

(1) Mechanically. The escape of a small quantity of water through an accidental opening (at a high velocity because the pressure in the pipe is great) results in eddy action on the outside of the pipe which gathers grains of sand and brings them forcibly against the outside of the pipe, and in a comparatively short time cuts the steel and makes a perforation of sufficient size to be an important leak.

The remedy is to test the pipe under more than full pressure before the trench is backfilled, to calk it tight and to make the joints so substantial that there will not be chance for openings to occur.

(2) Chemically. It is a curious property of steel plates that corrosion is not equally distributed, but is concentrated in small places. Once in a while there is a place which for some reason corrodes more rapidly than the rest of the plate, and where finally the steel will be eaten entirely through, making an opening which allows the escape of water. There is clearly some imperfection in the steel plate which allows the corrision to take place which finally results in perforation, while 99 per cent. of the surface of the plate remains entirely free from deep corrision.

The writer believes that in many cases there is a reason for preferring steel to cast-iron which is more important than the saving in cost, namely, the greater strength and reliability of steel. This greater reliability is due largely to the fact that steel is malleable, and therefore capable of being bent and deformed by settlement in the trench and movements under external forces without breaking or reduction in strength, whereas corresponding forces acting upon cast-iron pipe would break it.

Cast-iron pipe in the past has been commonly designed with a thickness of wall sufficient to resist, at an assumed tensile strength, and with an assumed factor of safety, the internal pressure of the water in the pipe, with a further allowance for water ram, and generally with a further arbitrary addition to the thickness of the walls to cover inequalities in casting.

The actual test and proof of the formulas that have been used in making this calculation is that the pipe designed by them has in general been satisfactory in service, and the percentage of breakage in actual use has been small.

It is to be noted, however, that most of the experience relied upon in reaching this conclusion relates to pipes smaller than 36 ins. in diameter. That relating to large cast-iron pipes, although considerable, is by no means as great.

It now seems that the forces taken into account in the

---

* Before the American Waterworks Association

formula are not the only ones that tend to break and that do break cast-iron pipe. In addition, there are internal stresses due to the unequal cooling of the casting; there are stresses that grow out of the fact that the pipe is unevenly supported along its length and acts as a beam between points of support, and especially there is the weight of the backfill in the trench carried on the top of the pipe and transmitted through the sides of the pipe to the material underneath. The tendency of this load is to break the pipe.

Analysis of Stress

Prof. Talbot of the University of Illinois has investigated the amount of stress produced by fill on pipes of cast-iron and other materials by embedding them in sand and loading them to the point of destruction, and has recorded amounts of load or fill required to break them under various conditions.

The important matter for us in that the stesses that result from these other forces are cumulative to a considerable extent with those resulting from the internal pressure of the water in the pipe.

In a paper recently presented to the New England Water Works Association I attempted to analyze some of these stresses. I will not repeat at this time what is there printed; it will suffice to say that the stresses resulting from the load of backfill are important in pipes of large sizes and make a difference in the thickness of walls required. In other words, large cast-iron pipe designed by the formulas that have been used are not as strong in proportion as small pipe designed by the same formula.

Practical experience seems to bear this out, for there have been relatively more breaks in large cast-iron water pipes than in small ones. Statistics are not easily obtained of sufficient completeness to be of value, but I think almost any water-works superintendent who has had 48-in. or 60-in. cast-iron pipe in his system, or even 42-in. pipe, will support the proposition that the destructive breakage of such pipe has been greater proportionately than with small pipe.

Further, the possibilities of damage with breaks in the large pipes are greater. It is possible in a few minutes to do thousands of dollars worth of damage by one break in a large pipe in a populous district.

Although steel pipes have been designed with nominal factors of safety no greater than those used for cast-iron pipe, when all the conditions are taken into account the actual factors of safety have been greater. With hundreds of miles of steel pipe in service in the last twenty years, nearly all of it in large sizes, there have been but few recorded breaks, and, so far as the author knows, not a single case of a break of a destructive character; no such record can be shown for cast-iron pipe.

With cast-iron pipe, in case of breakage the side of a pipe blows out, and all the water that the pipe is capable of carrying is discharged until the reservoir is exhausted or the supply shut off. On the other hand, the few breaks that have occurred with steel pipe have resulted in comparatively small openings which allowed the escape of some water, but not by any means the full discharging capacity of the pipe.

The perforations of steel pipe that have sometimes occurred and that have been much talked about in the last years, resulting from the rusting or other corrosion of the metal and going entirely through the plate in some cases, result in a relatively small leak which does not interfere with the continued operation of the pipe, and which leak can be easily, completely and permanently repaired without shutting the water off.

It is to be noted that such breaks as have occurred in steel pipes most frequently during laying or preliminary testing, and less frequently in lines in actual service, have occurred, as far as the author knows, always where plates or lock bars or some other part was of steel that was relatively hard. The mild steel is the most malleable, and although it has the lowest tensile strength it makes the most reliable pipe. If there is breakage or trouble look out for hard steel that has escaped the inspector, or that was near the upper limit of tensile strength allowed under the specifications. For the greatest safety use soft steel.

Steel pipe is made at the present time in two principal patterns, namely, with double-rivited joints and with lock-bar joints. The lock-bar pipe is believed to be fully equivalent in smoothness to cast-iron pipe, and will carry the same amount of water as cast-iron pipe of the same size. Double-rivited pipe, on the other hand, on account of the projecting rivet heads and the other irregularities of joints, has a greater frictional resistance. To obtain the same carrying capacity double-riveted pipe should be 4 per cent. greater in diameter than either the lock-bar or cast-iron pipe.

The circular joints of both double-riveted and lock-bar pipe are commonly made in this country by riveting. This makes what is known as continuous riveted pipe. With change in temperature the pipe tends to expand or contract, but is held by the earth and prevented from doing so, and the tendency is converted into stresses which tend to stretch or compress the steel, but which with good design never reach objectionable proportions. As these stresses are in all cases at right angles to those resulting from the pressure of water in the pipe their existing does not affect the strength of the pipe directly, although they may tend to bring out any weak points, and accumulating with other stresses they may have been factors in the production of such few breaks as have been noted with steel pipe.

These temperature stresses must be frankly recognized and provided for at every point. Overlooking them may mean disaster. The details of the joints and connections also must be very carefully studied and must be good.

The design of steel pipe has been standardized in the same way that cast-iron pipe has been standardized. More skill is required to reach a good and safe design with it. Fortunately the early lines of steel pipe were designed by able men and the precedents then established were good. It is for us to see that they are maintained, and that necessary precautions are not omitted.

Pipe 30 ins. in diameter can be successfully riveted in the field, although the space inside is rather small for good workmanship; 36-in. pipe is more easily riveted, and this marks the ordinary minimum limit of steel pipe as now made.

Cast Iron Costly in Larger Sizes

Generally speaking, with increasing size, cast-iron pipe increases in cost more rapidly than steel pipe. The saving to be made by using steel pipe as compared with cast-iron is relatively small for 36-in. pipe, and would probably disappear with 30-in. pipe under present conditions; it increases rapidly for 48-in. and larger pipe. This is true even with the methods of calculating the thickness of wall of cast-iron pipe that have been used in the past. When Prof. Talbot's work is taken into account, and the increased thickness logically called for is allowed on the larger sizes of cast-iron pipe, the difference will become greater.

There is a limit to the thickness of castings that can be advantageously used. A large pipe with very thick walls is probably relatively less strong and reliable than one with thinner walls because the internal stresses in the thick casting are greater and there is more likelihood of its going to pieces from its own internal stresses, acting either by themselves or in conjunction with other stresses from external sources.

When all these matters are taken into account large cast-iron pipe for considerable pressures will increase in cost as rapidly as the square of the diameter of the pipe. In other words, there will be relatively small saving by using very large lines of cast-iron pipe as compared with several lines of smaller diameter.

In our practice in the last years we have seldom considered the use of cast-iron pipe more than 36 ins., or at most 42 ins., in diameter. In nearly all cases we have felt that it was better business to use steel pipe where most capacity was required, or otherwise to divide the line.

Sometimes we have surrounded steel pipe with concrete, thereby adding to its stability and durability. The cost has been increased, but not so as to equal that of cast-iron pipe.

Causes of Cracking in Cement Pavements

In a paper presented at the annual meeting of the Michigan Engineering Society, Earle R. Whitmore, city engineer of Port Huron, Mich., discusses at length the causes of the cracking of cement grouted brick pavements and suggests remedies.

The causes observed by Mr. Whitmore are five in number, and are as follows: Frost, expansion, settling of the sand cushion, settling of the subgrade, and contraction between transverse expansion joints. These are arranged in what he regards as the order of their importance and frequency of occurrence.

Frost

According to Mr. Whitmore's observations, frost is generally, if not always, the cause of the longitudinal cracks appearing at or near the crown of the pavement. In support of this theory, he gives arguments essentially as follows:

Such cracks invariably make their first appearance when the snow goes off in the spring, and are then small.

Where the subgrade is clay, cracks occur in pavements provided with ample expansion joints along the curb, as well as in those without expansion joints.

Where the subgrade is sand, and on well drained fills, cracks are not found, even where no expansion joints are provided.

The cracks follow the line of travel where the snow is packed and the frost penetrates deepest. Where there are car tracks in a street and the subgrade is a material that retains water, there is usually a crack along the driveway on each side of the tracks. Where other streets cross the paved street, the cracks do not continue across the intersection, presumably because the travel across the street and around the corners packs the snow, so allowing the frost to penetrate over such a large area that the pavement is raised evenly and is not broken. Where, however, a street joins the paved street but does not cross it, the cracks run off toward the curb as they approach the side street, continue across it and come back to the centre beyond the side street.

If a careful examination be made of the concrete foundation under one of these longitudinal cracks, it will be found that the concrete is also cracked.

Mr. Whitmore then points out the failure of many otherwise excellent specifications to make proper provisions for drainage and so minimize the danger from frost.

To prevent cracking because of the action of frost, Mr. Whitmore recommends that when the subgrade is clay suitable drains be placed about 3 ft. below the tops of the curbs and the trenches filled with coarse material such as cinders or small field stone. These drains should then be connected with sewer inlets. He does not favor the use of cross drains. Mr. Whitmore states that he does not consider his observations sufficiently final to warrant the omission of expansion joints next to the curb since they are so generally specified, but states that it is his personal opinion that they are seldom of use except in very wide pavements. Once a crack is started, he says, it doubtless widens because of expansion and contraction, but he states that he has never seen a crack of this kind that appeared to have been caused originally by expansion.

Expansion

Damage to pavements by expansion, according to Mr. Whitmore, is comparatively slight and easily repaired, though sometimes spectacular when caused by the buckling of the pavement. Where there is no abrupt change of grade that allows the pavement to buckle, his observations indicate, he states, that the filler between the courses is sometimes crushed in places and the cracks make diamond shaped or triagular divisions on the surface, seldom breaking a brick but following the joints. If their is a bend or an angle in the street the effect of the expansion will be carried to that point and the angle will be crowded considerably out of line.

These zigzag cracks are inconspicuous as a rule, but according to Mr. Whitmore, tend to shorten the life of the pavement by allowing water to penetrate, and by forming starting points for the cracks caused by the jarring of heavy traffic. As a remedy, he recommends the providing of frequent transverse expansion joints formed by laying several courses about ¼ inch apart and filling the joints with a bituminous filler before grouting the rest of the pavement. Mr. Whitmore holds that a single expansion joint ½ inch or more in width is advisable because the passage of loaded vehicles causes a jar that soon loosens the adjacent bricks; because in warm weather the bituminous filler in a wide joint is apt to run from the crown toward curbs; and because the expansion sometimes forces together the bottoms of the blocks next the joints while the tops are still held apart by earth and other material forced into the joint, with the result that the bricks heave up next the joints.

Settling of the Sand Cushion

Cracks due to the settling of the sand cushion, according to Mr. Whitmore, result from several causes. Those enumerated by him are substantially as follows:

When spread on a macadam foundation the sand is apt to work down into the interstices in places, so causing unequal settlement and the cracking of the pavement. This could probably be avoided, he says, by filling and rolling the foundation in about the same manner as if it were to be finished macadam roadway, but such procedure would not usually be economical. He holds that except under unusual conditions, a good concrete foundation is the most economical in the long run.

If, in laying the concrete foundation, sufficient care is not exercised to make the surface parallel with the required pavement surface, the sand cushion will be of varying thickness and will be likely, therefore, to settle unevenly.

If the foundation be laid properly, but the cushion carefully luted, or laid with a templet and the templet not carried back and drawn over the surface several times, the surface will invariably be wavy and the cushion of unequal thicknesses. According to Mr. Whitmore, it is a serious mistake to leave the cushion uneven and depend upon the rolling to level it, for, though the roller will probably make it appear even, some of the blocks will be well bedded while others will receive practically no benefit from the rolling and will settle later under the traffic

If the sand be partly dry and partly moist when spread, the cushion will settle unevenly. A pile of sand is often moist on the outside and dry inside, or vice versa, and, according to Mr. Whitmore, when such sand is used it should either be dried or, perhaps, moistened uniformly.

Cracks caused by the settling of the sand cushion, according to Mr. Whitmore, usually divide the surface into approximately rectangular areas varying in size from two or three bricks to several square yards. The cracks do not extent across the bricks. The rectangles go down under traffic heavy enough to break the grout, or, if the traffic is not heavy enough to break the bond, an arch is formed, which gives rise to the rumbling noise so often noticed.

The proper thickness of the sand cushion, Mr. Whitmore states, has been the subject of much discussion. He believes that if it be properly laid, any thickness from one inch to two inches is suitable. He also holds that a sand cushion properly and carefully constructed is as good as a mortar bed, and perhaps better.

Settling of the Subgrade

The settling of the subgrade, like that of the sand cushion, Mr. Whitmore attributes to several causes. Pavements laid across fills are apt to settle, and very wet and undrained subgrades are likely to produce the same result. Only great care, he states, will prevent the first, and suitable side drains will usually remedy the second trouble. Another cause cited is the improper filling of trenches opened for various purposes. Too great care, he says, can not be exercised in backfilling such trenches.

Contraction Between Transverse Expansion Joints

The contraction between transverse expansion joints, according to Mr. Whitmore, results in the formation of fine cracks that are hardly noticeable unless outlined by moisture. When the expansion joints are placed at considerable distances apart, these cracks appear at intervals, he states, and follow the grouted joints from curb to curb. Where the expansion joints are 50 ft. apart two of these cracks appear in each 50-ft. section, dividing it into length of about one rod. He believes that chacking from this cause can be avoiled by placing transverse expansion joints at intervals of about 15 ft., in which case it would be necessary to fill only one or two joints at each place with bituminous filler.

Canadian Railroad Development

Locating engineers of the Grand Trunk Pacific are reported to be working on a branch line from the new transcontinental route in Alberta up into the Peace River country.

The Canadian Pacific Railway has issued and sold in London $6,161,000 additional consolidated 4 per cent. debentures stock. The proceeds are to be used for the construction of 553 miles of branch lines in Manitoba, Saskatchewan and Alberta.

H. M. E. Evans, Edmonton, Alto., acting on behalf of a syndicate of British capitalists, has applied to the city council of Saskatoon, Sask., for power rights on the Saskatchewan River at this point, and also for a 20-year franchise for a street railway. The syndicate proposes to expend $2,000,000. The scheme includes the taking over of the charter of the Saskatchewan Power Company, a local corporation, which obtained a franchise to dam the river 12 miles north from the Dominion government three years ago.

The Saskatchewan government has approved a change in the route of the Grand Trunk Pacific between Moose Jaw and Regina. The present status of work on this line in Saskatchewan is as follows: Grading on the line from Qu'Appelle to Regina will be completed by the first week in July. Steel laying will be completed three weeks later. The grading gang when it reaches Regina will start immediately on the G. T. P. line from Regina to the border. A grading gang has reached Edenwold, 24 miles from Regina. Grading on the Moose Jaw-Regina G. T. P. line is going ahead rapidly.

The Bruce Mines & Algoma Railway Company, now operating between Bruce Mines and Rock Lake, Ont., has been purchased by George P. McCallum and H. Appleton, Sault Ste. Marie, Mich., and plans are under consideration for extending the line to a connection with the Grand Trunk Pacific, a distance of 350 miles. It is reported that the Fidelity Trust Company, Montreal, Que., will act as financial agents of the reorganized road and will underwrite a bond issue amounting to $6,000,000. The road as extended will intersect the Soo branch of the Canadian Pacific, the main line of the same road at Ridout, and the Canadian Northern. now under construction, and connect with the Grand Trunk Pacific one hundred miles west of Cochrane. After the road crosses the Canadian Pacific main line it enters the great clay belt, which will thus be opened up to settlement and cultivation. A branch will run into the Porcupine district. It is expected all of the preliminary work will be done so that the work of actual construction may be started on August 1.

A Montreal Inspection Company

The Dominion & European Inspection Company, of Montreal, has been reorganized quite recently and its offices are now located at 318 Lagauchetiere street west,—in charge of Mr. Bertram W. Seton (general manager), and Mr. John Hammersley-Heenan, A. M. Can. Soc. C. E. Hitherto the company's operations have been carried on principally in Great Britain and the continent of Europe under the firm name of "E. G. Carey," Inspecting and Consulting Engineers: head office, Uddingston, Glasgow, Scotland. The firm has had extended experience in all branches of engineering work, including bridges, steel buildings, steel wharves and jetties, pontoons, docks, dredges, floating rock cutters, railway plant of all kinds, including rails and accessories and cars of various classes, waterworks machinery and plant, steel and cast iron pipes, etc.

Of the scores of large contracts carried out by the firm it may be sufficient to mention the inspection of the Forth bridge, the largest cantilever structure in the world, which was entrusted to Mr. E. G. Carey. The company have an efficient staff and are open to undertake similar inspections in Canada. Associated with the firm are analytical chemists for cement testing, etc., and consulting engineers who have made a special study of building and other foundations, the best methods of sinking, where difficult conditions obtain, and the most satisfactory construction in all branches. Also, they have the most improved instruments for measuring and recording vibrations in buildings, etc. They are prepared to make accurate reports and advise as to changes when necessary.

The National Fireproofing Company's publication, "Building Progress," is one of the brightest publications of the kind we know. It is issued every month and each number contains several up-to-date articles dealing with practical phases of construction. "Building Progress" should appeal alike to the architect, builder and owner. Copies may be obtained from the Toronto office of the National Fireproofing Company in the Traders Bank Building.

Personal News and Notes

The estimated cost of the proposed new G. T. P. dock at Prince Rupert is $2,500,000. Plans for the structure have been finally approved by the company's officials.

Mr. T. Aird Murray, consulting engineer, Toronto, has submitted his report on the Melfort, Sask., water supply. Mr. Murray was in Melfort for several days last week.

The building permits issued at Moose Jaw, Sask., last month totalled $298,950, compared with $207,000 for May, 1910, and $61,500 for May, 1908. The total for 1911 to date is approximately $750,000.

The building trade at Welland, Ont., reports operations seriously delayed by a scarcity of brick. Not only local brick but pressed brick from outside points is very hard to obtain.

Mr. C. M. Drewitt, 678 Spadina avenue, Toronto, was awarded first place in the competition recently conducted by the Model Homes' Association of Ottawa. Messrs. H. Carter and H. C. Beckett, Toronto, were next in order of merit.

The Alberta Pressed Brick Company, Calgary, Alta., has purchased a site for the erection of a plant. J. W. Farner, engineer of the company, states that the capacity of the plant will be 40,000 brick a day. Provision will be made for large extensions at an early date.

The new city engineer of Lethbridge, Alta., is Mr. H. F. Merryweather, who has been appointed at a salary of $5,000 a year. For the last 30 years Mr. Merryweather has been city engineer of Denver, Colorado, during which period that city has increased in population from 50,000 to over 200,000.

City Engineer Fellowes, of Vancouver, has submitted plans for four bridges over the C. N. R. tracks in the east end of the city at Hastings, Pender, Harris and Keefer streets. The longest bridge, 1,200 feet, is at Hastings street, and the shortest, 777 feet, at Pender street. The total cost to the city will be from $244,000 to $434,000, according to the type selected. The designs were issued from the office of Messrs. Waddell & Harrington, of Kansas City.

Messrs. J. G. Hargrave & Co., Winnipeg, have been awarded the contract for a new line of railway in the west. The new road will leave the main line of the Canadian Pacific between Medicine Hat and Calgary, near the station at Bassano, and will run through a district into which large numbers of settlers have gone this year. It will be forty miles in length and will connect with the recently constructed line which runs north from Langdon on the main line and then east to Standard.

One of the graduates of the engineering department of the University of Michigan this year was Lillian Pearl McOmber. Lillian P. has the distinction of being the first of either sex to obtain the degree of Bachelor of Science in Agricultural Engineering. According to a recent dispatch from Ann Arbor, Miss McOmber "is of average height, blonde, with a matchless complexion and great violet eyes." She has specialized in steel structural work and it is said to be her intention to enter a New York city office. We wish her every success.

Mr Alexander Milne, the newly elected president of the American Waterworks Association has for the past ten years occupied the position of engineer and superintendent of the waterworks department at St. Catharines, Ont. He was born at Aberdeen, Scotland, in 1860 and came to Canada with his parents in 1875. After coming to Canada, Mr. Milne took a 4-year apprentice course, after which he served for a number of years on railway construction in the engineering organizations of several companies. He has been in municipal engineering for the past 24 years. At St. Catharines Mr. Milne has deservedly earned much credit for developing the waterworks system to its present state of efficiency. He has often been asked to take charge of large waterworks systems in the United States, but has always declined in favor of remaining at his home in the Garden City. Mr. Milne has held many important offices in the organization of the American Water Works Association. In 1904 he was a member of the Finance Committee, and has subsequently held in turn each of the five vice-presidencies. He was elected president for the coming year at the recent convention of the association held in Rochester, N. Y. He is also a member of the Canadian Society of Civil Engineers.

Canadian City Engineers

A. Benzie, St. Catharines, Ont.

Mr. D. Benzie, who has been city engineer of St. Catharines, Ont., for the last five years, is a native of Scotland, having been born at Carnoustie in Forfarshire 32 years ago. He received his early education at the Dundee High School and later graduated in civil engineering from Dundee College (St. Andrew's University). Mr. Benzie entered upon his professional career as a member of the staff of Mr. R. Blackadder, Dundee, and Messrs. J. & A. Leslie & Reid, of Edinburgh, with whom he gained considerable experience in road and street construction, sewerage and waterworks. Afterwards he became engaged with the Caledonian Railway Company (Northern division, Perth), having charge of the laying out of several railway extensions and the renewal of steel bridges and stations. In 1903 he was appointed resident engineer on the main drainage system of Aberdeen, a contract involving the expenditure of over one million dollars. Later, he was appointed chief engineer of the Aberdeen "City Improvement Department." In spite of his advancement in Scottish municipal service, however, and of his inherent love for the land of the heather, Mr. Benzie turned

City Engineer Benzie, of St. Catharines, Ont.

his attention to the Canadian field and came west in June, 1906. Arriving at Toronto he quickly obtained an appointment as assistant engineer in the city roadways department. In [illegible] 1906 Mr. Benzie was appointed city engineer of St. Catharines.

Since his arrival at St. Catharines, Mr. Benzie has succeeded, after much effort, in revolutionizing the old sewerage system. During his tenure of office many of the business and residential streets have been paved with asphalt block, brick and bitulithic. Also, under Mr. Benzie's supervision a number of granolithic sidewalks and fine boulevards have been laid, these contributing materially to the appearance of the city.

Mr. Benzie is an associate member of the Canadian Society of Civil Engineers and a member of the Aberdeen Association of Civil Engineers.

The engineering reputation of the Garden City is quite safe in the hands of City Engineer Benzie and St. Catharines is to be congratulated upon having secured the services of an engineer with such eminent qualifications for municipal work.

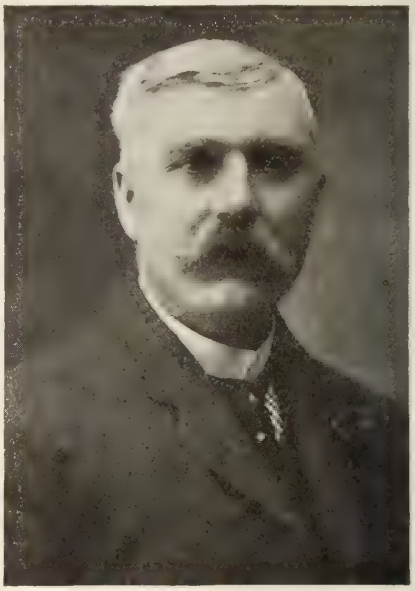
Master Builders of Windsor, Ont.

The Builders' and Contractors' Association of Essex was organized on April 10, 1908. Its headquarters are located in the Thompson Building at Windsor, Ont. Membership in the association is limited strictly to contractors in some branch of the building trade. Supply men are not eligible. In this respect the association differs from the builders' exchange throughout the country. The Windsor body is comprised of 40 members or firms. The officers for the present year are: President, U. F. Dumouchelle; vice-president, T. W. Brook; secretary, G. W. Freeman. The meetings of the association are held on the first and third Tuesdays of each month.

Mr. D. F. Dumouchelle, President

The efforts of the association are directed toward the encouragement and protection of the building and contracting interests; the establishment and maintenance of uniformity in trade, building and commercial usuages; the strongest objection to identifying itself with any foreign body. Anything of an international character it holds inculcation of just and equitable principles in regard to disputes.

The association has not affiliated with the C.N.A.B. for the reason that it prides itself upon being a separate and distinct body of master builders. And it entertains the as a proposition of doubtful benefit. From what we learn we believe that the association might be induced a little later on to become affiliated with a national body, but only if such an institution were organized solely from the ranks of strictly master builders.



Mr. G. W. Freeman, Secretary

During the summer the association arranges enjoyable little outings for its members on the Saturday half holidays, which commenced this year on the 17th inst., and will continue until Sept. 16th. The opening event of the kind was held at the Island View Hotel, opposite Belle Isle, Detroit Park, and on the river bank above Walkerville, Ont. Sides were chosen for quoits and the victims paid for the winners' suppers as well as their own. Those present as guests upon this occasion were the secretary of the Detroit Builders' and Traders' Exchange and the sectary of the Detroit Employers' Association.

Among the important contracts for steel framing secured this season by J. Coughlan & Sons, Vancouver, may be mentioned the World building, 20 storeys; Dawson building, 8 storeys; H. O. Lee building, 7 storeys; Metropolitan building, 10 storeys; Holden building, 10 storeys; F. D.Boucher building, 10 storeys. The past month witnessed the completion of the Metropolitan and Holden buildings;the commencement of the erection of the Dawson building and the finishing touches on the World building. Steel for the Lee and Boucher buildings is now being fabricated. When completed, the World building will be the highest steel frame structure under the British flag. All the details of design and execution are the product of Messrs. Coughlan & Sons' shops, Vancouver. The firm informs us, by the way, that there is always employment for good structural shop hands.

E. F. Dartnell, Montreal, has recently booked the following order for the Shawinigan Water & Power Company's new power house at Shawinigan Falls: about 60,000 enamelled brick, 130,000 buff Kittanning vitrified brick, and 25,000 "tapestry" brick.

E. F. Dartnell, Montreal, is supplying 21,000 "tapestry" brick for a dwelling on Pine avenue. Nobbs & Hyde, architects; H. C. Hitch & Company, contractors.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brandon, Man.

Plans and estimates being prepared for sewer. Owner, City of Brandon, Man.; city engineer, R. E. Speakman; city engineer instructed to prepare plans and estimates at once for deepening and enlarging sewers on Rosser avenue. Supplementary report later.

Projected work, waterworks, $100,000. Owner, City of Brandon, Man. Engineer, R. E. Speakman, Brandon. Sedimentation basins. Engineer now preparing report and estimate. Owing to low temperature in winter, basins will be protected against frost thus accounting for high estimate of cost.

Tenders called for machinery for waterworks. Owner, City of Brandon, Man. Engineer, R. E. Speakman, Brandon; electrification of present steam plant; two 2,000,000 gallon variable speed pumps, also a Diesel Oil Engine. Pumps to be suitable for electrical operation. Tenders to be called at once, received by R. E. Speakman until about July 4th.

Edmonds, B. C.

Tenders called for valves (water supply) No. 2. Owners, Corporations of Edmonds; W. Griffiths, clerk. Engineer, Cleveland & Cameron, 506 Winch Bldg., Vancouver, B. C. Supply of about 138 sluice and special valves, varying in size from 3 to 24 in. Particulars at office of engineers. Tenders received until July 24th, by clerk.

Goderich, Ont.

Equipment wanted for sprinkling system. Owner, Kensington Furniture Co. Goderich; F. W. Rumball, Lon. Owner, Goderich Organ Co., A. Sanders, manager, Goderich. These two firms are contemplating the installation of sprinkler systems in their factories now being re-built after partial destruction by fire. Machinery portion not damaged in either case.

Hamilton, Ont.

Equipment required for road building, $3,000 (Easholme Survey, E. Hamilton). Owner, J. W. Gage, Chancery Chambers, Hamilton; city engineer, A. F. Macallum, Hamilton. Required graders, granolithic sidewalk, drain covers. Tenders will be called in about six weeks. Information obtained from J. W. Gage, Hamilton.

Work in progress for trunk sewer, $110,000. Owner, City of Hamilton. City engineer, A. F. Macallum. Reinforced concrete, 2,286 ft. long, 78in. diameter. Work just begun by Hamilton board of works.

Lachute, Que.

Tenders called for waterworks. Owner, Corporation of Lachute, Que. Secretary-treasurer, James W. Raitt, Lachute Town. Engineer, W. Kennedy, C. E., Montreal. Excavating, laying and refilling of about 17,200 ft. of 8 in. c.i. water pipes. Specifications prepared by W. Kennedy, obtained from secretary-treasurer. Tenders received until noon June 28th, by secretary-treas. Advertisement in "Tenders and For Sale Department" of this issue.

Nanaimo, B. C.

By-law to be submitted for sewer extensions. Owner, Corporation of Nanaimo; city engineer, A. G. Waters, Nanaimo. By-law to be submitted on June 29th. F. G. Pete, returning officer. The electric power by-law will also be submitted.

New Westminster, B. C. (West End).

Owner, City Council. Engineer, J. W. B. Blackman, C. E., New Westminster; earthern pipe, size, 6 in. to 14 in., length 8 miles. Tenders called probably in June.

New Westminster, B. C. (Sapperton).

Owners, New Westminster City Council. Engineer, J. W. B. Blackman; city offices, New Westminster. Earthern pipe sewers, size 6 in. up, length about 10 miles. Work will probably commence next year.

Ottawa, Ont.

Tenders called for road making. Owners, City of Ottawa, Ont. (Carling avenue and Queen street). Engineer, N. J. Kerr, City Hall, Ottawa, Ont. Six inch concrete, two inch asphalt, 5,650 also 3,810 sq. ft. concrete, 12-inch gutter, 85 sq. ft. sidewalk replaced, 93 lin. ft. stone headers. Tenders received until June 27th,- 1911.

Prince Rupert, B. C.

Proceedings of council; waterworks & power plant. Owners, City of Prince Rupert, B. C. City Engineer, W. M. Davis; consulting engineer, R. H. Thomsom, Seattle, Wash. Report of W.M. Davis endorsed by R. H. Thomson, with the exception of the substitution of 18 in. pipe for 24 in. Proposed hydro-electric plant to develop power for lighting purposes for city, about 835 h.p Council decided to prepare necessary by-law for expenditure.

Quebec, Que.

Council proceedings, paving. Owners, Corporation of Quebec. City engineer, W. D. Baillairge, Quebec. Asphalt work. The contract awarded to Messrs. Falardeau & Cie on May 31st has been cancelled by council and authority given to call for new tenders. Ebano and Bermuda asphalt favored by council.

St. Thomas, Ont.

Tenders called for waterworks. Owners, City of St. Thomas. Engineer, Mason H. Baker, City Hall, St. Thomas. New work reinforced concrete, coagulating basins, cost not estimated yet. [illegible] Plans, etc. at City Engineer's office. Tenders received until June 24th by G. & R. Crocker, chairman Water Bd., City Hall, St. Thomas.

St. Catharines, Ont.

Tenders called for waterworks. Owner, Corporation of St. Catharines, Ont. Supt. of Waterworks, A. Milne, St. Catharines. Sec. A. 4,200 lin. ft. rock tunnel 5 ft. x 8 ft.; B., excavation and pipe laying, 5,000 ft.=24 in. and 30 in. c.i. pipe; 36 in. c.i. intake pipe; concrete intake and valve chambers. Building auxiliary reservoir. Sec. C., excavation and pipe laying 15,000 ft. 24 in. c.i. pipe. Specifications, etc., at office of Waterworks Commission, City Building. See advertisements in "Tenders and For Sale Department" of this issue.

Sydney, N. S.

Tenders called for paving. Owners, City of Sydney. N. S. (Charlotte street) City clerk, Jas. S. Curry, Sydney. Plans, etc., may be seen at the office of the Contract Record, 220 King street west, Toronto, and also obtained from the City Engineer, D. McD Campbell, Sydney. Tenders received until July 4th, by clerk until 5 p.m.

Toronto, Ont.

Extension of time (tenders) for waterworks. Owners, City of Toronto, Ont. Chairman, Board of Control, F. S. Spence, Toronto. Between 3,000 and 3,500 ft. of rivetted steel pipe, 6 ft. in diameter. Specifications at office of City Engineer C. H. Rust. Tenders received until July 3rd by chairman board of control.

Whitby, Ont.

Tenders to be called for cement sidewalk. Owners, Corporation of Whitby, Ont. Town clerk, Joseph White, Whitby. Tenders to be called next week for about 40,000 ft. Specifications at office of town clerk.

Westmount, Que.

By-law carried for road and sewers, $500,000. Owner, City of Westmount; City Engineer, A. Currie. The loan has been authorized and work will be done under direction of city engineer.

CONTRACTS AWARDED

Edmonton, Alta.

High pressure turbine, $47,500. Owners, City of Edmonton, Alta. Engineer, J. C. Hefferman, Edmonton. 2,000 kw. high pressure turbine. Successful contractor, Canadian Westinghouse Co., head Canadian Branch, Hamilton, Ont. The Allis Chalmers Bullock of Milwaukee refused the contract, which has since been awarded as above. Apparatus required Nov. 30, 1911.

Halifax, N.S.

Waterworks. Owner, City of Halifax, N.S.; engineer, F. W. W. Doane, City Hall; contractor, W. S. Craig, 316 Upper Water street, Halifax. Installa- [illegible] wiped joint. Contract was awarded on June 4th to John McFatrige at 60c., which has been withdrawn.

Work has commenced on the sewerage contract in Lancaster which is to cost $50,000. Contractors (North street district), Pollock & Corey; (septic tank) John A. Wheaton & Son, James E. Kane & Co.

New Westminster, B. C.

Paving. Engineer, J. W. B. Black[illegible] A.M.C. Inst. C.E., New Westminster. Successful contractor, T. R. Nickson, Vancouver, 162 Western Vancouver, at $33,500, granite setts. Other contractors, Larson & Petterson, $37,787 and La Placa Bros., $39,805, both of Vancouver. Powers Contracting Co. $43,493, Hassam Paving Co. $47,431, and H. N. Smith $63,863, all of New Westminster. Awaits approval of property owners. Bids opened June 12th.

Railroads, Bridges and Wharves

Aldermere, B. C.

Tenders reported for railroad. Owner, Grand Trunk Pacific Ry., President, C. M. Hays, Montreal. General manager, E. J. Chamberlain, Montreal; Chief Engineer, B. B. Kellither, Montreal, Qne. Tenders will be called shortly for con struction of 410 mile gap between Aldermere and Tete Jaune Cache.

Brandon, Man.

By-law carried for purchase of street rails, etc. Parties interested, City of Brandon, Brandon Gas Co. and street railway. Votes taken in favor of extension of franchise of the Brandon Gas Co. and authorization of debenture issue for $25,000 for purchase of rails for street railway. Voted June 15th.

Plans changed for railway construction. Owner, Brandon, Can. Pacific Ry., Can. Northern and Great Northern roads. 1½miles, survey made. Transfer line to connect all 3 railroads. Route reported in former announcement changed by Railway Commissioners.

Chilcoten, B. C.

Tenders called for suspension bridge, (Cariboo District). Owner, Public Works Department, Victoria, B. C. Pub. Works engineer, J. E. Griffiths, Victoria, B. C. Required—Metal and bolts, delivery at Ashcroft by Sept. 15. Specifications at Department, at office of E. McBride, Rd. Supt., Vancouver, or Government agent, New Westminster. Tenders received by Public Works Engineer until June 30th.

Churn Creek, B. C.

Tenders called for bridge (suspension, over Fraser River). Owner, Public Works Depart., Victoria, B. C. Public Works engineer, J. E. Griffiths, Victoria. Cables and accessories and metal required, delivery at Ashcroft, B. C., on or before Oct. 31st. Specifications at the offices of the engineer, Victoria, B. C., and E. McBride, Road Supt., Vancouver. Tenders received by P. W. Engineer until July 10th.

Chatham, Ont.

Christianson Motor Co., of Milwaukee, plan to merge with the Swift Motor Works, enlarge the plant, instal new machinery, etc.

Edmonton, Alta.

Plans being prepared for subway. (Jasper street). Owner, City of Edmonton, Alta. Engineer, A. J. Latournell, Edmonton. Construction concrete. The Can. Pac. Ry. Co. are preparing plans and will call for tenders at a later date.

Hamilton, Ont.

Plans being prepared for bridge, $30,000. (Birch avenue). Owner, Toronto, Hamilton & Buffalo, Ry., Hamilton. Engineer, Lathem and City Engineer, Hamilton. One span, 66 ft. width 25 ft. Bridge ordered to be built, city to build abutments, railway superstructure of steel. Work suspended, dispute over land. Supplementary report later.

Contemplated electric railroad. (Hamilton to Galt). Owner, Dom. Power & Transmission Co., Hamilton, Ont. Partial surveys have been made. Dom. Power & Transmission Co. announce they will build if Hamilton does not pass municipal power by-law to be voted on in August.

Montreal, Que.

H. Forget, 1956 Dufferin street, has plans completed for erection of building of twelve flats, 100 x 40, on Christopher Columbus street. Cost, $12,000.

Montreal Locomotive Works, Ltd., Ottawa Bank Building, have had plans prepared by American Locomotive Co. for factory at Longue Point. Cost, $34,000. Percy Webb, manager.

Port Stanley, Ont.

Department of Public Works have forwarded completed plans for construction of breakwater. Estimated cost $60,000. Work to be completed this summer. A new pier is also planned.

Sydney, N. S.

Contemplated bridge, $7,000. (Whitney avenue). City Engineer, D. McD. Campbell. Steel construction, 200 ft. length, 26 ft. width. Owner, Corporation of Sydney, N. S.

St. John, N.B.

D. Alexander & Son, Compbellton, has had plans prepared by F. Neil Brodie, St. John, for a 2-storey brick store, 25 x 90 feet; day labor.

The Gordon Nail Works have decided to move to Calgary, being unable to make satisfactory arrangements with the city for the lease on which their property is situated.

Tenders closed yesterday at noon for the purchase of the plant, machinery, and building of the A. E. Hamilton, Ltd. No bids came to hand and the property may be disposed of otherwise.

Toronto, Ont.

Contemplated bridge (across the Don, near Russell Hill). Owner, County of York. Engineers, Barber & Young, Adelaide street, Toronto; concrete bridge, 60 ft. arch. Plans and specifications to be prepared within a week or so.

Tenders called for subway. (Jane St. West, Toronto). Owners, Can. Pacific Railway—Ontario Division. Div. Engineer, A. L. Hertzberg. Construction of concrete abutments required in connection with Jane street subway. Plans, etc. at office of Res. Eng., Fullington, Room 605 Union Station, Toronto Tenders received until June 30th by Div. Engineer.

Township of Amaranth, Ont.

Tenders called for bridge. Owners, County of Dufferin; engineer, F. Barber, 57 Adelaide street east, Toronto; construction of concrete abutments for steel bridges; Miller's Creek Bridges, Lot 26, Con. 10; McConachie's Bridge, Lot 6, Con. 9. Plans, etc., at office of the engineer. Tenders received until noon, June 30, by F. Barber.

Vernon, B.C.

Tenders called for station. Owner, Canadian Pacific Railway; Div. Engineer, H. Rindall, Vancouver. Plans, etc., at office of H. Rindall, or resident engineer, Revelstoke, or station agent, Vernon.

Vancouver, B.C.

It is reported that the R. V. Winch Co. Winch Bldg., are considering large additions to wharves and sheds along the C. P. R. stock sheds.

The Hudson Bay Co. have purchased a site on Douglas, Harold and Fisguard streets, in Victoria, for about $225,000, and intend building a large department store.

Windsor, Ont.

Plans being prepared for public dock. (Foot of Church street). Owners, Dominion Government, Ottawa. Engineer, Major Charles Lamb, government engineer, London, Ont. Dock to be of concrete. Government has granted $30,000 for the work this year. Further grants expected next year. When completed with warehouse, it is estimated the entire work may cost $100,000.

CONTRACTS AWARDED

Thetford Mines, Que.

Freight shed, $5,500. Owner, Quebec Central Railway, Sherbrooke, Que; architect, L. N. Audet, Sherbrooke, Que.; general contractor, Mr. Goff, Thetford Mines. Contract let June 20th, building to be completed September 1st.

Public Buildings, Churches, Schools, etc.

Amherstburg, Ont.

Specifications in progress for Carnegie library, $10,000. Ownes, Public Library Board, Amherstburg. Secretary, S. McGee, Amherstburg, Ont. Architect, R. W. Crane, Windsor, Ont. Material, stone and pressed brick (stone has been bought by the board). Roof, galvanized tin.

Brandon, Man.

Tenders called for system of lavatories, $8,500 (Exhibition Grounds), Owner, Western Agricultural Association, Brandon. Architects, W. A. Elliott, Brandon. Two frame buildings, each containing 24 closets; c.i. white enamelled troughs called for, plumbing and connections with sewer. Tenders called June 21.

Tenders called for Exhibition buildings, $4,000. Owners, Western Agricultural Association, Brandon; architect, W. A. Elliot, Brandon. One storey, 100 x 30, frame, pitch roof. Tenders received until June 24th.

Barrie, Ont.

Tenders called for school addition, $40,000. Owner, Board of Education, Barrie. Architects, Stewart & Witton, Hamilton. 2-storey and gymnasium, brick and steel, stone foundation, steam heating, electric lighting, tar and gravel roof, interior finish Georgia pine, cement work, cut stone, brick, tile, fireprofing, reinforced concrete, metallic lath, structural iron, ornamental iron, weather strips, fireproof doors, pipe covering, electrical work, electric bells, roofing, sheathing or deafening paper, steel beams, plate glass. Time for calling for tenders not decided yet.

Campbellton, N.B.
Tenders called for theatre, $8,000. Owner, H. A. Marcus, Campbellton, N.B.; architect, R. A. Frechette, Moncton, N.B. One storey, 45 x 96 feet, brick, steam heating, electric light, pine finish (interior), cement work, fireproofing, reinforced concrete, fire escapes, freight elevator, sidewalk lift sheet metal work, metal ceiling, cornice, plate glass, plastic relief work. Tenders received after July 3rd.

Danvers, Man.
Tenders called for school. Owners, Public School Board. Sec.-Treas., R. Hjelmeland, Danvers, Man. Plans, etc. on application to W. Mann, Minnedosa, and Harrison's lumber yard, Neepawa, or R. Hjelmeland, Sec. 15, 18 W. Tenders received by the sec.-treas. until July 5th.

Edmonton, Alta.
Tenders called for passenger elevator, $15,000. (Parliament Building.) Owner, Provincial Government, Edmonton. Architect, A. M. Jeffries, Edmonton. 4 passenger elevators. Tenders received until June 30th by Deputy Minister of Public Works.

Fort William, Ont.
Tenders to be called for hall, $50,000. Victoria avenue. Owner, Oddfellows Order, Fort William. Architect, Hood & Scott, Fort William. Two storeys, 66 x 100, brick and stone, concrete foundation, tar, gravel and iron roofing, cement work, cut stone, structural iron, steel beams, iron columns. Tenders will be called for in the near future.

Guelph, Ont.
Plans being prepared for Y. M. C. A. building, $50,000. Tenders received after July 30, approx., close in about a week. Architect, Mills & Hutton, Hamilton, 4 storeys, 96 x 53, stone foundation, brick and steel, steam heating, electric light, felt and gravel roof, interior finish oak, cement work, cut stone, marble terra cotta, tile, mantels, fireproofing, metallic lath, structural iron, fire escapes, cornice or skylights, weather strips, pipe covering, electrical work, electric bells, roofing, sheathing or deafening paper, steel beams, iron columns, ornamental columns or caps, plastic relief work plate glass, prismatic glass.

Haileybury, Ont.
Tenders called for church furnishings. Owner, Roman Catholic Cathedral. Architect, E. Payette, 15 St. James St., Montreal. Pews are required just now. Other furnishing later. Tenders received by architect until June 22.

Kara, Ont.
Tenders called for public school. Owner, Public School Board, Karo. Architect, J. A. Ewart, Ottawa. 2 storey 40 x 50, [illegible] concrete foundation, metal roofing. Tenders received until June 27th by C. G. Lindsay, Karo, Ont.

Megantic, Que.
New tenders called for church. Owner, Roman Catholic Church, Lake Megantic; architect, L. N. Audet, Sherbrooke, Que., and J. A. Godin, 229 St. Denis street, Montreal, Que. Stone foundation, cut stone, brick and terra cotta, electric light, art glass. Tenders were called before; none accepted. Tenders received until July 1. New plans.

Moncton, N.B.
Tenders called for fire station, $14,000. Owners, City of Moncton; architect, R. A. Frechette, Moncton. Two storeys, 40 x 60, brick and concrete, stone foundation, steam heating, electric light, enamel iron plumbing, ruberoid roofing, spruce interior finish, cut stone, fireproofing, reinforced concrete, metallic lath, structural iron, ornamental iron, metal ceiling, sheet metal work, electric bells, steel beams, telephone system. Tenders received until June 30th.

Nelson, B.C.
The Board of Education are contemplating the establishment of a mining school, cost $20,000. Hon. H. E. Young, Minister of Education.

Niagara Falls, Ont.
Tenders called for school. (Barker street). Owner, Public School Board. Secretary, Geo. Mortimer, Niagara Falls, Ont. Alterations and addition. Revised plans, etc. at office of the secretary. Tenders received by G. Mortimer until 6 p.m., July 3rd.

Newmarket, Ont.
Tenders to be called for public building, $5,000. (addition to Industrial Home). Owner, County of York, Toronto street, Toronto. Architect, O. E. Tench, Newmarket. 2-storey, brick, steam heating, slate roofing. Plans have been prepared. Tenders will be called shortly.

North Vancouver, B. C. (Ridgeway Avenue).
Tenders to be called for school. Owner, Public School Board. Architect, Claude P. Jones, Pender street, Vancouver. Tenders will be called shortly.

Ottawa, Ont.
Tenders called for church. Owner, Congregational church, Ottawa. Architect, A. A. Leb Week, Can. Life Bldg., Ottawa. 96 x 60 farme and brick, stone foundation, hot water heating, electric light, shingle roof, cement work, artificial stone, electrical work, steel beams, art glass, leaded glass. Tenders close June 27th.

Prince Albert, Sask.
Tenders to be called for receiving station, $12,000. Owner, City of Prince Albert, Sask. Consulting engineers, C. H. & P. H. Mitchell, Traders Bank, Toronto. Construction of building, brick and concrete; supply of two large 3-phase transformers, switchboards, etc. Tenders received in about a week by C. O. Davidson, Prince Albert, Sask.

Renfrew, Ont.
Tenders extender for addition to collegiate. Owner, Renfrew School Board. Sec.-treas., Geo. Eady, Jr., Renfrew. Architect, J. D. McNicol, Renfrew. The addition to be used as a gymnasium Plans, etc. with J. D. McNicol. Tenders received until June 23 by Geo. Eady.

Saltcoats, Sask.
Tenders called for town hall. Owner, Corporation of Saltcoats; sec.-treas., C. E. Boake, Saltcoats. Architects, Storey & Van Egmond, Regina and Saskatoon. Brick veneer. Plans, etc. at office of sec.-treas., and at office of architects. Tenders received until July 4th by C. E. Boake.

Shawinigan Falls, Que.
Tenders called for post office, $45,000. Owner, Federal Government, Pub. Works Dept., Ottawa, R. C. Desrochers, secretary. Architects, Asselin & Anger, 17 Place d'Armes, Montreal, Que. Stone and brick foundation, hot water heating, electric light. Plans, etc. at the office of architects, at the office of the same firm, Three Rivers, Qne., and at the Department. Tenders received by secretary until July 5th, 4 p.m.

Saskatoon, Sask.
David Webster has plans prepared for a new 12-room school, also an apartment house. Cost $35,000; stone and pressed brick.

Tenders to be called for hospital, $150,000. Owner, Roman Catholic Church; architect, E. & W. S. Maxwell, 6 Beaver Hall Square, Montreal; brick and concrete. Tenders will be called in about two weeks' time.

St. John, N.B.
President Twitchell, of the Twitchell Lumber Company, of New Hampshire, is believed to have completed negotiations for the purchase of the Scott Lumber Company's lands in this province and the Victoria Mills in Fredericton. The Twitchell Co. have had an option for some time.

St. Andrews, N.B.
The Board of Education will appoint a committee re the erection of a new school. Dr. Carter, chief superintendent of education.

Toronto, Ont.
Tenders called for addition to schools, $100,000. Owner, Board of Education, Toronto; secretary, W. C. Wilkinson, City Hall, Toronto; enlargement of Essex street and Manning avenue schools; steam heating and plumbing, cabinet work, mid-summer repairs, tinsmith, stove and furnace work, iron stairs, iron fences, hydraulic hoists, lawn mowers, hose and hardware, linseed oil, turpentine, white lead, floor oil and lubricating oils. Specifications at office of Superintendent of Buildings, City Hall. Tenders received until noon June 30.

Tenders to be called for alterations to Parish House, $10,000. Owner, Wardens of Holy Trinity Church, Toronto. Architects, Darling & Pearson, Leader Lane, Toronto; addition 50 x 25, brick and stone, hot air heating, electric lighting, slate roof, sheet metal work, electrical work. Tenders called in about two weeks.

Tenders called for Parish House, $15,000. (West Toronto). Owner, Wardens of St. John's Church; architects, Symons & Rae, 15 Toronto street, Toronto, Ont. [illegible] and stone, stone foundation, electric lighting, felt and gravel and slate roofing, structural iron, fire escapes, steel [illegible] Heating not decided. Tenders received until June 23rd, by the architects.

Plans being prepared for church, $30,000. (Deleware avenue). Owners, Wardens of St. Mary's Church, Bloor and Deleware. Architect, W. A. Langton, 88 King street E., Toronto. 2-storey, brick and stone, stone foundation, electric lighting. Tenders will not be called before Sept. 1st.

Tilsonburg, Ont.
Authorized by council, re-building school. Owner, Public School Board, Tilsonburg. School solicitor, V. A. Sinclair, Tilsonburg. The by-law to raise $25,000 for rebuilding of school was passed by the council.

Vancouver, B. C.
By-laws carried for buildings (Municipal), $80,000. Owner, City of Vancouver. City Clerk, W. McQueen. Construction of jails, etc., $40,000; isolation hospital, Hast. $50,000.

Site purchased for synagogue. Owner, Temple Emmanuel Congregation. Plans for financing are under consideration. Report later.

Windsor, Ont.
Contemplated, general hospital, $80,000. Owner, to be built and maintained jointly by Windsor and Walkerville. Report of investigating committee in favor of $80,000 structure has been approved and committee is now raising funds. Supplementary report later.

CONTRACTS AWARDED

Brantford, Ont.
Convent, $7,000. Owners, R. C. Church, Brantford. Architect, R. Clohesy Hamilton, Ont. General contractor, James Wright, Brantford. Carpentry and joiner's work let to John O'Neail, Brantford. 2½ storeys, pressed brick, 45 x 40. Heating and plumbing contract not let yet.

Cobourg, Ont.
Public buildings (heating) Owners, Counties of Northumberland and Durham. Clerk, N. F. MacNachtan, Coborug, Ont. Successful contractor, Millward & Son, Port Hope, Ont. Rooms to be heated. County offices, Court Room; town offices, opera house, lodge rooms, in Victoria Hall.

Fort William, Ont.
Theatre, $75,000 (Victoria avenue). Owner, J. C. Murray, Fort William; architect, Mr. Rapp, Chicago; general contractor, Seaman & Penniman, Fort William, Ont. 140 x 93, brick and stone. Contract let June 19th; building to be completed by December.

Fairville, N.B.
Post office, $17,400. Owners, Dominion government, Ottawa, Ont. Contractor, R. A. Corbett, St. John. Two storeys, 43 x 45, brick and stone. Building to be completed within the year.

Montreal, Que.
The contract for galvanized iron work and ventilation system for Victoria Hospital has been awarded to McFarlane & Doubglas, Ottawa. Cost, $8,000. James Ballantyne, Montreal, general contractor.

New Westminster, B.C.
Smith & Whittaker have been awarded contract for Lulu Island school, $3,500. Plans for two larger schools are being prepared. Special heating system to be installed.

Pincher Creek, Alta.
Public building. Owner, Dominion Government, Ottawa; R. C. Desrochers, Public Works Dept. secretary. Contractor, J. H. Hinton, Pincher Creek.

Shediac, N.B.
Aged People's Home, $30,000. Owner, Roman Catholic Church, Shediac; architect, R. A. Frechette, Moncton, N.B.; general contractor, S. R. Gaudet, Memramcook, N.B.; three storeys, 100 x 45 x 100 x 40, wood and stone. Contract let June 3, building to be completed March 1, 1912.

Sherbrooke, Que.
Fire hall, $3,100. Owner, City of Sherbrooke, Que.; architects, L. N. Audet, Sherbrooke; general contractor, Chas. Veneau, Sherbrooke, Que. Contract let June 19, building to be completed October 1st.

Monastry, $75,000 (Beckett street). Owner, Redemptorist Fathers, St. Anne De Beaupre, Que.; architect, L. N. Audet, Sherbrooke, Que.; general contractor, Lefebvre & Bonin, Sherbrooke, Que.; heating contract not let. Contract awarded June 20, building to be completed August, 1912.

Residences

Brandon, Man.
Plans prepared for apartment block, $70,000. Owner, A. E. Bullock, Brandon, Man. Architect, T. Sinclair, Brandon. 3 storeys, 100 x 65, Ferro concrete, Ferro concrete foundation, steam heating, electric light, maline plumbing, flat roof, cement work, cut stone, brick, reinforced concrete, structural iron, fire escapes, fireproof doors or windows, electrical work, telephone system, electric bells, roofing, interior finish undecided. No contract for construction will be let. Owner is contractor.

Brantford, Ont.
Extension of time for residence, 10,000. (Dufferin avenue). Owner, W. B. Preston, Brantford, Ont. Architect, L. D. Barber, Brantford, Ont. 40 ft. x 50 ft. tapestry brick, brick foundation, 3 storeys, slate roof, hot water heating, electrical work, hardwood interior finish. Tenders extended until June 28th.

Brockville, Ont.
Tenders called for residence. (King street East). Owner, Dr. E. B. Moles, Pine street, East. Architect, A. Stuart Allaster, 42 King street E., Brockville. 2½ storeys, 39 x 30, brick and stucco construction, stone foundation, hot water heating, electric lighting, shingles, southern pine, interior finish, cut stone, pipe covering, sheet metal work metalic lath, shingle stain, plate glass, art glass, prismatic glass, iron columns, mantels, cornice roofing, sheathing paper, 1st storey of common brick, 2nd half-timbered effect. Tenders called until June 21st.

London, Ont.
Tenders called for residence, $10,000. (Bridgeport street). Owner, J. E. Magee, 480 William street, London. Architects, Watt & Blackwell, 54 Bank of Toronto Chambers, London. 2 storey attic and basement, brick and cut stone, brick and cement foundation, electric lighting, hot water heating, shingle roof, interior colonial finish in white enamel and birch stained mahogany, electrical work, pipe covering, shingle stain, plate glass, mantels. Tenders called until June 30.

Oakville, Ont.
Tenders to be called for residence, 4,500. Owner, T. Thornton, Oakville. Architect, W. H. Mallory, 31 Queen street W., Toronto. 2½ storeys, 32 x 44, brick and stucco and shingle, hot air heating, electric lighting, shingle roof, hardwood floors, hall, etc. Tenders will be called in a few days.

Ottawa, Ont.
Tenders to be called for residence, $7,000. (Clemow avenue). Owner, Mrs. J. Angus McKenzie, Ottawa. Architect, A. Leb Weeks, Can. Life Building; brick, stone foundation, hot water heating, electric lighting, shingle roof, cement work, mantels, electric bells, shingle stain. Tenders received after next week.

Toronto, Ont.
Tenders to be called for residence, $2,700 (559 Gladstone avenue). Owner, E. J. Henley, 568 Gladstone avenue, Toronto; architect, Designing & Drafting Company, 36 Toronto street, Toronto. Two storeys, 32 x 20, brick, stone foundation, hot air heating, combination lighting, shingle and felt and gravel roof. Tenders received by owner.

Tenders to be called for residence (Keele street). Owners, F. A. Macabe, 288 Jarvis street, Toronto. Two storeys, 45 x 32 ft. 8 in., brick and stone, stone foundation, hot water heating, electric light, shingle and felt and gravel roof. Tenders to be called for heating, plumbing and lighting.

Specifications completed for residence, $5,000. (High Park Gardens). Owner, Weismiller & Mackenzie Bros., Queen street, Toronto. Private plans, 2½ storeys, 36 x 36, brick and stone, stone foundation, hot water heating, electric light, slate roof, hardwood finish.

Specifications completed for residence, $4,000. (Walker avenue). Owner, M. D. Grimshaw, 38 Toronto street, Toronto, 2½ storeys, 38 x 25 ft. 6 in., stone and brick, stone foundation, hot water heating, combined lighting, felt and gravel roofing, hardwood interior finish. Building to be commenced shortly by day labor.

Tenders to be called for residence. (Hurndale avenue). Owner, F. W. Hill, 92 Church street, Toronto. Private plans. 2½ storeys, 28 x 22, brick, brick foundation, hot water heating, electric light, slate or shingle roof, hardwood and pine finish. Carpentry and masonry have been let. Other work not let yet.

Specifications completed for residence, 1 pair semi-detached, $5,400 (s. s. Nina avenue). Owners, Grimshaw Bros., 38 Toronto street, Toronto. 2½ storeys, brick and stone, hot water heating, combination lighting, slate and felt roof, hardwood interior finish. Building will start about July 1st.

Specifications completed for five pair residence, $14,000. (Rainsford road). Owners, Grimshaw Bros., 38 Toronto street. Private plans, all 2 storeys, 38 x 34, brick construction, felt and gravel roof, concrete foundation, hot air heating, combination lighting. Building will be commenced shortly by day labor.

Tenders called for residence, $3,800. (9 Lynwood avenue). Owner, F. B. Eager, 11 Lynwood avenue, Toronto. Architect, J. H. Galloway, 23 Toronto street, Toronto. 2½ storeys, 36 x 27, brick and stone, stone foundation, hot water heating, electric lighting, shingle roof, oak interior finish, mantels. Tenders called until June 27th by architect.

Tenders to be called for residence, $6,000. (Eglinton, Ont.) Owner, J. H. Yonge, Grenville street. Architects, W. H. Mallory, 31 Queen W., Toronto. 1 storey, 43 x 55, brick, brick foundation, cement work, hot water heating, combination lighting, Spanish tile roofing, interior finish Georgia pine and hardwood floors, mantels. Tenders received after July 20th.

Vancouver, B. C.

Plans being prepared for apartment house. (Burrard street). Architects, Jones & Aspell, 347 Pender W. Vancouver. 3 storeys. Tenders will not be called for some time. Supplementary report later.

Tenders being called for apartment house. (Cor. Main and Lansdowne). Owner, Mr. Daulphney. Architect, Thos. Hooper, Winch Building, Vancouver. 6 storey 132 x 132 electric wiring, hot water heating, elevators. No special date for calling for tenders has been set.

CONTRACTS AWARDED

Halifax, N. S.

Dwelling house, $8,000. (Spring Garden road). Owner, C. N. S. Strickland, Halifax. Contractors, Faulkner & McDonald, Halifax.

Montreal, Que.

Eugene Bernier, Maisonneuve, has been awarded the general contract for the erection of a 3-storey brick and wood residence for D. W. Gagnon, 21 St. Julie street. Cost, $6,000.

Paris, Ont.

Residence, $3,500. Owner, Geo. A. Clerk, Paris, Ont. Architect, Taylor & Taylor, Brantford, Ont. General contractor, P. H. Secord & Sons, Brantford. 2 storey, brick and stone, 29 x 31. Heating and plumbing not let yet.

Toronto, Ont.

Residence, $10,000. Owner, W. del Schreiber; architect, A. J. Rattray, 123 Bay street, Toronto. Brick and stone, 2½ storey, dimension, 48 x 46. Mason, R. H. Harman, 156 Dupont street; carpenter, J. E. Ferris, Princess Theatre; plasterer, A. Petrie & Co., 549 Givens street; heating and plumbing, P. W. Snyder, 201 Pape avenue. Tenders awarded June 15th.

Residence, $5,000. Owners, C. Knowles, Toronto. Architect, Hy. Simpson, 88 King st. east, Toronto, 2½ storeys 25 x 45; brick and steel. Masonry, Forbes & Son, 65 Lee avenue, Toronto; carpentry, Cairns & Firth, 1 Auburn avenue. Other contracts not let yet.

Business Buildings and Industrial Plants

Amherstburg, Ont.

Business opportunities, small manufactures. Exceptional advantages offered to small manufacturers locating here. For further information address A. W. Marsh, Amherstburg, Ont.

Brantford, Ont.

Charter applied for. New industry. (Spring street). Owner Brantford Motor Truck Co., Ltd., capitalization $100,000. ($20,000 already subscribed). Sales agent, R. A. Bailey, Detroit, Mich. Provincial Directors, J. G. Cohoe, W. T. Henderson, E. L. Goold, J. E. Hammond, A. K. Bunnell, J. S. Dowling, and T. E. Ryerson, all of Brantford. Wilks & Henderson, Brantford, Solicitors.

Edmonton, Alta.

Plans being prepared for business building, $200,000. (Howard street). Architect, A. M. Jeffries, Edmonton, Alta. 3 storey, 100 x 100, sandstone, concrete foundation, steam heating, electric lighting, tar and gravel roofing. Plans being prepared and tenders will be called in time to commence work this year. Building known as Lands & Titles Building.

Building in progress for offices, $65,000. Owners, Pheasy & Batson, Edmonton, Alta. Architects, Pheasy & Batson, Edmonton. 5 storeys, brick and stone, concrete foundation, steam heating, electric light, cut stone, fire escapes, vaults, passenger elevator, sidewalk lift, skylights, electrical work, plate glass, steel beams, iron columns. Work has commenced on the block.

Plans being prepared for building, $40,000. (Jasper street west). Owner, J. E. Wize. Architect, J. E. Wize, Edmonton. 4 storey, 50 x 100, brick, concrete foundation, steam heating, electrical lighting, steel beams, iron columns, metallic lath, passenger elevator, tar and gravel roof. This is an addition to the present block, 50 x 100.

Fort William, Ont.

Contemplated, warehouse and offices, $75,000 (Hardisty street). Owner, Canadian Swift Co. 75 x 100, fireproof construction, cement work, reinforced concrete, freight elevator, fireproof doors or windows, steel beams, iron columns, Chicago firm preparing plans. Supplementary report later.

Proceedings in Council—warehouse, $100,000. Owner, International Harvester Company. Building Inspector, S. MacNamara. The City Council are favorably disposed towards the application of the International Harvester Co. According to agreement the company will build a large warehouse on C. P. R. property. Supplementary report later.

Halifax, N.S.

Destroyed by fire, lumber mill, $18,000. Owner, Moir's Ltd., Argyle street, Halifax. Plans for construction will soon be in progress.

Hamilton, Ont.

Equipment required for office building (Queen and Peter streets). Owner, Taylor Manufacturing Co., Princeton, Indiana, U. S., office furniture and fixtures required, also wood turning machinery, laths, etc. Larger plant to be built later. Products of manufacture store equipment and suit hangers.

Equipment required for office. Owner, Insulated Wire and Cable Co., Hamilton. Required office furniture and electric fixtures. Factory will be built later by [illegible]

Equipment required for office. (James street South). Owners, Imperial Bank. Required, furniture, fixtures, adding machine, etc. Particulars secured from head office, Wellington street, Toronto.

Equipment required for business building. (James N.) Owner, Arcade, Limited, Hamilton, Ont. Store on James North being re-fitted. Required, counters, fixtures, show-cases, office furniture, chairs, etc. For further information apply to Arcade Limited.

Moose Jaw, Sask.

Tenders called for bank, $40,000. Owner, Bank of Montreal. Architects, Peden & McLaren, Montreal, Qne. 2 storey and basement; 50 x 60, brick and stone, concrete foundation, structural iron, hot water heating, electric lighting, marble, tile, metallic lath, electric bells, plate glass, sheet metal work, steel beams, skylights plate glass, cornice, artificial stone, vaults, interior finish, oak and fir. Tenders received until July 5th. R. G. Bunyard, architect, Moose Jaw, superintending work.

Ottawa, Ont.

Plans completed for business building. Owners, Rolla L. Crain Co., Ltd., Wellington street, Ottawa. Architect, J. A. Ewart, Sparks street. 1 storey 60 x 190, brick, stone foundation, hot water heating, saw tooth roof, electric lighting, sheet metal work, electrical work, steel beams, fireproofing. The R. L. Crain Co. carry on the business of printing and lithographing. The date for calling tenders not set yet. Supplementary report later.

Tenders called for bakery (2 buldgs) Owner, Slinn-Shouldis Ltd., Ottawa. Architect, James Mather, Wellington street, Ottawa. 2 storeys 116 x 96 and 96 x 44, steam heating (2 boilers), electric lighting. Tenders called for plumbing, plastering, painting and electric wiring.

Port Hope, Ont.

Machinery required for canning factory. Owner, the Canadian Canners Co., Port Hope; manager, D. L. Matthews, Queen street, Port Hope. New and up-to-date machinery will be installed. Supplementary report later.

Steveston, B. C.

Contemplated business business building. Owners, B. C. Telephone Co., Vancouver. Erection of substation at Steveston under consideration. Preparation of plans not commenced; some time before building will commence.

Toronto, Ont.

Tenders called for office building. (King street west). Owner, Standard Chemical Iron & Lumber Co., Toronto; architect, F. S. Baker, 67 Yonge street, Torooto. Two storey and basement, 55 x 60, stone and brick, stone and brick foundation, steam heating, electric lighting, felt and gravel roofing, Georgia pine hardwood finish, cement work, marble, tile, metallic lath, structural iron, sheet metal work, vaults, skylights, iron columns, steel beams, cornice.

Tenders called for stores (Bloor St.). Owner, H. E. Stiles, Chelsea avenue, Toronto. Architect, J. Hunt Stanford, 31 Yonge street, Toronto. 2 storey 24 x 36, brick, stone foundation, hot water heating, combination lighting, shingle roof, interior finish pine and hardwood, plate glass, [illegible]

Tenders and For Sale Department

TO CONTRACTORS

Sealed tenders will be received for all trades required in the erection of an office building in King street, up to noon on June 30th, 1911.

The lowest or any tender not necessarily accepted.

F. S. BAKER, Architect,
Traders Bank Building,
25-26 Toronto, Ont.

Contractors' Material

IN CANADA

Blacksmith drill (power or hand) 10-in. swing.

Leonard Engine (Ball Aut. High Speed).

Sturdevant Steel Fan 35-in. diameter, 12½-in. outlet.

Two Beatty 1-yd. dredges.

One Beatty ½-yd. ditching dredge.

No. 6 Austin crusher, with screen, new 1907, used half time.

No. 5 Champion crusher, also screen.

Eight Steam Drills and one air drill.

50 h.p. Portable steam boiler.

Thirty tons 20 and 25 lb. relaying rails.

Have you anything to sell? Write us.

THE MALES COMPANY,
82 Perin Bldg., Cincinnati, Ohio.

CITY OF TORONTO

Tenders

For the

Construction of a Seawall

In Lake Ontario, in the Vicinity of the Exhibition Grounds.

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on **Monday, July 3rd, 1911**, for the construction of a Seawall in the vicinity of the Exhibition Grounds.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained on application to the Department of Railways and Bridges, City Engineer's Office, Toronto.

The tenderers shall submit with their tenders the names of two sureties (approved of by the City Treasurer not members of the City Council, or Officers of the Corporation of the City of Toronto), or in lieu of said sureties the bond of a guarantee company, approved of as aforesaid.

The lowest or any tender not necessarily accepted.

F. S. SPENCE,
Chairman of the Board of Control.

City Hall, Toronto,
June 14, 1911. 25-26

Notice to Contractors

Township of Blanshord

Sealed tenders addressed to the undersigned will be received up till 5 o'clock p.m., **Saturday, July 1st**, for the Construction of the Youngson Creek Drain in the Township of Blanshord. Plans, files and specifications of said Drain can be seen at Clerk's Office at Rannock, in the said Township. A marked cheque for ten per cent. of contract must accompany each tender. The lowest or any tender not necessarily accepted.

JNO. H. JAMESON,
25-26 Clerk, Township of Blanchord.

Bucket Crane

FOR SALE—One full circle, self-propelling, modern 10 to 15-ton capacity Browning size No. 1 Locomotive Crane, standard gauge, 4-wheel truck, 38 ft. steel boom, 8 x 10 engines, equipped to handle Clam or Orange Peel. Will furnish with or without bucket. Attractive price, fine condition, quick delivery. Inspection here.

WILLIS SHAW MACHINERY CO.
39 So. LaSalle Street, Chicago.

Sealed tenders addressed to the undersigned, and endorsed "Tender for Harbour Works in Courtenay Bay, St. John, N.B.," will be received until 4 p.m., on **Thursday, August 10th, 1911**, for the construction of a Breakwater, Wharves, for the Dredging of a channel and basin, and for the Filling shown on plan and also for the Construction of a Dry Dock and Ship Repairing Plant of the First Class under "The Dry Docks Subsidies Act, 1910.

Plans, specification and form of contract can be seen and forms of tender obtained at this Department, at the offices of E. T. P. Shewen, Esq., District Engineer, St. John, N.B.; J. K. Scammell, Esq., District Engineer, St. John, N.B.; C. E. W. Dodwell, Esq., District Engineer, Halifax, N.S.; A. R. Decary, Esq., District Engineer, Post Office, Quebec, Que.; J. L. Michaud, Esq., District Engineer, Merchant's Bank Building, St. James Street, Montreal, Que.; J. G. Sing, Esq., District Engineer, Confederation Life Building, Toronto, Ont.; H. J. Lamb, Esq., District Engineer, London, Ont.; and at the office of the High Commissioner for Canada, London, Eng.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature of the occupation and place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, payable to the order of the Honourable the Minister of Public Works, for the sum of five hundred thousand dollars ($500,000), which will be forfeited if the person tendering decline to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,
R. C. DESROCHERS,
Secretary.

Department of Public Works,
Ottawa, June 9, 1911.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 25-26

Plans Wanted

Competitive designs will be received by the undersigned up to and including **July 5th, 1911**, for a skating and hockey rink, size of ice space 75 x 180 feet, and seating capacity to be not less than 2,500, building to cost approximately $7,000. Plans to remain the property of the designer, same to be returned to the unsuccessful competitors.

Two and one-half per cent. will be paid to the architect whose designs aer accepted, for working plans and specifications.

R. C. MACFARLANE, Secretary,
Niagara Falls Hockey & Athletic Club, Ltd.,
25-26 Niagara Falls, Ont.

CITY OF MOOSE JAW

Saskatchewan

TENDERS

Sealed tenders addressed to the undersigned City Clerk will be received in the Council Chamber, Moose Jaw, up to 8.30 p.m. on **Monday, July 24th, 1911,** for the supply of the following electrical apparatus:—

Contract A.

Fifty 6.6 Ampere, Direct Current, series, Metallic flame arc lamps, complete with globes, etc.

Fifty Absolute cut-out hangers.

One Current Regulator, 50 lamp circuit.

One Mercury Rectifier, 50 lamp circuit.

One Control panel with switches, 50 lamp circuit.

Contract B.

Fifty ornamental arc lamp standards.

Full particulars and specifications may be obtained from J. D. Peters, Electrical Superintendent, Moose Jaw, Sask.

The lowest or any tender not necessarily accepted.

W. F. HEAL,
25-28 City Clerk.

St. Catharine's Water Works

Tenders

Sealed tenders addressed to "The Chairman of the Commission," marked "Tender for Pipe Laying," or "Tender for Tunnel," will be recieved up to noon on **Thursday, July 13th, 1911,** for—

Section "A."

4,200 lineal feet Rock Tunnel, 5 ft. x 8 ft.

Section "B."

Excavation and pipe laying 5,000 ft. 24 in. and 30 in. cast iron pipe. 36 in. cast iron intake pipe. Concrete intake and Valve Chambers. Building auxiliary reservoir.

Section "C."

Excavation and pipe laying 15,000 ft. 24 in. cast iron pipe.

Specifications and plans may be seen and forms of tender obtained at the office of the Waterworks Commission, City Building, James street.

The Commission reserves the right to reject any or all tenders, or to accept any tender which shall appear in its interest.

ALEX. MILNE,
Superintendent.

St. Catharines, Ont.
June 17th, 1911. 25-26

Concrete Abutments

Tenders will be received for building concrete abutments at Armstrong's Bridge on the Perth-Waterloo County line, 3 miles south of Millbank.

Letting July 11th, at 2 p.m.

For particulars apply to the Engineers.

BOWMAN & CONNOR,
26-26 Berlin, Ont.

CITY OF SYDNEY, N.S.

Notice to Contractors

Sealed proposals addressed to the Board of Works, and endorsed "Tender for Paving Charlotte Street, Sydney, N. S.," will be received by the City Clerk, at his office in the City Hall, up to and until 5 o'clock p.m., on **Tuesday, the Fourth day of July, 1911.**

Plans and specifications may be seen at the office of the Contract Record, 220 King street, West, Toronto.

Plans, specifications, forms to tender, contract, etc., and all other information necessary, may be obtained frim the City Engineer.

The lowest or any tender will not necessarily be accepted.

JAMES J. CURRY,
26-26 City Clerk

BOARD OF EDUCATION

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board, will be received until

Friday Noon, June 30th, 1911, for

- **Enlargement of Essex St. School.**
- **Enlargement of Manning Ave. School.**
- **Steam Heating and Plumbing.**
- **Cabinet Work.**
- **Mid-Summer Repairs.**
- **Tinsmith, Stove and Furnace Work.**
- **Iron Stairs,**
- **Iron Fences.**
- **Hydraulic Hoists.**
- **Lawn Mowers, Hose and Hardware.**
- **Linseed Oil, Turpentine, White Lead.**
- **Floor Oil and Lubricating Oils.**

Specifications may be seen and all information obtained at the office of the Superintendent of Buildings, City Hall. Each tender must be accompanied with an accepted bank cheque for five per cent. of the amount of tender or its equivalent in cash. Tenders must be in the hands of the Secretary-Treasurer at his office in the City Hall not later than 12 o'clock noon on the date named, after which no tender will be received. The lowest or any tender will not necessarily be accepted.

W. W. HODGSON, W. C. WILKINSON,
Chairman of Committee. Sec.-Treas.
Toronto, Ont 26-26

SALESMEN WANTED

Ten Dump Wagon Salesmen. Must have experience in selling contractors and dealers. Are required to go any place in the country where business develops. Good salary to right parties. In answering this ad. state age, where now mployed or where formerly employed and reason for quitting or wanting to quit; experience if any, in selling or using dump wagons; salary expected; when can go to work. If know anyone to whom can now sell dump wagons, give names. Give three references and state if can give bond, personal or otherwise. Don't expect reply from this unless your answer to this is complete and your record will show you a successful salesman.

THE TROY WAGON WORKS CO.
26-26 Troy, Ohio.

For Sale

Steam and Electric Machinery displaced by Niagara Power. One 125 horse power, one 225 Compound Condensing Wheelock Engines in good condition. Boilers, 14 ft. x 60 in. and 12 ft. x 48 in. complete with iron work and steam connection. Condensers, heaters, belt tighteners, pulleys and shafting. Direct Current Electric Dynamos and Motors from one to eighty horse power. Bargain prices. Write for particulars.

W. R. REYNOLDS,
Supt., Power & Light Commission,
25-27 Ingersoll, Ont.

Tenders for a Steel Bridge

Sealed tenders marked "Tender for Grand River Bridge," will be received by the undersigned up to one o'clock p.m. **Tuesday, July 4, 1911,** for the construction of a 115-foot span over the Grand River, about one mile from Waldemar.

Specifications and forms of tender may be obtained from the undersigned. The lowest or any tender not necessarily accepted.

C. R. WHEELOCK,
County Engineer.
Orangeville, Ont 26-26

Tenders

for Fire Hose, Motor Driven Combination Chemical Engine and Hose Wagon. Fire Alarm Boxes and Wire and Cable for Fire Alarm Telegraph.

Fire Hose, Motor Driven Combination Chemical Engine and Hose Wagon. Fire Alarm Boxes and Wire and Cable for Fire Alarm Telegraph.

Tenders addressed to the undersigned will be received by registered post only up to noon on **Tuesday, July 4, 1911**, for supplying the articles above mentioned.

Specifications and forms of tender, together with the conditions governing tenders, as prescribed by city by-law, may be obtained upon application at the office of the fire department, Richmond street fire hall, Toronto.

The lowest or any tender not necessarily accepted.

F. S. SPENCE,
[illegible]

City Hall, Toronto.
June 21st, 1911.

TOWN OF OSHAWA, ONT.

Sedimentation Tanks, etc.

Sealed tenders, accompanied by a marked cheque for $500 will be received up to **Saturday noon, July 1st, 1911,** for the construction of screening chambers, sedimentation tanks, sludge beds and all appurtenances thereto.

Plans and copies of specications are held for inspection at the offices of the "Contract Record," 220 King street west, Toronto; the "Canadian Engineer," Church street, Toronto, and the office of Mr. T. Aird Murray, C.E., Consulting Engineer, Lumsden Building, Toronto.

Copies may be obtained from the Town Engineer, together with forms of tender, upon deposit of a fee of $1.00, which will be returned when plans are returned.

W. E. N. SINCLAIR, B.A., L.L.B.,
Mayor.
FRANK CHAPPELL,
Town Engineer.
Town Hall, Oshawa.

The Algoma Central and Hudson Bay Railway Company

Tender for Railway Construction

Sealed tenders for the construction of the Algoma Central Railway Extension from Hobon on the C. P. R., northerly to the National Transcontinental Railway at a point approximately 142 miles west of Cochrane, a distance of 101 miles, will be received up to noon **July 15, 1911.**

The work includes all construction work to sub grade, and in addition, track laying and ballasting in accordance with plans, profiles, forms of tender and specifications at the office of the Chief Engineer, Sault Ste. Marie, Ontario.

All tenders to be marked "Tender for Construction," and to be addressed to R. S. McCormick, Chief Engineer, Algoma Central Railway, Sault Ste. Marie, Ontario.

The lowest of any tender not necessarily accepted. 26-28

TENDERS

for Steel and Concrete Bridge

Mud Lake Narrows

TOWNSHIP of CARDEN

County of Victoria

Tenders will be received by the undersigned until **Wednesday, July 5th, 1911,** for the following works:—

1. Two steel spans with concrete floors, each 60 feet over all, 14 feet roadway between curbs, to carry a 10-ton roller at least, and to be approved by the Engineer of Highways of the Department of Public Works of Ontario.
2. One 120 feet span, same width and relative strength.
3. Three concrete piers to receive two 60-ft. spans.
4. Two concrete piers to receive one 120-ft. span.
5. Stone filling of approaches.

Plans and specifications may be seen at the office of the County Clerk, Lindsay and Whitby.

The committee claims the right to accept a tender for either two spans or one span; three piers or two piers and to decline any or all of the tenders.

J. R. McNEILLIE,
Clerk, County of Victoria
Lindsay, June 12, 1911.

Tenders Wanted

[illegible] will be received by the under[illegible] the 10th day of June, 1911 [illegible] for a new [illegible] the Chalmers [illegible] Woodstock.

Plans, specifications and further information may be obtained from J. A. McKay, chairman, Building Committee, 119 Oxford street, or at the office of the architects, Chapman, McGiffin [illegible] Toronto.

The lowest or any tender not necessarily ac[illegible]
26-26

TOWN OF MIDLAND

Sewerage Works

[illegible] will be received by the Town Clerk up to noon of **July 8th, 1911**, for the labor and materials required for the construction of Sanitary Sewers, comprising about 4,700 lineal [illegible]

Plans and specifications may be seen at the office of the Engineers, Chipman & Power, Mail Building, Toronto, or at the Town Clerk's office, [illegible]

Each tender must be accompanied by an accepted bank cheque equal to five per cent of the contract price. The lowest or any tender not necessarily accepted.

FRANK R. WESTON,
Town Clerk,
26-26 Midland, Ont.

TOWN OF STEELTON

PROVINCE OF ONTARIO

Tenders for Cement Walks

NOTICE TO CONTRACTORS

Sealed tenders will be received by the Town Clerk until 8 p.m. on **Tuesday, July 4th, 1911**, for the construction of about 72,000 square feet of cement sidewalks and 7,200 lineal feet of cement curb.

Plans, profiles, and specifications may be seen at the office of Messrs. Chipman & Power, Town Hall, Steelton, Ont.

A certified cheque for $500 shall accompany each tender. The lowest or any tender not necessarily accepted.

JAS. LYONS, Esq., Mayor,
Steelton, Ont.
J. ROBINSON, Esq., Town Clerk,
Steelton, Ont.
CHIPMAN & POWER, Engineers,
26-26 Toronto, Ont.

TOWN OF STEELTON

Province of Ontario

Tenders for Storm Sewer, Cement Curb, and Macadamized Roadway.

NOTICE TO CONTRACTORS

Sealed tenders will be received by the Town Clerk until 8 p.m. on **Tuesday, July 4th, 1911**, for the construction of about 1,050 feet of 12-inch vitrified pipe storm sewer, including catch basins and manholes; about 2,750 feet of concrete curb; and about 6,400 square yards of macadamized roadway.

Plans, profiles, and specifications may be seen at the office of Messrs. Chipman & Power, Town Hall, Steelton, Ont.

A certified cheque for $500 shall accompany each tender. The lowest or any tender not necessarily accepted.

J. LYONS, Esq., Mayor,
Steelton, Ont.
J. ROBINSON, Esq., Town Clerk,
Steelton, Ont.
CHIPMAN & POWER, Engineers,
26-26 Toronto, Ont.

Tenders for Vault Fitting

Sealed tenders will be received by the undersigned until noon on **Tuesday, July 4th, 1911**, for steel fittings for the south vault of Registry office for North and East Middlesex, being on Court House Square in the City of London. Vault room 14 ft. by 24 ft.

Plans and specifications of the proposed work to be submitted with tender.

CHAS. TALBOT, County Engineer.
T. E. ROBSON, County Clerk.
London, Ont., June 26, 1911. 26-26

Positions Vacant

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

Stone Masons Wanted—A few good stone masons wanted, to build random Ashler stone work, required at the building of a Parish Hall, for All Saints Church, Collingwood, Ontario. Apply Philip C. Palin, Architect, Collingwood, Ont. 25-26

(Continued from page 59.)

tles, tile. Owner will call for tenders after June 22nd.

Tenders called for office building. (King street). Architect, F. S. Baker, Traders Bank Building, Toronto. Tenders called until noon June 30, for erection of building. See advertisement in "Tenders and For Sale Department" of this issue.

Tenders to be called for Machine and repair shops, $2,500. (West Lodge avenue). Owners, Gutta Percha Rubber Co., Yonge street, Toronto. Company engineer, A. Sullivan, 114 O'Hara avenue, Toronto. 2 storey, reinforced concrete, hot water heating, electric lighting, concrete roof. Tenders received after June 24th.

Tenders to be called for warehouse, $40,000. (O'Hara avenue). Owners, The Gutta Percha Rubber Co., Yonge street, Company's engineer, A. Sullivan, 114 O'Hara avenue, Toronto; reinforced concrete, hot water heating, 3 storey and basement, 170 x 50, electric lighting, concrete and gravel roof. Tenders caller after June 24th. Machinery not purchased yet.

Vancouver, B.C.

Plans being prepared for office building (Hastings street). Owner, J. K Sutherland, 1901 Barclay street, Vancouver; architect, Parr & Fee, 570 Granville street, Vancouver; 6 storeys, store and offices. Tenders for excavation have been called. Supplementary report later.

Plans presented to inspector for three buildings. BuildingInspector , Mr. Jarrett. One 7-storey brick block, Granville street, 50 x 120 feet, stores on ground floor and apartments upstairs. Presented by C. F. Perry; two 6-storey brick block, 110 Water street, 33 x 120, cost about $75,000. Grant & Henderson, 413 Granville street, prepared plans. Owner, A. Williams.

Specifications in progress for warehouse (Alexandra street). Owners, McLennan McFeeley Co., Columbia and Cordova, E. Vancouver. Architects, Parr & Fee, 570 Granville street, Vancouver. 1 storey, 400 ft. long. The plans for large warehouse are indefinite. Tenders on the above had not been called under date of last information.

Tenders to be called for stores, $7,000. Owner, A. D. Bowlby, Windsor. Architects, Crane & Pennington, Windsor, Ont. 2 storey 48 x 50, brick foundation, hot air heating, electric and gas, composition roofing, Georgia pine interior finish, cement work, cut stone, brick, tile, structural iron, sheet metal work, metal ceiling, skylights, plate glass. Date for receiving tenders not set yet.

CONTRACTS AWARDED

Edmonton, Alta.

Store, $55,000. (Jasper street East). Owner, Jackson Bros., Edmonton. Architect, A. McGoon, Edmonton. General contractors, Pheasy & Batson, Edmonton, Alta. 3 storeys, brick and stone, concrete foundation, steam heating, electric light, tar and gravel roofing, cement work, cut stone, metallic lath, fire escapes, plate glass, vaults, sidewalk lift. Excavation has commenced.

Hamilton, Ont.

Addition to store, $8,500. Owner, A. M. Soutar & Co., King and Parke streets, Hamilton. Architect, Stewart & Witton, King and Parke streets,Ha milton. 4 and 5 storeys high, 65 x 30, mill construction. Contract for brickwork let tn Mitchell & Riddell, Hamiltoo, June 15th.

Halifax, N. S.

Warehouse, $10,000. (Upper Water street). Owner, James Simmond & Co. Contractor, George B. Low, Halifax.

Montreal, Que.

H. Kellert & Sons, Royal Building, have awarded contract to C. E. Deakin for 4-storey light manufacturing building, concrete and terra cotta, 75 x 120, on St. Catharine street. Cost $50,000.

Ottawa, Ont.

Warehouse., Owners, J. M. Garland & Son, Ottawa. Architect, A. Leb Weeks, Canadian Life Building, Ottawa. General contractor, A. Garvock, Queen street, Ottawa. 6 storeys and basement, 52 x 66, reinforced concrete, concrete foundation, steam heating, electric light, tar and gravel roofing. Contract let June 18th. Tenders called for plumbing, steam heating, sprinkler system, and freight elevator.

Toronto, Ont.

Warehouse, $9,000. (479 Wellington street west). Owner, G. B. Meadows, 5 Sussex avenue, Toronto. Architect, W. H. Mallory, 31 Queen West, Toronto. General contractors, Fussell & Thomas, 406 Dupont street, Toronto. 2 storeys, 63 x 48 brick construction. Contract let June 15th.

Power Plants, Electricity and Telephones

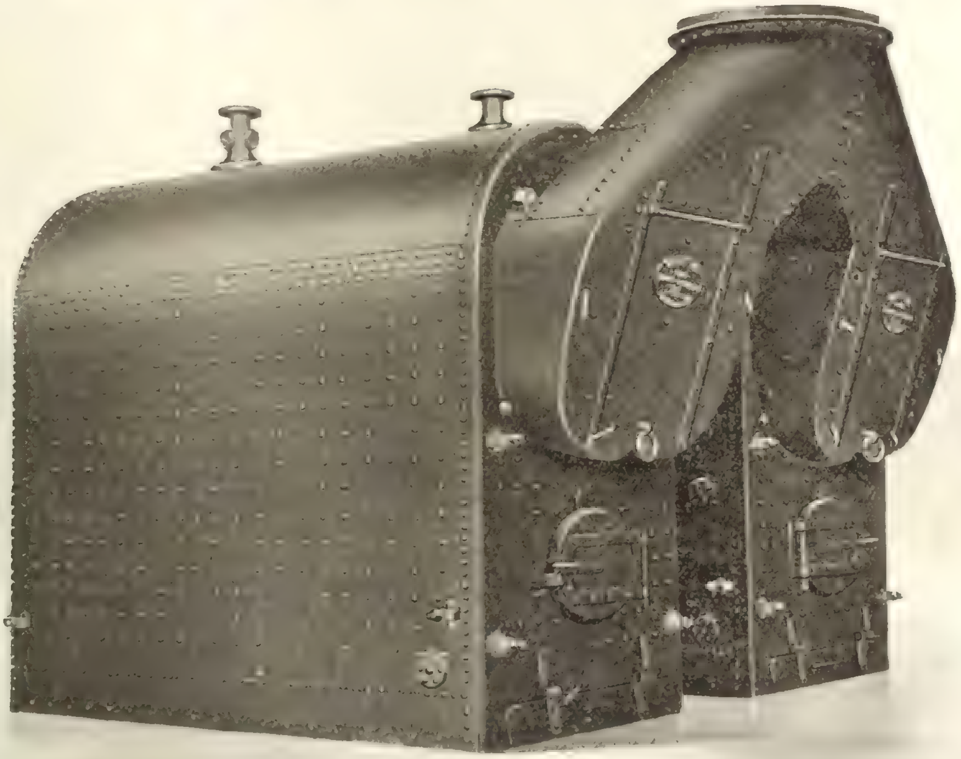
Edmonton, Alta.

Report under consideration for gas plant, $230,000. Parties interested, Edmonton City Council and J. Coates, representing British capitalists. Building 200 ft., provision to be made for installation of sufficient machinery to ensure the manufacture of 125,000 cu. ft. of gas per day and laying of 15 miles of mains. Supplementary report later.

Ingersoll, Ont.

For sale—steam and electric machinery. Owner, Power and Light Commis-

BOILERS



Fitzgibbon Type of Boilers built for McLachlin Bros., Arnprior, Ont.

BOILERS, of All Kinds for Any Service

"Inglis" Boilers are Designed and Built by Skilled and Experienced Workmen.

"Inglis" Boilers are Built of the Best Material that can be procured.

"Inglis" Boilers are Made in Shops Equipped with the Latest and Most Modern Machinery.

Workmanship, Quality, Quick Delivery and Fair Prices, together with Fifty-Two 52 Years' Practical Experience, have made "INGLIS" Boilers the "Standard." Write us for prices.

The John Inglis Company Limited

Engineers and Boilermakers

14 Strachan Ave., TORONTO, Canada

[illegible] Ingersoll, Ont. Steam and electric [illegible] 250 h.p. [illegible] 225 com[illegible] Wheelock engine in [illegible] boiler 14 ft. x 60 ins. [illegible] complete with iron [illegible] condensers, heaters, belt tighteners, pulleys and shafting, direct current electric dynamos and motors from one to eighty h. p. For further particulars write W. R. Reynolds, Supt. Power & Light Com[illegible] See advertisement in "Tenders and For Sale Department" [illegible]

Martitown, Ont.

Negotiations in progress for new telephone company. Owner, Martintown Telephone Co. Pres., A. Climgen; secretary, Hy. Kinloch. Organization of joint stock company to erect and operate lines in this locality in connection with the Bell Telephone. Steps being taken to secure subscribers to stock.

Sarnia, Ont.

Plans will be prepared by the town engineer for the installation of a municipal lighting system. Negotiations are pending for the purchase of the Sarnia Gas & Electric Light Company. A generator will be located at the Sarnia waterworks.

St. John, N.B.

A Toronto concern is asking for privilege of establishing electric power and heating plant at Milltown, N.B. Address town clerk, Milltown.

Vernon, B. C.

Tenders called for generator. Owner, City of Vernon. City Clerk, D. G. Tate. 200 kw.; 3 phase 60 cycle; 2,200 volt with 2 panel switchboard and exciter. Specifications at office of City Superintendent. Tenders received until June 26, by city clerk.

Miscellaneous

Ottawa, Ont.

The following contracts have been awarded by the Public Works Department of tne Dominion Government: River Thames, Ont., dredging, to W. E. Finn, of Welland, 35 cents per cubic yard; Eryner's Cove, N.B., wharf, to John J. Kane, St. John, N.B., $2,998; Point Sapin, Kent County, N.B., breakwater, to Warren Taylor, of Salisbury, N.B., $16,890; Fassett, Que., wharf, to Thomas Morin and John Morin, of Arnprior, $5,955; Leve, P.Q., armory, the Ideal Construction Company, Quebec, for $62,995; Mahone Bay, N.S., dredging, to Beazley Bros., Ltd., Halifax, at 40 cents a cubic yard; Vancouver, B.C., metallic fittings to office of superintendent of railway service, to Eclipse Manufacturing Company, of Toronto, for $4,495; Little Anse, N.S., break-

Strassburg, Sask.

By-law carried for fire apparatus, $5,000. Owner, Corporation of Strassburg. Sec. treas., E. F. Steadman. By-law to borrow $5,000 for purchase of fire fighting apparatus was carried.

Vancouver, B. C.

By-laws carried for engineering, $1,310,000. Owner, City of Vancouver. W. McQueen, city clerk. Sewers, $750,000; Seymour water works; extension, $1,000,000; Hast. Townsite street improvements, $75,000; water system, $75,000; Clark street and widening, wharves $35,000; D. L. 301 water system $115,000; streets $60,000; street improvements, Seymour $100,000.

Westmount, Que.

Equipment wanted for fire station. City Engineer, A. Currie, Westmount, Que. Combined chemical and hose wagon of the motor type. Tenders called for construction of station in about two weeks.

Building Permits

Calgary, Alta.

The following building permits were issued recently: P. N. Gordon, $4,000 house, Twelfth street, between Seventeenth avenue and Colborne Crescent; Alliance Investment Company, $3,000 house, Twelfth street, between Seventeenth avenue and Colborne Crescent; W. S. McDonald, $2,500 house, Mount Royal; G. W. Henderson, $2,500 house, Mount Pleasant; H. Templeton, $2,600 house, Mission.

Ottawa, Ont.

The building permits issued recently include: W. C. Edwards Co., factory, Green Island, Sussex street, $15,000; T. J. Somerville, dwelling, Arthur street, $3,500; James Hill, dwelling, Cartier st., $4,000; Kastrel Cohen, dwelling, Archibald street, $5,800; Lincoln Johnson, dwelling, Sunnyside avenue, $5,000; Soloman Coplan, dwelling, Osgoode street, $7,000; J. W. Nimmo, dwelling, Carling avenue, $3,000; S. B. Caldwell, dwelling, Blackburn avenue, $3,100; F. W. Burn, shop and dwelling, W. E. Noffke, architect, T. C. James and Alex. Christie, builders, $7,000; Henry Hayley, dwelling, Chapel street, cement veneer, $3,300; Jas. S. Wilson, dwelling, Chapel street, $9,500; D. J. Harris, shop and dwelling, Lisgar street, $5,000; Gilpin & Holcomb, hotel, Sussex street; C. J. Burritt, architect, T. C. James, builder, $21,000; Chas. Goodall, dwelling, R. E. McKinetry, builder, Woodlawn avenue, $4,000; A. L. Foster, dwelling, Hopewell avenue, R. E. McKinstry, builder, $4,000.

Toronto, Ont.

Recent building permits include:—G. Philips, 5 att. 2-storey brick stores and dwellings, Bloor street west, $17,500. P. H. Lambert, 3 att. 2-storey brick stores and dwellings, on Danforth avenue, $9,000. A. W. Williams, 2-storey and attic brick dwelling, St. Andrews Gardens, $5,500. W. H. Wright, 3 att. 2-storey brick dwelling, Cooper avenue, $6,000. W. E. Galley, 2-storey brick garage, on Sussex and Mews Lane, $5,000. W. F. McCutcheon, 3 att. 2-storey brick dwelling, on 125-5-7 Perth avenue, $5,600. J. T. Knifton, 3 det. 2-storey brick dwelling, near Campbell, on S. S. Wallace, $6,000. H. & C. M. Pascoe, 3 att. 2-storey brick dwelling, on S. E. corner Spruce Hill Road and Sycamore, $6,500. Syken & Knox, 1 pr. semi-det. 2½ storey brick dwelling, near Bloor, on Pauline, $5,200. Dr. Clarkson, 1 pr. semi-det. 2-storey and attic brick dwelling, near Abbot, on Indian Road, 5,000. A. E. Fisher, 2 det. 2½-storey brick dwellings, near Howard Park, on Indian Road, $6,000. W. H. Wright, 3 att. 2½-storey brick dwelling, near Indian Road, on Indian Crescent, $7,500. W. D. Beath & Son, 1-storey steel and concrete factory near Kingsley, on Symington, $6,000. A. H. Garrett, 3 att. 3-storey brick stores and dwelling, on 600-2-4 Bloor W., $11,000. D. K. Ridout, 2½-saorey brick dwelling, on 484 Avenue Road, $17,000. G. A. Harper, 2-storey and attic brick dwelling, near Heath, on Warren Road, $8,500. W. E. Cummer, 2½-storey brick and stucco dwelling, near Queen street, on Balsam, $6,500. Wm. Pigeon, 3 attl 2-storey stone and brick dwelling, near St. Clair, on St. Clarens avenue, $5,000. W. Pennock, 4 pr. semidet. 2½-storey brick dwelling, near Bloor, on W. S. Pauline, $20,000. L. Schepp, 2-storey brick factory, on 18-20 Spadina avenue, $8,000. Ansman & Marshall, 2 pr. semi-det. 2½-storey brick dwelling, near Palmerston, in N. S. Palmerston Gardens, $8,500. F. E. Parsons, 3 att. 2-storey brick dwelling, near Logan, on N. S. Wolfrey, $6,000. Urquhart & Sharp, 1 pr. semi-det. 2-storey brick dwelling, on 62-64 Symington avenue, $5,000. R. Lankin, 2 pr. semi-det. 2-storey R.C. dwelling, brick fronts, on 142-8 Curzon street, $6,400. A. J. Jackson, 2½-storey brick dwelling, on Deer Park Crescent, $5,800. Henry Wright, 2½-storey bricw dwelling, on 582 Avenue Road, $14,000. Jos. Waller, 1 pr. semi-det. 2-storey and attic brick dwelling, near Callendar, on S.S. Harvard, $6,000. F. Gordon Osler, 2½-storey brick addition to dwelling on 6 Rosedale Road, $5,000. J. H. Young, 2-storey brick apartments, on 48 Grenville street, $5,200. Chambers & Minaker, 3-det. 2-storey R. C. dwelling, on Sproatt, near Jones, $5,500. H. M. King, 3 det. 2½-storey brick dwellings, near Wright, on W. S. Indian Road, $9,000. John New, 3-storey brick apartments, near Sherbourne, on N. S. Bloor, $15,000.

Vancouver, B.C.

Recent permits include: J. S. Mathers, dwelling, 1343 Maple street, $3,800; Jas. C. Farlong, dwelling, 2610 McGill street, $2,500; John F. Ross, dwelling, 510 St. George street, $3,000; Parker & Allan, dwelling, 2173 Third avenue west, $2,500; S. MacDermid, dwelling, 1746 Trutch street, $4,000.

Winnipeg, Man.

Recent permits include :

L. Jorunason, apartment house on Furby street and Church avenue, $35,000. P. M. Clemens, architect.

J. Isenberg, apartment house on Church avenue to cost $30,000.

Standard Chemical Iron & Lumber Company, warehouse, Higgins avenue, $16,000.

Foster & Co., two dwellings, McMillan avenue, $8,500.

J. Miles, stores and tenement on Selkirk avenue, cost $6,000.

F. Johnson, double dwelling, Sherburn street, $3,500.

Imperial Oil Co., cooperage building on Alexander avenue, $3,000.

R. Taylor, three dwellings on Dorchester avenue, $18,000.

R. James, two dwellings, Elgin avenue, $5,600.

A. Bercovitch, stores and apartments, Selkirk avenue, $6,000.

MacLean Daily Reports

The only systematic method yet devised for reporting BUILDING AND ENGINEERING projects from their inception to completion. Ask us for Rates and Specimen Reports.

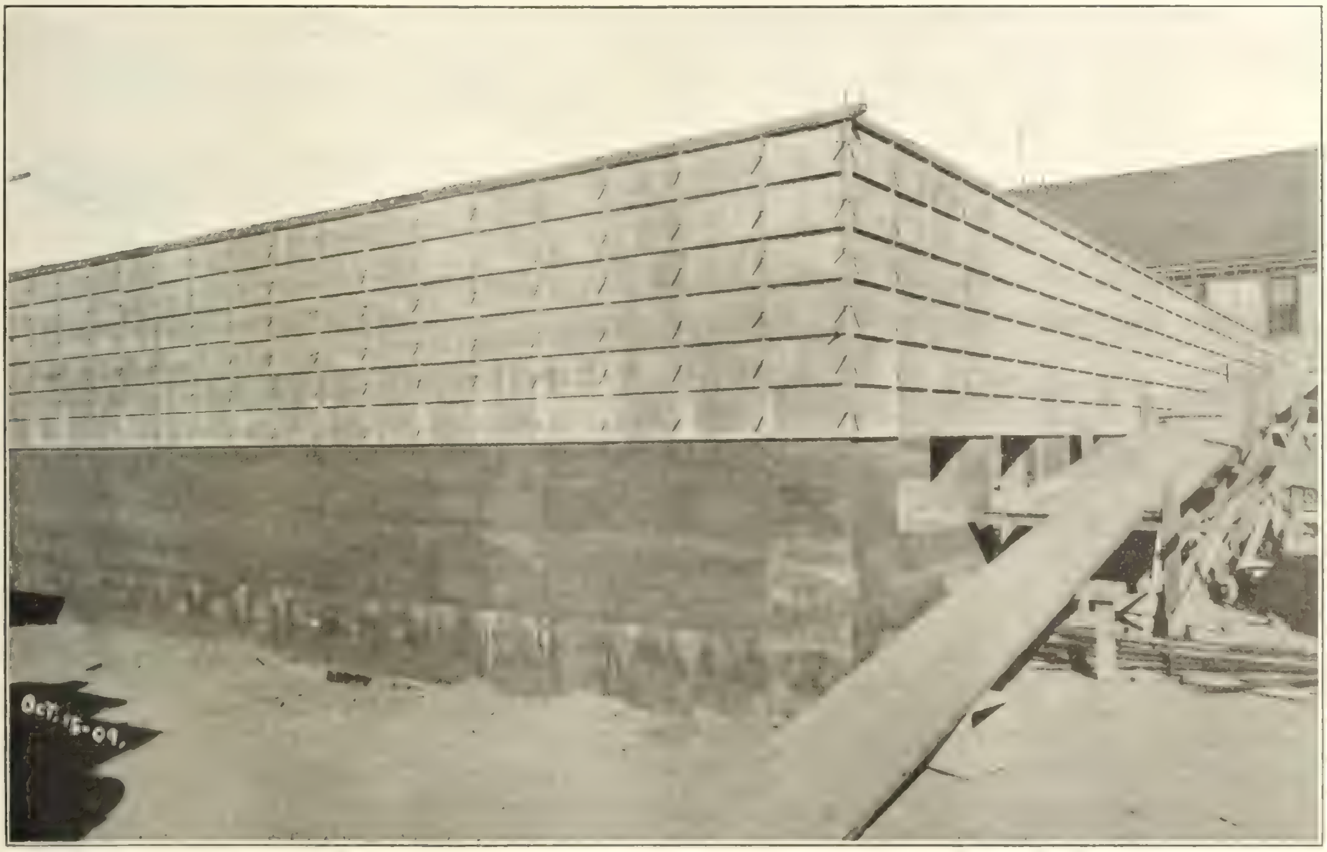
220 King Street West - TORONTO

The United States Steel Corporation, at Gary, Ind.;
Stone & Webster Engineering Corporation, Minneapolis, Minn.;
A. Monsted Co., Milwaukee, Wis.;
Geo. B. Swift Co., 903 Security Building, Chicago
Pacific Coast Condensed Milk Co., Seattle, Wash.;
Sheffield Farms-Slawson Decker Co., Amenia, N.Y.; and
Inland Steel Co., Indiana Harbour, Ind.
are among the largest users of concrete in the United States. They, and many others are using

Reichert Metal Forms

And Saving from 3 to 7 cents per square foot

Why do YOU stick to the old methods and
let this additional profit slip away from you?



Four courses of Reichert Metal Forms on walls of Concrete Business Block at Milwaukee. Note entire absence of obstructive bracing.

Reichert Mfg. Co.

Milwaukee, Wisc., U.S.A.

The Elmitt Lumber Co. Limited
OTTAWA, ONT.

Specialize in

Southern Pine
Timber and Piles

Also

Fir, Hemlock, Spruce,
Pine and Oak Timber
and Lumber.

N. B. — Can supply 10,000 Green Tamarac Piles.

Municipal Contracts Should be Let at the Lowest Possible Figure

You cannot secure low bids unless you place your proposition before a large number of contractors. The larger the number, the greater the competition and consequent saving on your contract.

More contractors look for proposed work in the

ESTABLISHED 1886
Contract Record
A weekly Journal of
Building Contracting Engineering Public Works
Municipal Progress Advance Information

than in any other publication. A moderate expenditure in the advertising of proposals will convince you of the service that the CONTRACT RECORD can give you. When you have "Tender" advertising to place do not forget that this paper carries more advertising of this sort than any other journal. CONTRACT RECORD, 220 King St. West, Toronto.

"Mimico" Brand Doing Well

The Ontario Sewer Pipe Company, Limited, Mimico, Ont., are working at full capacity to cope with the demands of one of the most active seasons they have yet experienced. A continuous policy of improvement is followed and extensive crushing machinery has lately been installed at the company's plant. The kiln capacity has been increased 15 per cent. this spring. The superintendent of the Ontario Sewer Pipe Company's plant is Mr. Albert L. Garee, who has had thirty years' experience among up-to-date plants in the United States and Canada. About fifty employees are engaged at the plant; about half of these are skilled workmen. The plant is replete with the most modern improvements known in this line of business and is equal to all demands. The output during 1910, which was also a good year, was 700 cars, but this will probably be increased 50 per cent. during 1911. The company has good prospects all through Ontario, but, as intimated above, they anticipate a record season this year in and around Toronto. The demand for "Mimico" brand pipe is growing very rapidly, and the company has good reason to feel some gratification. Mr. A. D. Harris is president of the Ontario Sewer Pipe Company, Limited; R. H. Stelton, general manager, and Andrew Dods, secretary-treasurer.

The definition of rock in sewer specifications recently adopted by the Board of Local Improvements of Chicago is as follows:

Wherever the word "rock" occurs in these speiifications it shall be interpreted to mean any material geologically in place and of a hardness when first exposed of three or greater in the scale of mineral hardness, which corresponds to the hardness of the transparent variety of calcite. Other materials shall not be classed as rock, although it may be more economical to remove the same by blasting.

Further clauses relating to rock are as follows:

No claim for an amount of money beyond the contract price of the work will be entertained or allowed on account of the character of the ground in which the trench or other excavations are made, except for the rock cutting heretofore specified.

An additional interesting feature of the specifications, relating to protection against water, is briefly expressed in the following words:

Where the excavation to its entire depth is in wet sand the contractor shall install a pumping system connected with well points so as to effectually drain the sand.

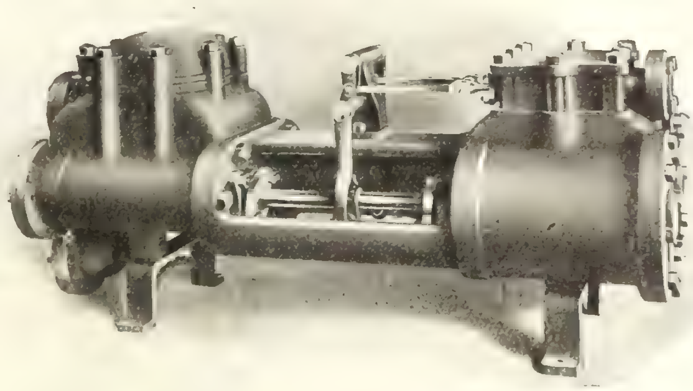
According to a recent dispatch from Vanvouver, 32 contracting firms of that city have signed an agreement to maintain only open shops.

E. F. Dartnell has recently booked the following order for the Shawinigan Water & Power Company's new power house, at Shawinigan Falls: 60,000 enamelled brick, 130,000 buff Kittanning vitrified brick, and $25,000 tapestry brick.

During the month of May the Montreal building inspector's office issued 429 permits for new buildings and 160 permits for alterations. The value of the alterations was estimated at $278,245, and the new work at $1,424,895, making a total of 589 permits with a valuation of $1,703,140. Last year, for the month of May, 329 permits were issued for new buildings and 124 for alterations. The value of the alterations was $128,585 and of the new work $1,580,615, making a total of 453 permits at an estimated value of $1,709,200.

BOILER FEED PUMPS

We have a large number of International Steam Pumps for boiler feeding purposes good up to 70 h.p. in stock ready for immediate shipment from our

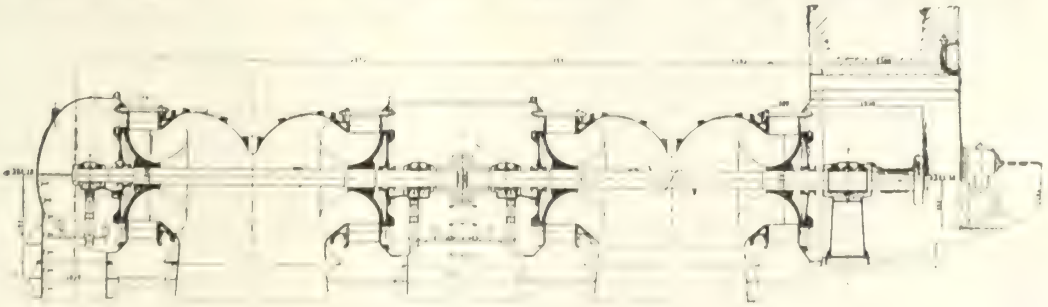


WORKS: 512 WILLIAM STREET, MONTREAL

THE JOHN McDOUGALL
CALEDONIAN IRON WORKS CO.
LIMITED

WATER-POWER PLANTS
LOW PRESSURE TURBINES

Any Output. 5,000 Turbines Supplied. 2,000,000 Horse Power.



26 ft. Head. 5,000 H. P.
Four Units as illustration on order for the German-Swiss Water Power Company

ESCHER WYSS & CO. - ZURICH, SWITZERLAND
CANADIAN HEAD OFFICE, 408 LUMSDEN BUILDING, TORONTO
PHONE, ADELAIDE 234

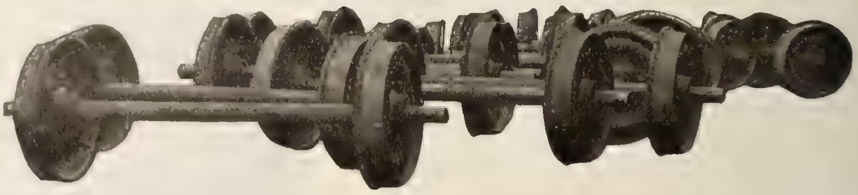
RAILWAY CONSTRUCTION PLANT

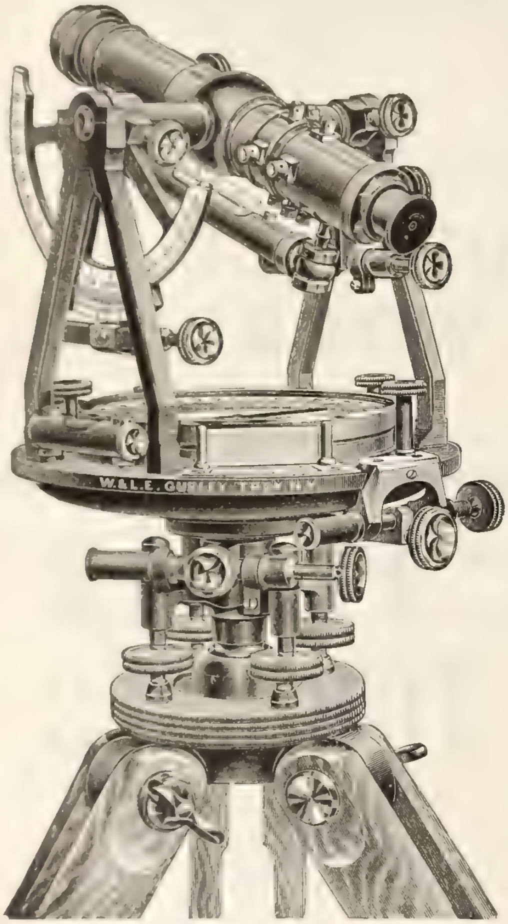
Hoisting Engines, Horse Powers, Hand Winches, Derricks, Car Wheels, Axles and Boxes, Dump Cars, Rail Cars, Buckets

MARSH & HENTHORN, Limited
Makers of Hoisting Machinery, BELLEVILLE, ONT.

Send for Catalogue

SALES AGENTS
MUSSENS
LIMITED
Montreal, Que.




W. & L. E. GURLEY TROY N.Y.

1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

Transits	Current Meters
Y Levels	Levelling Rods
Compasses	Chains
Plane Tables	Tape Lines

Also Makers of

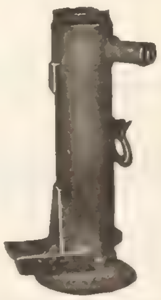
Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use



Made by practical Jack Builders. Material: best grades of malleable iron and steel. Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

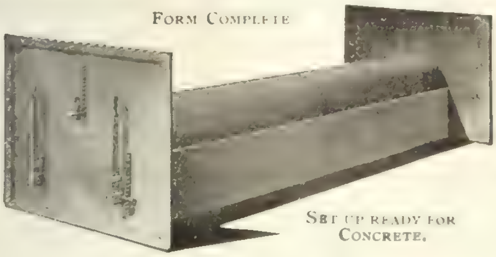
MANUFACTURED BY
H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.



Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

WRITE FOR FORM CATALOGUE
ENGINE CATALOGUE FOR THE ASKING
COMMISSIONER'S TIME BOOK FREE

Concrete Form & Engine Co.
Successor to Collapsible Steel Form Co.
83 Congress St. W., Detroit, Mich.

"The durability of a building is the gauge of its value from an economic standpoint."

—The Philosopher of Metal Town.

Absolute perfection in workmanship and quality of material used is the reason for the superiority of our

Corrugated Sheets

Only the best quality COLD ROLLED steel is used —a much tougher and finer material than the hot rolled article.

Each sheet is accurately squared and the corrugations PRESSED one at a time—not rolled—giving an exact fit without waste.

Specify our corrugated sheets and know that you are getting the best—the strongest and most durable on the market.

Flat or curved—galvanized or painted. Any size or gauge

Our special prices on car lots will interest you. Send for our new catalogue No. 70—it contains interesting information on Metallic Building Materials.

Manufacturers 1954

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

Bryan for Doors

We manufacture a line of high class doors for all parts of house finish. Our interior trim and fine interior hardwoods will give the building they are put into an artistic finish.

Send us your specifications for quotation

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario

Terra-Cotta Fireproofing

Get an Estimate from

ROBERT BENNETT
Contractor
347½ Euclid Avenue, Toronto

☞ Over 25 years experience in U. S. and Canada

PHONE COLLEGE 4362

TENDERS

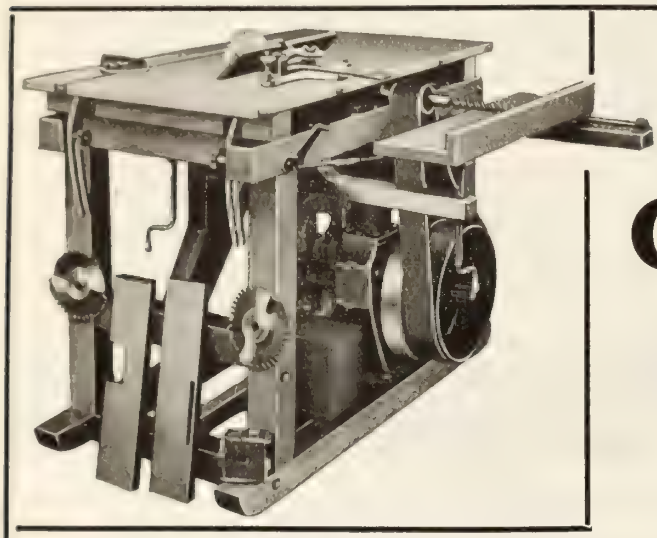
For Roofing and Sheet Metal Work

in all parts of Canada

Communicate with

A. Schwoerer & Sons, Inc.
530-34 E. 80th St. New York, N.Y.

Now working in Winnipeg, Regina, Vancouver, Montreal and Ottawa



On Every Concrete Job

You can save 10 to 15 per cent by using our Contractor's Portable Saw and Variety Woodworker.

Now is the time when you are starting to do your concrete work and this saw will be just what you are looking for—a cheap practical saw that will prove itself a time saver and money maker for you.

CONTRACTORS SUPPLIES OF ALL KINDS

The Canadian Fairbanks Co., Limited

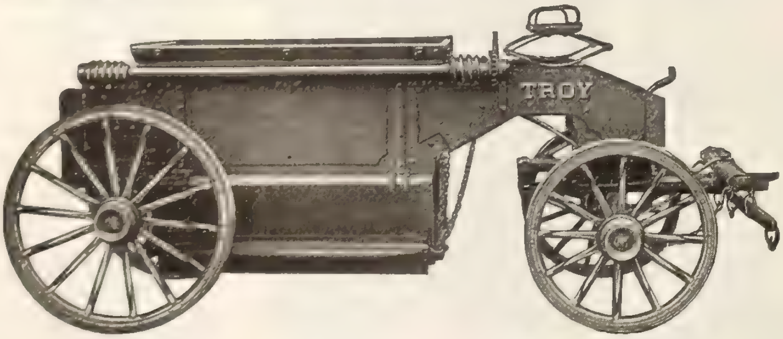
Fairbanks-Morse Gas Engines, Fairbanks Scales. Safes and Vaults.

Montreal Winnipeg Toronto Vancouver
St. John, N.B. Calgary Saskatoon Ottawa

WHAT IT IS

- A Rip Saw
- A Matcher
- A Mitre Saw
- A Cut-Off Saw
- A Dado Machine
- A Jointer
- A Boring Machine
- A Gaining Machine
- A Grooving Machine
- A Babbitting Machine
- A Moulder with Self-Contained Power

TIRED SHOVELERS CAN'T WORK FAST



Shoveling into a high dump wagon is an awful strain. It gets the best of the strongest man on these hot days

If you want your shovellers to work as fast at 4 p.m. as at 9 a.m., get TROY Specials. They are low down—the 1½ yd. size is only 4 ft. 8½ in. from ground to the top of box. At the same time, it's coupled short to make it easy running—only 8 ft. 4 in.

Look at any other low down wagon—see how long it is. Look at any other short wagon—see how high it is. Then get a price on the Special—you will like it too. Get Catalog 22.

The Troy Wagon Works Co.
South Main Street, Troy, Ohio

Producers of the Celebrated

"Peerless"
Bedford Stone

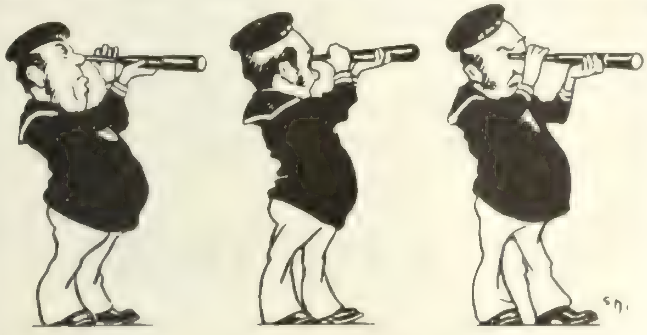
Bedford Indiana
Limestone

Mill Blocks
Sawed Planed and Turned Stone

W. McMILLAN & SON
(Incorporated)

General Offices
Chamber of Commerce Building
CHICAGO, ILL.

Quarries and Mills { Bedford, Ind.
Bloomington, Ind.



Looking for Business

Then our DAILY REPORT SERVICE will help you. Our organization provides the only systematic method yet devised for reporting Building and Engineering projects from their inception to completion.

Special facilities for gathering news of sales opportunities in machinery, equipment and materials required.

Ask us for further information. Let us send you rates and specimen reports.

MacLean Daily Reports
Limited

220 King St. West
TORONTO ONTARIO

More Mortar with

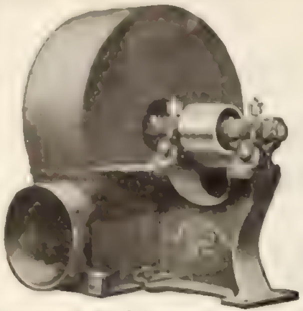
Renfrew Lime

That is why it will pay you to use it in place of some inferior brand. We have been established for twenty-five years, and are still growing, and why? Because 'RENFREW' LIME simply CAN'T BE BEATEN.

ALWAYS USE
'Renfrew' the Lime of Quality

Jamieson Lime Co.
RENFREW, ONTARIO

White Lime - Stone - Grey Lime
Brick - Drain Tile



Sturtevant
Stock Fans

Embrace such a diversity of types and **sizes that nearly any ordinary** conditions of fan engineering may be met by a fan shipped from stock.

Spare parts always ready for immediate shipment.

STURTEVANT Engineers suggest and recommend apparatus to meet requirements.

ASK THEM. 863

B. F. STURTEVANT, Hyde Park, Mass.

Polson Iron Works Ltd., Toronto Eadie-Douglas Ltd., Montreal

SHAWMUT VITRIFIED PAVING BRICK WORKS

SHAWMUT PA. **ALFRED YATES, GEN. MGR**

Vitrified Shale and Fire Clay
Paving Bricks and Blocks

Burned in Yates' Patent Kiln

Samples and Prices on Application

Summer Home Britannia Heights, near Ottawa, Canada. Architect, "Bungalow Craft", Los Angles, Calif. Frontage, 38 feet, depth 38 feet. Cost Complete—$5,400.

This is the kind of work you can do with

"IDEAL" FACE DOWN CONCRETE BLOCK MACHINES

Architects and Engineers are specifying Concrete Blocks in place of Brick and stone.

Builders, who operate their own "IDEAL" Machines, not only get the contracts, but are in a position to guarantee promptness and make an excellent profit on materials.

Let us send you complete catalogues, showing styles of machines and the complete line of Facings, Lintels, Sills etc.

Reliable and Energetic Agents wanted in every Locality

IDEAL CONCRETE MACHINERY CO., LIMITED.
Dept. B., LONDON, ONTARIO

Armstrong
CRANES

Built for Every Service
up to 75 tons capacity

Electric Traveling Cranes, Standard
Electric Traveling Cranes, Special
Electric Gantry Cranes
Electric Jib Cranes
Hand Operated Cranes
Locomotive Cranes
Hydraulic Cranes

H. J. ARMSTRONG
Engineer and Manufacturer
Markdale, Ont., Can.

Fred Holmes, President C. P. Holmes, Sec'y-Treas.

Telephone North 663

Fred Holmes & Sons
Limited
Building Contractors

1113 Yonge St., Toronto

The Carey Roof Standard
CAREY'S FLEXIBLE CEMENT ROOFING

TO PROVE TO YOU the high, standardized construction and composition of Carey's Roofing, we want to send you BOOKLET AND SAMPLE FREE, and give you practical information regarding Carey's Roofing based on 25 years' actual time-proved tests Carey's Roofing is equally adapted to flat or steep surfaces, wood sheathing, tile or concrete. Whether your contract is large or small, we want to show you the advantage of using a standardized roofing material. THE PHILIP CAREY MFG. CO., 60 Wayne Ave. Cincinnati, O. 50 Branches.

"FAMOUS FOR DURABILITY"

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 1000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

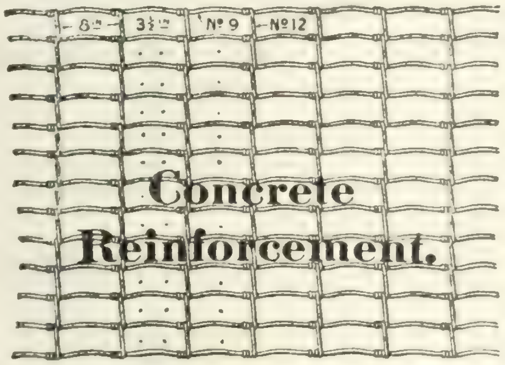
Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Concrete Reinforcement

In 3½ ft. Rolled Units

Page Concrete Reinforcement with a 3½ x 8 mesh, and running wires of 2,200 lb. tensile strength is used on the Harbour Commission Elevator, Montreal, Soulanges Canal, etc. It replaced on the Chambly Dam reconstruction on the Richelieu, a reinforcing that failed, although of large reputaton. This is proof of its quality. It really reinforces concrete work under heavy stresses.

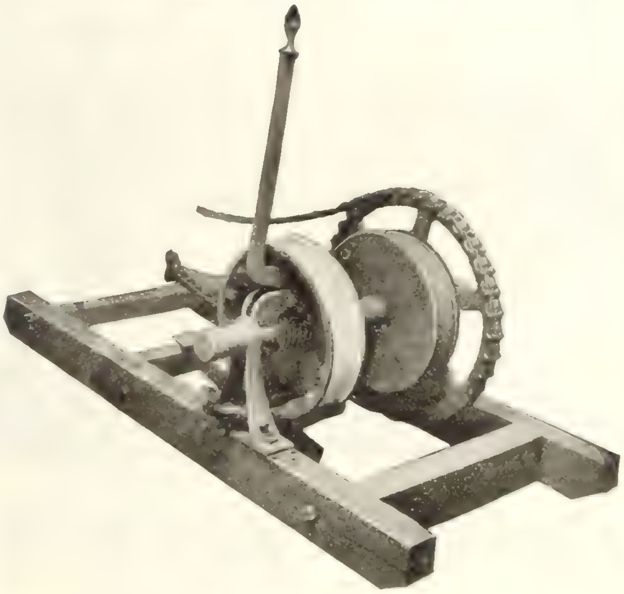


Put up in rolls for easy transportation. Running wires of high carbon steel, not bent or kinked, and of full strength. For adaptable and safe reinforcing of concrete, in dam, retaining wall, and bridge work, factory and foundation work, etc.

PARTICULARS, QUOTATIONS AND SAMPLE ON REQUEST.

Page Wire Fence Company, Limited
Walkerville, Ont.
Toronto Montreal St. John

DO YOU WANT A GOOD HOIST?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work **Mortar Conveying** **Well Digging**
Bridge Building **Sewer Building** **Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists **London, Canada**

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President
Thos. C. Irving Jr., Vice-Pres.
Jas. W. Moffat, Secretary
Chas. Warnock, Treas. & Man.

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, Canadian [illegible] Bldg., Montreal, Que.
Branch Offices: Traders Bank Building, Toronto, Ont.
Norfolk House, Laurence Pountney Hill, London, Eng.

Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's New Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

for concrete reinforcement is made from high carbon, cold drawn wire. The process of cold drawing eliminates the possibility of flaws. Perfection Wire Mesh is necessarily perfect.

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

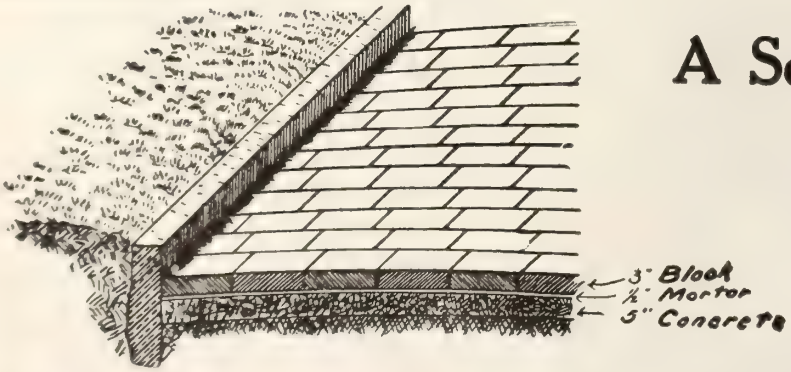
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

for Highest Efficiency, Absolute Reliability, Greatest Economy

Used by the Largest Mining Companies and Hydro-Electric Plants.
Also Extensively for Dredging, Exhaust Steam, Compressed Air, etc.

Sizes 3 to 42″ Diameter up to ¼″ in thickness
Easily installed and securely connected with our Forged Steel Flanges or All Steel Bolted Joints.

Write for our Catalogue A and prices on your requirements

AMERICAN SPIRAL PIPE WORKS - MAIN OFFICE—CHICAGO
NEW YORK OFFICE—50 Church Street

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)
"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."
W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.
1032 Garfield Building, CLEVELAND, OHIO
SELLING AGENTS
The Dominion Equipment & Supply Co., Winnipeg, Canada

Strengthen Your Concrete

BY USING

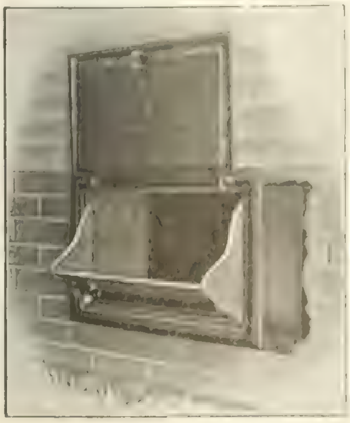
Guelph Hydrated Lime

The engineer who is dealing with concrete construction can greatly strengthen his job by using **Guelph Hydrated Lime.**

It makes the work Waterproof, and a better color.

Specify **Guelph Hydrated Lime** and insist on your dealer supplying it.

Standard White Lime Co.
Guelph - Ontario



EQUIP YOUR CELLAR

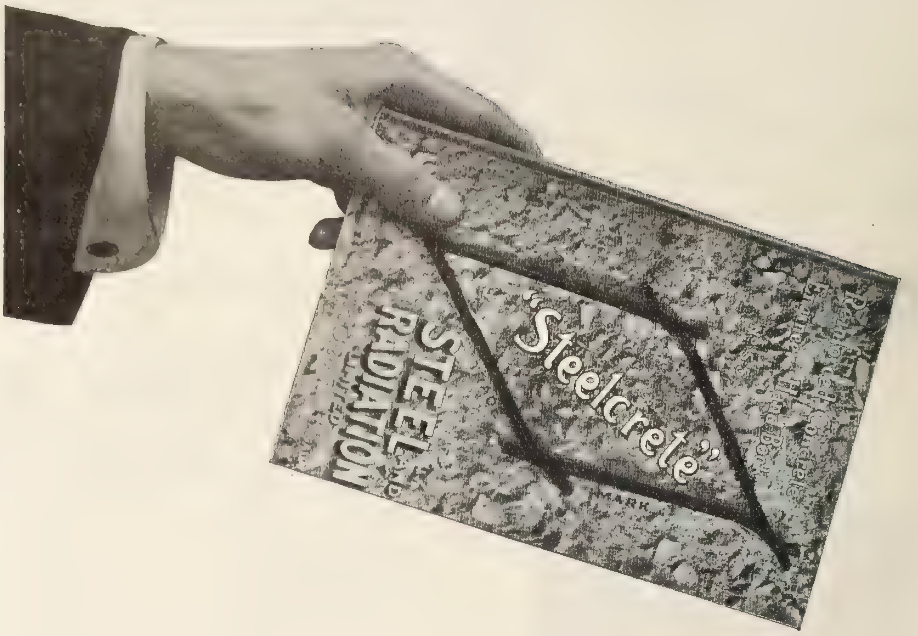
with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

Send for our illustrated booklet, [illegible]

The Down Draft Furnace Co., Limited
Galt, Ontario, Can.

Steelcrete TRADE MARK

Steelcrete TRADE MARK



This Book Free to

Builders, Architects, Engineers

Every man interested in the designing or building of Re-inforced Concrete of any kind should have a copy of this latest Hand-Book of ours.

It tells briefly, and without a confusing mass of technicalities, of the latest wrinkles in Re-inforced Concrete Beams, Floors, Roofs, Bridges, Culverts, Retaining Walls and Dams.

It also describes with profuse illustrations the construction of Fire-proof Partitions, Ceiling and Exterior Walls with re-inforced cementine or stucco.

If your copy sent to those on our mailing list, has not yet reached you, drop us a card for another.

Don't fail to consult us about any of
your Re-inforced Concrete problems

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE—FRASER AVENUE

MONTREAL
138 CRAIG STREET WEST

Steelcrete TRADE MARK

Halifax—Room 13 Keith Bldg.
St. John—13 Germain St.
Quebec—153 St Paul St.
Ottawa—83 Banks St.

Fort William—113 N. May St.
Winnipeg—331 Garry St.
Calgary—309-8th Avenue.
Vancouver—416 Pacific Bldg.

Steelcrete TRADE MARK

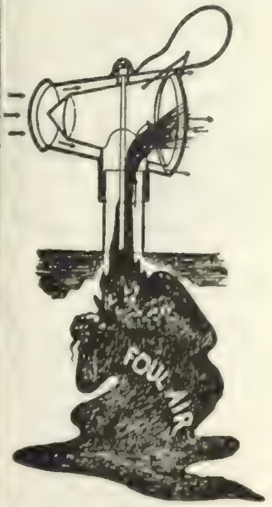
IRON STAIRS

Dennis Wire & Iron Works Co.
London, Canada Limited
Toronto Offices - 12 QUEEN STREET E.

Cut shows a four wheel steam Locomotive Crane with 40ft. boom handling forms on New York Catskill Aqueduct at Valhalla, N.Y These contractors are finding our cranes indispensable in this work, as they can be used for so many purposes; such as handling loose materials as broken stone, sand, concrete, etc., heavy timbers, rails, concrete forms, etc.

THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND, OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City

AUTOFORCE VENTILATING SYSTEM



(Patented)
toforce Air Pump Ventilator

Write us for full Particulars

PURE AIR

Positively No Down Draft

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

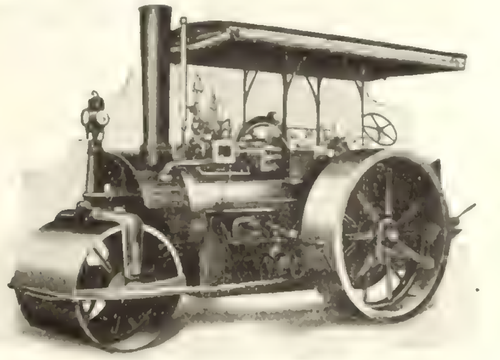
Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

Sole Licensees and Manufacturers for Canada

Gardiner & Gaskill, 505 Power Bldg. Montreal, Que.
Telephone Main 159

"A Canadian Roller for Canadian Roads"



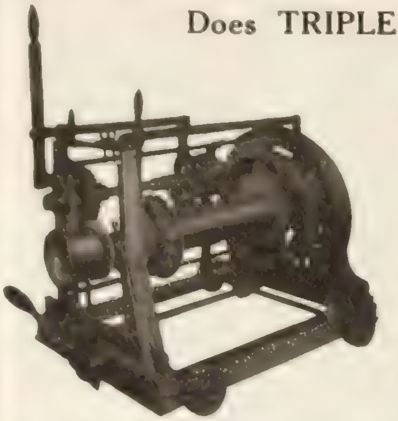
THE WATEROUS
DOUBLE CYLINDER
STEAM ROLLER

is built essentially to suit Canadian road building conditions. Over 100 Rollers in use in Canada to-day are proving their ability as road makers of the highest quality. A greater rolling capacity, with less cost of maintenance and operation, are its distinguishing characteristics. [illegible]

The Waterous Engine Works Co.
BRANTFORD, CANADA Limited
Agent: Hugh Cameron & Co., 72 Queen St. E., Toronto, Ont.

The Parker Reversible Friction Hoist

Does TRIPLE Duty



Run with Gasoline Engine or Motor

No Experienced Operator Required

Drum, Elevator Sheave, Winch head all operate independently of each other, and are each reversible. This hoist operates a derrick from the drum, a double cage material elevator from the sheave, and serves various other purposes from the winch head all on one job.

PAYS FOR ITSELF ON ONE ORDINARY JOB.

"I have used your No. 100 Reversible Hoist for over 5 years. It runs like a clock and has cost me nothing for repairs."

From an Experienced Contractor.

We also build derricks, steam and electric hoists in all sizes. Sole manufacturers of the PARKER PATENTED DERRICKS.

Write for information and prices.

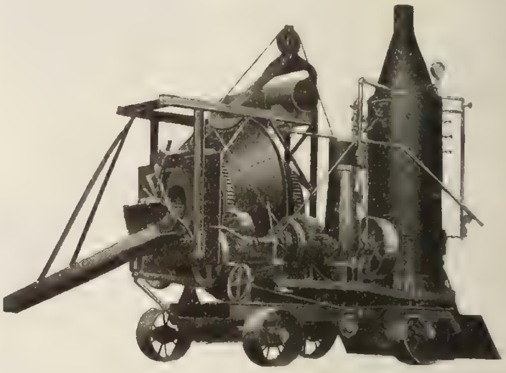
S. E. PARKER, 1800-2 N. Francisco Ave., Chicago, Ill.

Selling Agents:

Gorman, Clancey & Grindley, Calgary and Edmonton, Alta.
J. L. Stuart Machinery Co., Winnipeg, Man.
A. G. Langley & Co., Vancouver, B.C.

The Foote Concrete Mixer

Superior in every feature that goes to make up a good Concrete Mixer.



with Gravity Distributing Chute

The General Machinery Co., Ltd.
526-7 Traders Bank Building
TORONTO, ONT.

Established 1882

THE COMMERCIAL

The Weekly Financial, Commercial & General Trade Newspaper of the Great West.

Winnipeg, Manitoba

JAMES BRODIE & CO.

Quarriers and Manufacturers of

Canadian Quinsy, Ebony and Stanstead Granite

Monumental Building, Curbing, Paving, etc. Rough Stock a Specialty

IBERVILLE, QUE.

ESTABLISHED 1849.

BRADSTREET'S

Offices Throughout the Civilized World.

Executive Office :
Nos. 346 and 348 Broadway, NEW YORK CITY U.S.A.

THE BRADSTREET COMPANY gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing and manufacturing concerns, and by responsible and worthy financial, judiciary and business corporations. Specific terms may be obtained by addressing the company or any of its offices. Correspondence invited.

THE BRADSTREET COMPANY.

OFFICES IN CANADA: Halifax, N.S.; Hamilton, Ont., London, Ont.; Montreal, Que.; Ottawa, Ont.; Quebec, Que.; St. John, N.B.; Toronto, Ont.; Vancouver, B.C.; Winnipeg, Man.; Calgary, Alta.; Edmonton, Alta.

THOS. C. IRVING,
Gen. Man. Western Canada, Toronto

Geo. M. Miller & Co.

Architects

Toronto General Trust Building TORONTO

Power & Son,

Architects and Building Surveyors

Merchants Bank Chambers,
Kingston, Canada

Taylor, Hogle & Davis

(Taylor & Gordon,)

Architects

North British & Mercantile Chambers
80 St. Francois Xavier St., Montreal
Telephone Main 281

TENTS

for Engineers and Contractors

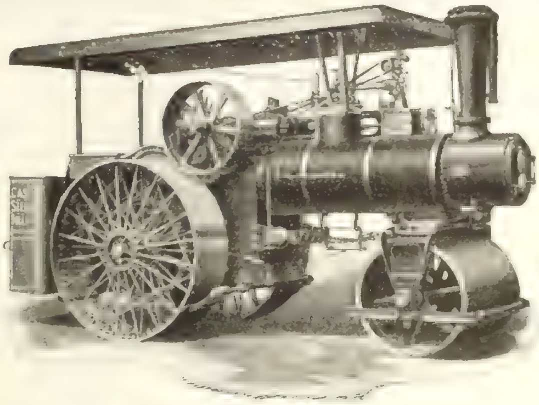
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

Woods Limited
Woods Building - Ottawa, Ont.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT

THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18" x 26" cylinder Mogul, Standard Gauge, and 18-10" x 14" Vulcan and Davenport dinkeys, 36" Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36" Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8" Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	-Drag-Scrapers an 4—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36" Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW

May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. and Dolland Lane - - MONTREAL, CANADA

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A.

Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

A solid woven textile belt, impregnated to resist moisture.
We guarantee this belt on any straight or crossed drives against any belting made.
It is equally good in WET or DRY places.
It is not made in plies and cannot come apart.

Inquiries solicited.

THE
Thames Quarry Co.
St. Mary's, Ont.
CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

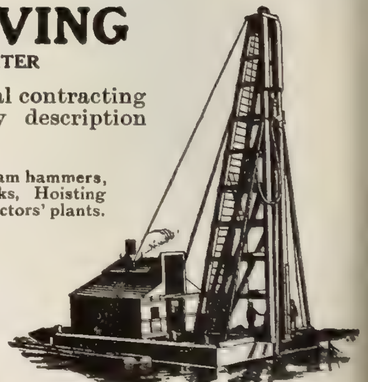
JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.



The

Missisquoi Marble Company

Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd.	Toronto, Ont.
C. N. Barclay	Winnipeg Man.
Bosse & Banks	Quebec, Que.
General Contractors Supply Company, Ltd.	Halifax, N. S.
129 Sparks Street	Ottawa, Ont.
James Robertson Co. Ltd.	St. John, N. B.
G. R. Duncan	Fort William, Ont.
Walker & Barnes	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd.	Vancouver, B. C.
315 Coristine Building	Montreal, Que.

Perfect Castings

can be obtained only when a practically perfect fire brick is used

GLENBOIG

Every Glenboig Brick bears the brand

GARTCOSH

GLENBOIG

represent the highest degreé of perfection in a fire-brick yet produced. To quote a famous english engineer. "Every improvement you make in the quality of your fire-bricks makes possible another advance in the practical science of metallurgy."

Our literature will interest.

MAKER'S SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another.

Tide Water Iron Works

HOBOKEN, N.J. U.S.A.

Everything for the Builder

At the Right Price

Interior Trim

Mouldings

Turnings

Stair Building

Lumber

Lath

Shingles

Sash

Veneer Doors

Pine Doors

Frames

"Empire Brand" Hardwood Flooring

LET US QUOTE YOU

J. R. Eaton & Sons

Limited

Orillia, Ontario

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North 604 / 605 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C.P.R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

RECIPROCITY

means to exchange. We have high quality fittings, you have good money. Lets get together.

S BRAND

Cast Iron Fittings and Valves are Right

"Everlasting" Blow-off Valve
SIMPLE — DURABLE — EFFICIENT

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

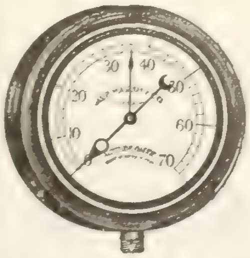
Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

MARSH GAUGES



FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES

(Installed in Toronto).

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite, 55 cents per square foot.

Viterous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¼ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

PAINTS AND OILS

(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

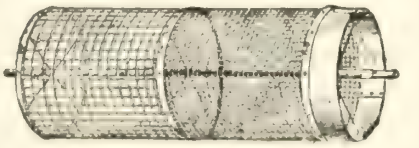
Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, 8cc per gallon.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

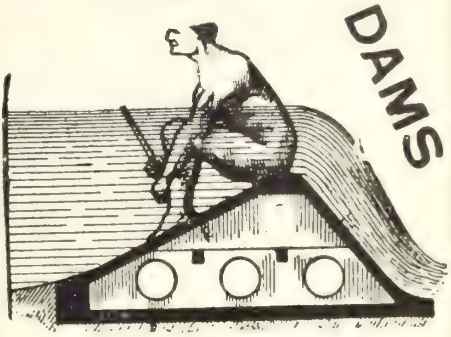
We manufacture
Revolving Screens



and anything in the screen line.
Also railings, wire guards, grills etc.
Electro-plating and all metal finishes.
Estimates Given - Send for Catalogue
Crescent Wire & Iron Works
Partridge & Sons KINGSTON

Bonds of Suretyship for Officers and Employees in positions of trust.
Bonds Bid and Supply in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies.
The
Guarantee Company of North America
[illegible]
Head Office - Montreal
Capital and Resources over $1 965,000
Claims Paid over - - - $2 265,000
No Claims in Dispute
This Company is not a party to any premium tariff combination

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting Contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS
General Manager.
Head Office:
INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

BUILDERS SUPPLIES

WATER WASHED SAND

OUR SPECIALTY

Dealers in
Sand and Gravel
Crushed Granite
Crushed Stone

SAND
&
SUPPLIES, LTD.
TORONTO

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

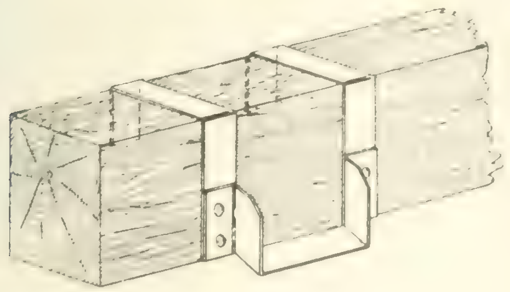
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

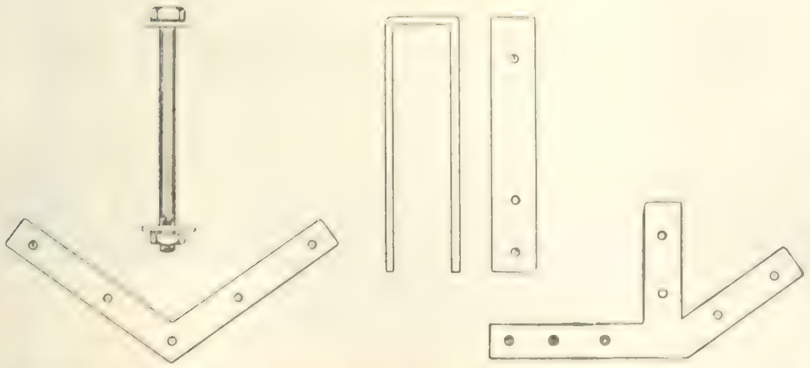
Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company, Ltd.

HAMILTON, ONT.



STEEL JOIST HANGERS, Single or Double



IRON FORGINGS, for Wooden Trusses, Apex Straps, Stirrups, Bolts and Rods madeto order

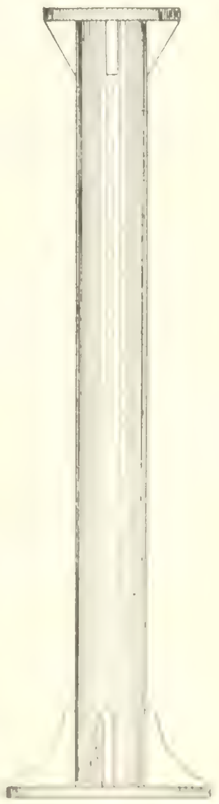
Beams,

Angles,

Channels,

Plates,

Any Size from 1½ inch to 24 inches, and any length up to 70 feet.



CAST IRON COLUMNS
all sizes and designs

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President. J. G. Allan Vice-President. James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canda

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridge's Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS

CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street East, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.

A.M. Can. Soc. C.E. A.M. Am. Soc. C.E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 413, Pacific Block, Vancouver, B. C.

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Winnipeg and Calgary

John Haddin E. L. Miles

Allan Keefer

Architect

Ottawa, Ontario

Arthur L. Weeks

Architect

Canada Life Building, Ottawa

Reinforced concrete and steel structures, factories and commercial buildings

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes. "Roman" building stone. "Milton" pressed bricks. Sanitary flooring, stone crushers, fire engines, &c.

T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g. 224 St. James St. Montreal

Bell Tel. M. 4354

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

THE FOUNDATION COMPANY

LIMITED

Bank of Ottawa Building - Montreal, Canada

WE MAKE A SPECIALTY OF

Water Power Construction
Power Plants, Dams

WITH A LARGE EQUIPMENT OF **PLANT** AND A WELL-ORGANIZED **FORCE** WE ARE PREPARED AT ALL TIMES TO UNDERTAKE DIFFICULT WORK ON THE SHORTEST NOTICE

Our Scope

BRIDGE PIERS — DOCKS — DAMS — SEA WALLS — MINING SHAFTS
WHARFS—TUNNELS—WATER POWER CONSTRUCTION
HEAVY BUILDING FOUNDATIONS

Our Methods

PNEUMATIC CAISSONS — OPEN CAISSONS — WOODEN AND STEEL
SHEET PILING — CONCRETE PILES — WOODEN PILES
COFFER DAMS—CONCRETE STEEL CONSTRUCTION

We Invite Inquiries in Reference to Cost and Design of Difficult Foundation Work.

Barrett Specification Roofs

Main Works of
American Optical Company, Southbridge, Mass.

No Maintenance Expense

THE most economical way to roof a building is to put on a *good* slag or gravel roof. The way to really get a roof of this character is to *insist* that your roofer lay same strictly "according to The Barrett Specification," *using the materials specified.*

This specification is the standard method for using coal tar pitch, tarred felt and slag or gravel to make a roof which will give *maximum* service.

It completely removes all *uncertainties.*

The owner has a definite, practical specification on which he can invite competitive bidding with absolute certainty of getting uniform quality, workmanship and results, provided a reputable contractor is employed.

A Barrett Specification Roof is inexpensive. Such roofs give upwards of 20 years of service. They need no painting or other maintenance expense.

The net result of low first cost and no maintenance is a *low unit cost* per square foot per year of service which is below that of any other roof covering known.

A copy of The Barrett Specification sent free on request.

The Paterson Manufacturing Co., Limited

Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S.

THOS. & WM. SMITH, LD.,
WIRE ROPE MANUFACTURERS,
NEWCASTLE-ON-TYNE, ENGLAND.

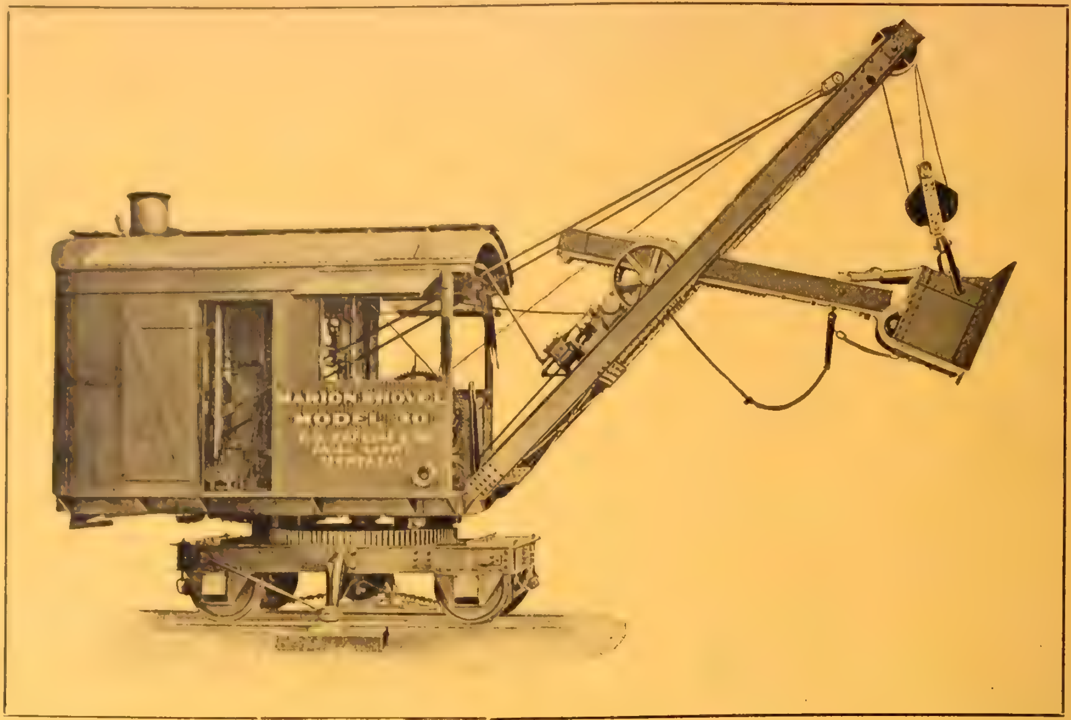
ELECTRIC CABLEWAY OVER THE ZAMBESI RIVER AT THE VICTORIA FALLS.
Span, 870 feet. Working Load 10 tons. Main Cable [illegible] Breaking Stress of Main Cable 275 tons.
Main Cable supplied by Thos. & Wm. Smith Ltd., Newcastle-on-Tyne

HIGH-CLASS WIRE ROPES
For CONTRACTORS' WORK, such as BLONDINS, CRANES, INCLINES, BALLAST ROPES, &c., &c., and all classes of work requiring Wire Ropes.

AGENTS IN CANADA
EVANS, COLEMAN & EVANS, Ltd., Vancouver. ANGEL ENGINEERING & SUPPLY CO. Ltd., St. John's, N.F.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg. BAINES & PECKOVER, Toronto.

REPRESENTATIVE FOR CANADA
D. W. CLARK, P.O. Box 521 TORONTO, ONTARIO.

USE ONLY SMITH'S "RED THREAD" WIRE ROPES.



"MARION"

Revolving Steam Shovels

Especially designed for

BRICK YARDS
ORE DOCKS
THOROUGH-CUT WORK
CONTRACTORS USE IN
ROAD WORK
CELLAR EXCAVATING
LOADING COAL
Any similar operation where it is desired to deposit material within full circle swing.

Supplied with

½—⅝—¾—1¼ cubic yard Dippers

"MARION" Revolving Shovels are the most extensively used revolving shovels there are on the market today, which is abundant proof of their superiority in design, construction workmanship and efficiency over other makes of this type of shovel. Operated by one man. Supplied with Traction Wheels if desired.

Let us send you catalogue

F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man. and Vancouver, B.C.

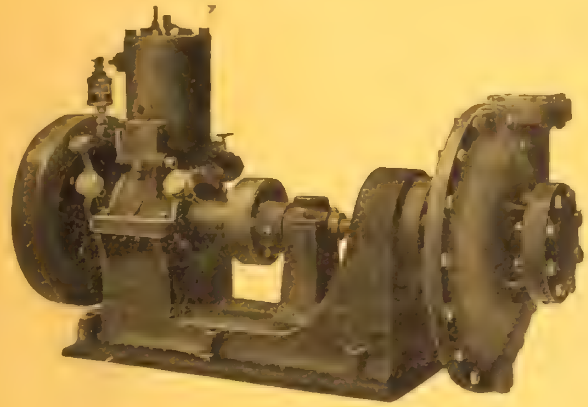
Vol. 25 Toronto, July 5, 1911 No. 27

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

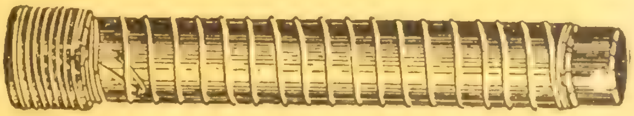
We manufacture Steam and Power Pumps, Condensers, Travelling Cranes, etc.
Write for Catalogue



The Smart-Turner Machine Company Limited
HAMILTON, ONTARIO

"MADE IN CANADA"
Bent Glass
Made in all Kinds of Glass on Short Notice
Large Bent Plate Glass for Shop Fronts a Specialty
The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: 91 to 133 Don Roadway
TORONTO

Saves Labor
"FLEUR DE LIS"
FLEUR DE LIS
Galvanized Iron
Lies flat and works up easily, thereby saving your worker's time.
John Lysaght, Limited
Makers
Bristol, Newport
A. C. Leslie & Co., Limited
MONTREAL
Managers, Canadian Branch



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS
for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.
Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

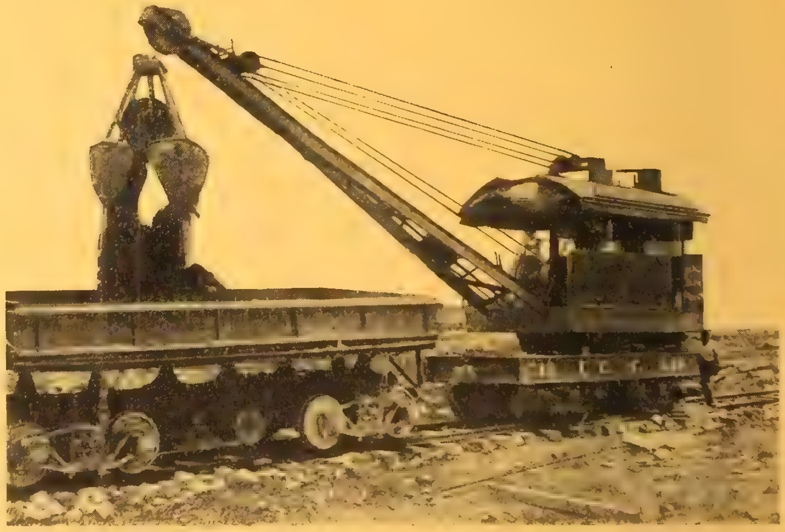
Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

---

THE "AMERICAN" IS THE ONLY LOCOMOTIVE CRANE

in which the Four Motions of Traveling, Hoisting, Slewing and Raising and Lowering of Boom are absolutely independent of each other.



One man operates it

Catalog No. 7 describes it

American Hoist & Derrick Company

St. Paul, Minn., U. S. A.

Gorman, Clancey & Grindley	Edmonton and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot, Ltd.	Vancouver, B.C.
J. L. Neilson & Co.	Winnipeg, Man.
Dunn Brothers	Winnipeg, Man.
J. A. McTaggert	Winnipeg, Man.

Name __________

Address __________

Please send prices and information
on "AMERICAN" Equipment. State
whether Engines, Derricks, etc.
AMERICAN HOIST
& DERRICK CO.
St. Paul, Minn.
C.R. 7/5/11

When making specifications keep these facts in mind about Canada Cement

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

Remember

We guarantee **uniformity of strength, setting qualities, color,** and **fineness of grinding,** which must obtain if Concrete construction is to prove successful.

CANADA CEMENT COMPANY LIMITED
PORTLAND
CANADA
CEMENT
MONTREAL

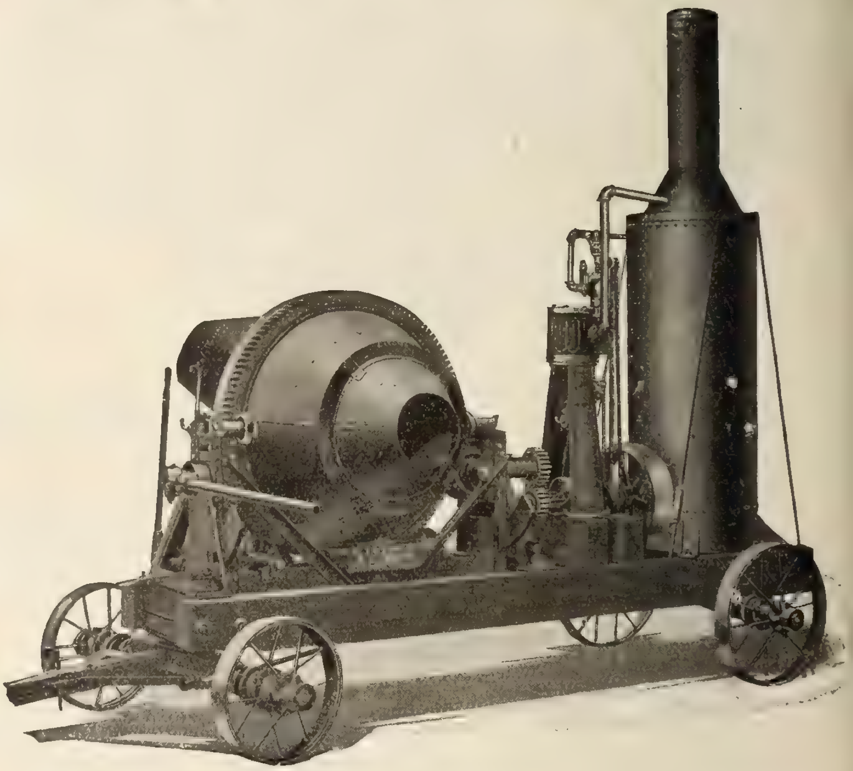
Canada Cement Company, Ltd.

MONTREAL - TORONTO - WINNIPEG - CALGARY

You Can't Help Feeling Satisfied

IF YOU USE A

Smith Mixer



YOU WILL HAVE

Peace of mind and money in the bank because Smith Mixers are

NEVER IDLE
NEVER QUIT
NEVER FAIL

WE HAVE THEM IN 4 SIZES AND ALL STYLES

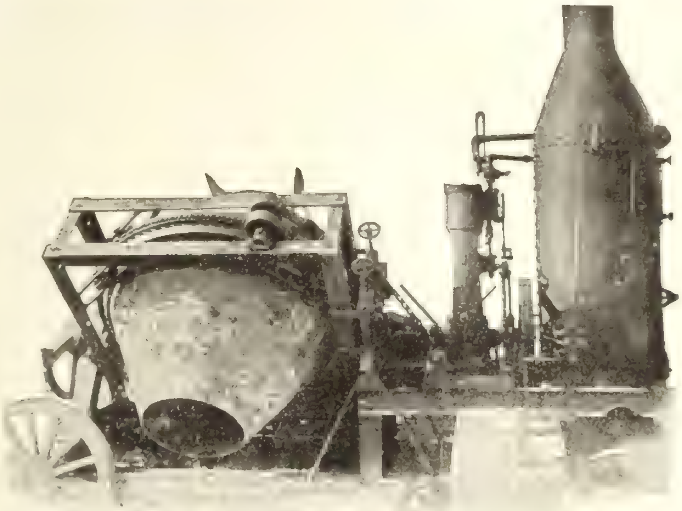
Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

Durability and Lasting Qualities

Here is a picture of the

IRST SMITH MIXER



hich worked for 10 years before
was retired. During all that
me there was only a compar-
tively small repair bill.

Today we are turning them out

Better than ever

What's the answer?

Buy a Smith Mixer

We also have a Complete Line of Concrete Equipment — Cars, Carts, Spreaders, Elevators, Barrows, Etc.

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects — Page
[illegible] 88
[illegible] 88

Architectural Iron Work
[illegible] Wire [illegible] Mfg. Co [illegible]
[illegible] Wire & Iron Works [illegible]
[illegible]

Air Compressors
[illegible]

Air Valves Automatic
Marsh, J. P. 82

Asphalt Plant
[illegible] 73

Buckets
American Hoist & Derrick Co 2
[illegible] Screen & Shute Co

Belting
[illegible] Engineering & Supplies, Ltd 80

Blowers
Sturtevant Co., B. F 72

Boilers
Case Threshing Machine Co 79
Inglis, John 65
Jenckes Machine Co. 2
Leonard & Sons, E 73
Marsh & Henthorn 68
McDougall Caledonian Iron Works 67
Mussens Limited 4
Waterous Engine Works Co. 77

Brick Machinery and Supplies
Berg Mfg. Co.
[illegible] C. S
Whitehead, John 29

Brick
American Enamelled Brick Co. 78
Don Valley Brick Works 7
Hamilton Pressed Brick Co
Milton Pressed Brick Co 27
Port Credit Pressed Brick Co 86
Toronto Pressed Brick Co.

Brickmaker's Supplies
[illegible] Screen & Shute Co.

Bridges (Steel)
[illegible] Bridge Co
Canadian Bridge Co 84
Cleveland Bridge Co 84
Dickson Bridge Works 78
Dominion Bridge Co 84
[illegible] Bridge and Boiler Works 30
Phoenix Bridge and Iron Works 85
Pennsylvania Steel Co. 84

Cement
Alsen Portland Cement Co 74
Britnell & Co 80
Bremner, Alex 87
Canada Cement Co 3
McNally & Co., W. 85
Morrison & Co., T.A. 88
Rogers, Alfred Limited 9

Concrete Pipe
Dominion Concrete Co. 22
[illegible] Pipe Co 33

Cement Waterproofing
[illegible] 55
Hercules Waterproofing Cement Co
Mansbendel, F. P. 31

Cranes, Travelling & Locomotive — Page
American Hoist & Derrick Co. 2
Armstrong, H. J. [illegible]
Brown Hoisting Machinery Co. 77
Males Co 64
Willis Shaw Machinery Co 64

Conduits
Conduits Co., Limited 87

Crushed Stone and Granite
Sand and Supplies 85

Concrete Mixers and Machinery
Canada Foundry Co. 20
Cropp Concrete Machinery Co. 80
General Machinery Co. 78
Gould, Shapley & Muir 16
Hopkins & Co., F., H 92
Ideal Concrete Machinery Co. 72
Jenckes Machine Co 2
London Concrete Machinery Co. 35
Milwaukee Mixer Co. 16
Mussens Limited 4
Morrison & Co., T.A 88
Steel and Radiation (Cement Gun) 76
Standard Scale 70
Vining Bros 68
Wettlaufer Bros. 10

Contractors' Plant
American Hoist & Derrick Co. 2
Acme Eqpt. & Engineering Co. 75
Beatty & Sons, M. 6
Hepburn, John T 12
H. & E. Lifting Jack Co.
Hopkins & Co., F.H 92
International Marine Signal Co. 8
Willis Shaw Machinery Co. 64
Meaford Wheelbarrow Co. 27
Marsh & Henthorn 68
Montreal Locomotive Works 32
Mussens Limited 4
Ritchie Contractors Supply Co.
Tiffin Wagon Co. 78
Troy Wagon Works 79
Watson Wagon Co

Crushers (Stone and Rock)
Berg Machinery Co
Case Threshing Machine Co. 79
Hopkins & Co., F. H. 92
Jenckes Machine Co 2
London Concrete Machinery Co. 33
Males Co 64
Mussens Limited 4
Morrison & Co., T. A 88
Willis Shaw Machinery Co 64

Corrugated Iron
Galt Art Metal Co
Metallic Roofing Co 69
Metal Shingle and Siding Co
Ormsby, A. B., Limited 11
Roofers Supply Co 87

Contractors
Bennett, Robt.
Foundation Co
Holmes, Fred.
McIlwraith, Jas. A 88
Nadel & Adler 88
Wells & Gray

Coal Handling Apparatus
American Hoist & Derrick Co 2
Down Draft Furnace Co. 75

Derricks and Derrick Fittings
American Hoist & Derrick Co 2

Drills
Beatty & Sons M 6
Canadian Rand Co

Drilling Contractors — Page
Harvey, J. 89

Dredges
Beatty & Sons, M 6
Males Co 64
Willis Shaw Machinery Co 64

Dry Kilns
Sturtevant Co., B. F. 72

Electrical Apparatus, Motors
Canada Ford Co. 36

Engines
Case Threshing Machine Co. 79
Canadian Boving Co. 29
Inglis, John 65
Jenckes Machine Co 2
Leonard & Sons, E 73
Mussens Limited 4
Sturtevant Co., B. F 72
Waterous Engine Works Co 77

Engineers (Civil) and Mechanical
Barber & Young 88
Chipman & Power 88
Bowman & Connor 88
Farmer, John T 88
Fuce, Edw. O 88
Galt Engineering Co., John 88
Glaubitz, H. J 88
Hancock, H. Syd 88
Inglis, John 65
Kennedy, Jas. C. 88
Lea & Ferguson 88
Mace, T. Harry 88
Mitchell, C. H 88
McRae, John B 88
Moore & Scollan 88
Taylor, James 88

Exhaust Heads
Sturtevant Co., B. F 72

Filters
American Water Softener Co

Floor Scrapers
Hurley Machine Co 30

Friction Clutches
Berg Machinery Co

Field Instruments
Gurley, W. & L. E 68

Fire Brick
Gibb, Alexander 81

Fire Apparatus
Morrison & Co T. A 88
Seagrave, W E 80

Fireproof Doors and Windows
Douglas Bros 18
Mussens Limited 4
Ormsby, A. B 11
Steel and Radiation 80

Gauges, Steam, etc.
Marsh, Jas. P 82

Granite and Marble
Laurentian Granite Co 83
Missisquoi Marble Co 81
Smith Marble & Construction Co. 69

Glass — Page
Consolidated Plate Glass Co.
Luxfer Prism Co 91
Toronto Plate Glass Importing Co. 1

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E 73
Steel and Radiation 76

Hoisting Machinery
American Hoist & Derrick Co. 2
Beatty & Sons, M 6
Canada Ford Co. 36
Inglis, John 65
Jenckes Machine Co 2
Hopkins & Co., F. H 92
London Gas Power Co 73
Marsh & Henthorn 68
Mussens Limited 4
Parker, S. E. 78
Sturtevant Co., B F 72

High Pressure Pipe Lines
Escher Wyss & Co

Hydrants
Canada Iron Corporation 87
Gartshore-Thomson Pipe Co 86
Kerr Engine Co 28

Interior Finish and Doors
Anglin, S. 74
Brennen & Sons, M 25
Batts Limited
Canada Office & School Furniture Co
DeLaplante, Ltd. 81
Bryan Mfg. Co 67
Eaton & Sons, J. R. 81
Georgian Bay Shook Mills
Rhodes Curry & Co. 71
Tillson Co. 19
Wilson Bros. 26

Locomotives
Montreal Locomotive Works 32

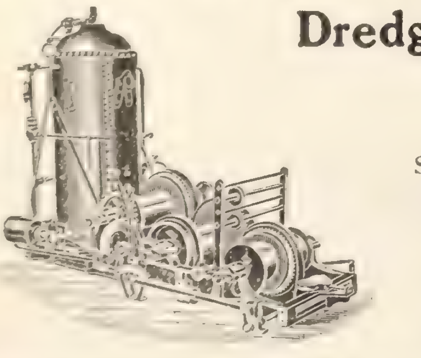
Lime
Christie, Henderson & Co. 82
Jamieson Lime Co 71
Standard White Lime Co 75

Metal Lath
Galt Art Metal
Metallic Roofing Co. 69
Noble C. W. 74
Steel and Radiation 78

Meters
Hopkins & Co., F. H. 92
McDougall Caledonian Iron Works 67
Neptune Meter Co 71

Paving and Paving Materials
Dominion Carbolineum Works 17
Metropolitan Paving Brick Co.
Ontario Asphalt Block Co. 74
Shawmut Paving Brick Co. 72
Silica Barytic Stone Co. of Ontario 83

(Continued on page 10)



M. Beatty & Sons, Limited
Welland, Ontario, Canada

Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows
Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

SIMPLE PERFECT

CLEAN WATER

For MANUFACTURERS or MUNICIPALITIES

Can be obtained by using the

"TORRENT" or "PULSOMETER"

FILTER

Complete information furnished on request

International Marine Signal Company Limited

OTTAWA, CANADA

GRAVITY PRESSURE

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Page
[illegible] Mfg. Co.	
[illegible] & Co.	82
[illegible], H. W.	86

Portable Saw

Canadian Fairbanks	[illegible]

Pipe

American Spiral Pipe Works	7
Canadian Pipe Co	86
Dominion Wood Pipe Co	12
[illegible] Concrete Co	22
Gartshore-Thomson Pipe Co.	86
Lock Joint Pipe Co	33
[illegible] & Co	11
National Iron Works	87
Pacific Coast Pipe Co.	1
[illegible]	23
Steel and Radiation	76

Plumbers' Supplies

Standard Ideal Co.	36

Power Engines

Inglis Co., John	65

Paints and Varnishes

Paterson Mfg. Co	90

Pile Driving Machinery

American Hoist & Derrick Co.	2
[illegible] Construction Co.	80

Pumps and Pumping Machinery

American Well Works	14
Beatty & Sons, M.	6
Cooke, A. D.	
Escher Wyss & Co.	
Hopkins & Co., F. H.	92
Inglis Co., John	65
Leonard & Sons, E	73
McDougall Caledonian Iron Works	67
Mussens Limited	4
Ontario Wind Engine & Pump Co.	80
Smart-Turner Machine Co.	1
Waterous Engine Works Co	77

Roofing Materials

	Page
Asbestos Mfg. Co.	24
Galt Art Metal Co.	
Metallic Roofing Co.	69
Metal Shingle & Siding Co.	
Noble, Clarence W	74
Paterson Mfg. Co.	90
Philip Carey Co	
Roofers Supply Co.	87
Standard Paint Co.	34

Railway Supplies

Gartshore, John J.	88
Hopkins & Co., F. H.	92
Mussens Limited	4

Reinforcements. Concrete and Steel

Ambursen Hydraulic Construct'n Co.	89
Canada Wire Goods Mfg. Co.	73
Concrete Form Engine Co.	69
Steel Co. of Canada	19
Steel & Radiation	78
Trussed Concrete Steel Co.	30
Turner, C. A. P.	26

Road Machinery

Case Threshing Machine Co.	79
Hamilton Machinery Co.	15
Morrison & Co., T. A	88
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co.	20
Hopkins & Co., F. H.	92
Mussens Limited.	4
Males Co.	64
Willis Shaw Machinery Co.	64

Stone

Anderson, Geo	18
Britnell & Co.	82
Brodie, Jas.	
Christie, Henderson & Co.	82
Consolidated Stone Co.	73
Contractors' Supply Co.	82
Corinthian Stone Co.	
Crushed Stone, Limited	73
Doolittle & Wilcox	87
Hagersville Contracting Co.	11
Laurentian Granite Co.	83
McMillan & Son, R.	71
Morrison & Co., T. A.	88

Stone

	Page
Myers, Oakley	73
Roman Stone Co	13
Sackville Freestone Co.	8
Sand & Supplies	85
Thames Quarry Co.	80

Sand and Gravel

Rogers Supply Co.	31
Sand & Supplies	85

Steam Apparatus

Sturtevant Co., B. F.	

Submarine Diver

Rouleau, Joseph N.	88

Structural Iron and Steel

Dominion Bridge Co.	84
Steel Co. of Canada	19
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	89
Salter, W. H.	85
Steel & Radiation	76

Sewer Pipe

Britnell & Co	82
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
Gartshore Thomson Pipe Co.	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	33
National Iron Works	87
Ontario Sewer Pipe Co.	21
Standard Drain Pipe Co.	21

Stationary and Power Engines

Case Threshing Machine Co.	79

Slate

Roofers Supply Co.	87

Steel Shingles and Ceilings

Galt Art Metal Co.	

Smoke Stacks

Leonard & Son, E.	73

Tents

Woods Limited	79

Safes and Vaults

Taylor, J & J	73

Testing and Inspection Bureau

	Page
Hunt & Co., Robt. W.	73

Tiles

Smith Marble & Construction Co.	69

Tanks and Stand Pipes

Berg Machinery Co.	
Inglis, John	65
Jenckes Machine Co.	2
Leonard & Sons, E.	73
Marsh & Henthorn	68
McDougall Caledonian Iron Works	67
Ontario Wind Engine & Pump Co.	80

Trade Journals

Castellanos A. W.	80

Valves

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co.	86
Kerr Engine Co.	28
Marsh & Co, Jas.	82
Standard Fitting & Valve Co	82

Ventilating and Heating Apparatus

Gardiner & Gaskill	
Sturtevant Co., B. F.	72

Water Softeners and Filters

Berg Machinery Co.	
American Water Softener	

Wire Rope

Greening Wire Co., B.	67
Smith, Thos. & Wm.	
Steel Co. of Canada	19

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	72
Crescent Wire Iron Works.	
Sackett Screen & Shute Co	
Steel and Radiation	78

Water Wheels

McDougall Caledonian Iron Works.	67
Canadian Boving Co.	29

Water Turbines

Escher Wyss & Co.	67

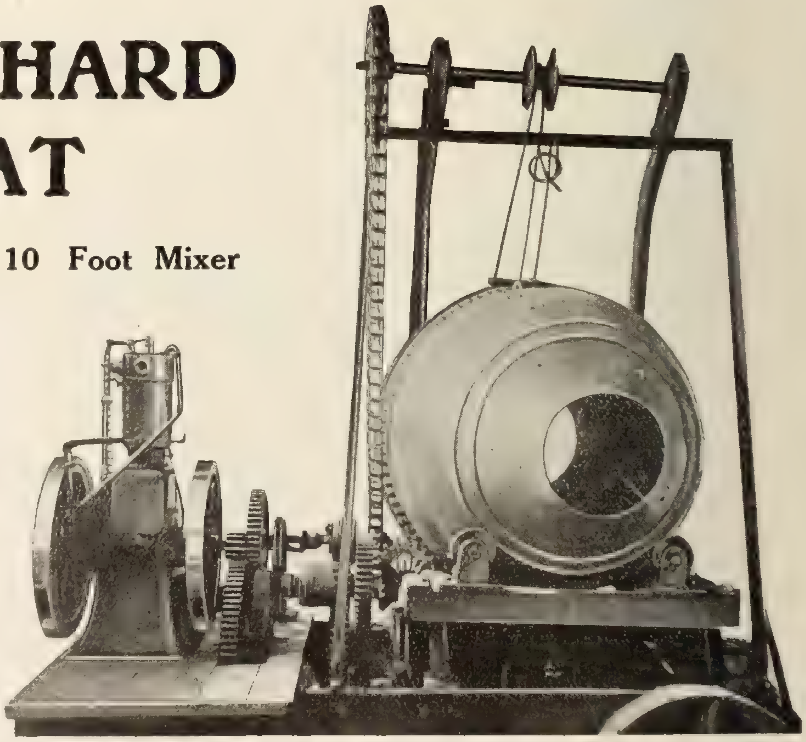
Wheelbarrows

Sackett Screen & Shute Co.	

A MIXER HARD TO BEAT

New Improved Heart-Shaped 10 Foot Mixer

This Mixer is built especially for sidewalk and construction work. It is equipped with the new watering system—a very necessary addition on sidewalk construction. This Mixer is built about 1500 lbs. lighter than our half yard Mixer. Any kind of power may be used.



Send for our Illustrated Catalogue Concrete Mixers and Machinery

WETTLAUFER BROS. 178 Spadina Ave. Toronto

A. R. Williams Machinery Co., 15 Dock St., St. John, N.B. W. E. Ransome, Moosejaw, Sask.

MUNDERLOH & Co Ld.
MONTREAL.

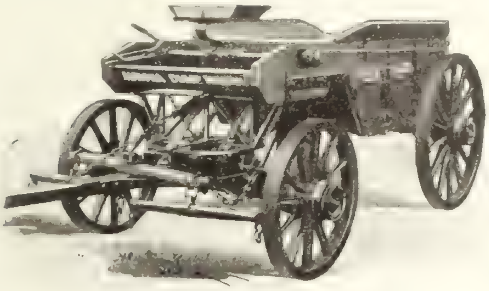
SEAMLESS STEEL TRACTION AND LIGHTING POLES.

MANNESMANN SEAMLESS STEEL PIPES. FOR GAS & WATER MAINS

IN LENGTHS UP TO 40 FEET.
AN IMPROVEMENT ON CAST IRON.
ALL PIPES TESTED 75 ATMOSPHERES BEFORE LEAVING WORKS.
WRITE US FOR ILLUSTRATED BOOKLET.
SEND US YOUR ENQUIRIES.
WE ARE SOLE AGENTS IN CANADA FOR—
MANNESMANN TUBES.
FOR ALL PURPOSES.

THE STRENGTH OF OAK WITH 40 PER CENT SAVING IN WEIGHT

That's the saving effected by constructing the bed of selected Washington Fir, and its just one of the many reasons why lightest weight is combined with greatest strength in the



"Aurora" Dump Waggon

Built low for easy loading, coupled short for lightest draft only 7 feet 4 inch wheel base.
Chains entirely outside of bed, direct pull of chain on doors and length of chains adjustable.
Slotted hinges on doors give vertical movement, preventing installing team on dump.
Study its sturdy construction—its mechanical, labor-saving and dependable qualities. Catalog for the asking.

Western Wheeled Scraper Co.
Earth and Stone Handling Machinery Aurora, Ill.

IN
Montreal, Toronto, Winnipeg, Vancouver

and many other Canadian cities, our **Kalameined Clad Doors** are to be found in the leading office buildings. Architects in all parts of the Dominion are specifying them, they add to the appearance of their building, they give real fire protection. No matter what your detail is, we can execute it correctly and give you doors that are as fine looking as any wooden doors. Our Doors do not bulge between the wood and the iron.

A. B. Ormsby, Limited
Experts in Fireproof Windows and Doors
Factories: - - Toronto and Winnipeg

"HAGERSVILLE"
CRUSHED STONE
FOR
CONCRETE AND MACADAM

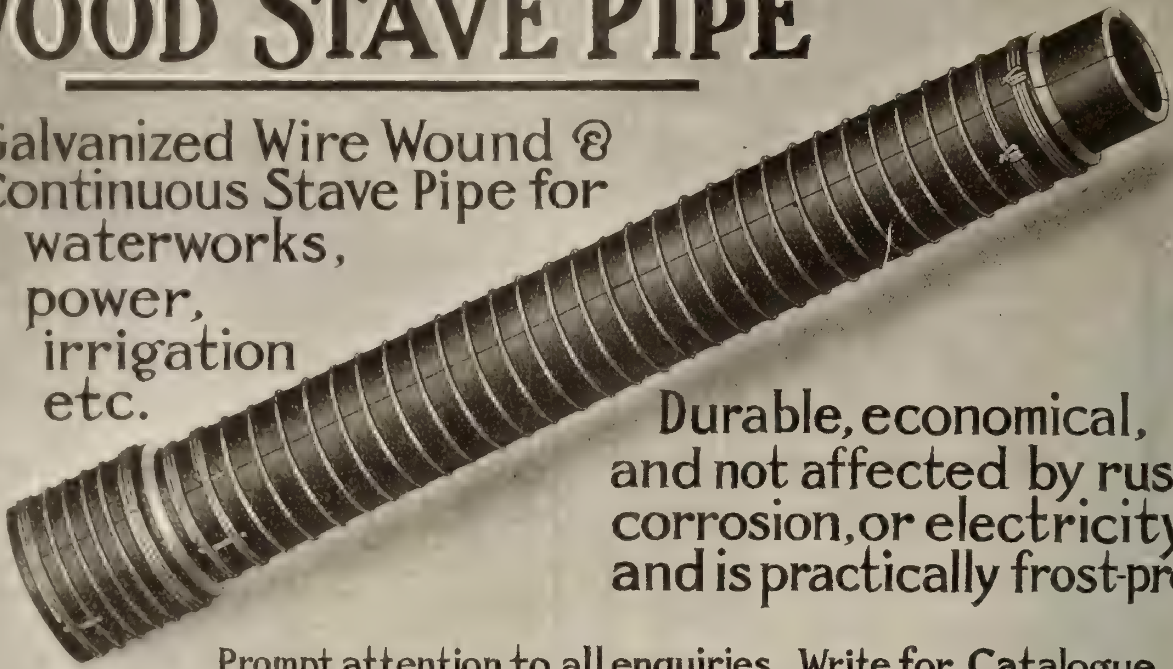
The Toughest Stone for Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.



WOOD STAVE PIPE

Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.

Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Have you any use for a Derrick?

There are large plans under way. Large contracts are being placed. In all directions there is bustle and activity. Everything points to an unusually busy season for construction work of all kinds. But what about equipment?

John T. Hepburn

Scotch Derricks

are in use by all leading contractors in all parts of the country. They are designed and built for hard work, combining safety and high efficiency, with low operating cost. Being made in standard sizes, any part can be replaced at short notice. They may be operated by hand or power—are fitted with single and double purchase gears—powerful band brake—and safety locking device that prevents boom from falling.

We are busy now. We shall be busier in two or three weeks
Better place your order to-day to secure early delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company Limited

Head Office: 504-5 Temple Building, TORONTO

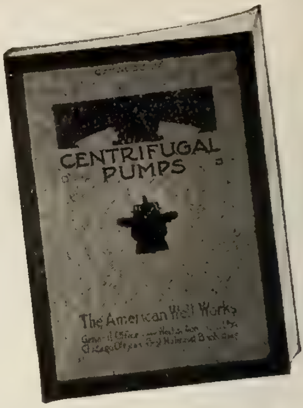
E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

Why "American" Centrifugals

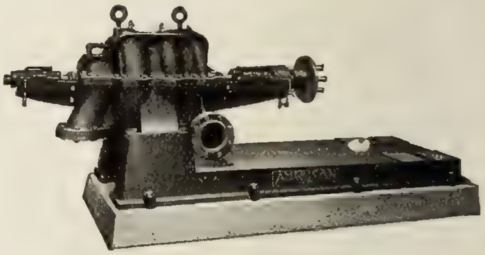
Are Most Economical in the Widest Range of Pumping Conditions.



The reason why "American" Centrifugals are unequalled for economy is that they represent the highest development of the most modern type of pump and there are the best of reasons for this higher development.

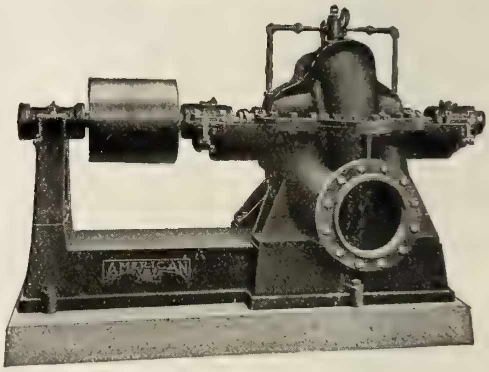
Instead of building a single type of centrifugal and recommending it for every purpose "American" centrifugals are built in over fifty distinct types and every size of every type is carefully tested in our own complete hydraulical laboratory and its efficiency proved before it is permitted to leave our works.

It must meet our standard of efficiency before it is allowed to leave our works and that is what is making the American trademark famous in pumping machinery.

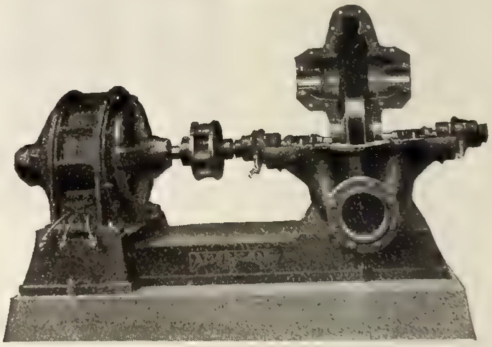


AMERICAN

"American" centrifugals attain up to 80 per cent. mechanical efficiencies and many of our specially designed pumps, installed according to our own specifications, show much higher efficiencies, enabling them to operate against high heads. We have many single stage centrifugals installed operating on over 200 feet heads.



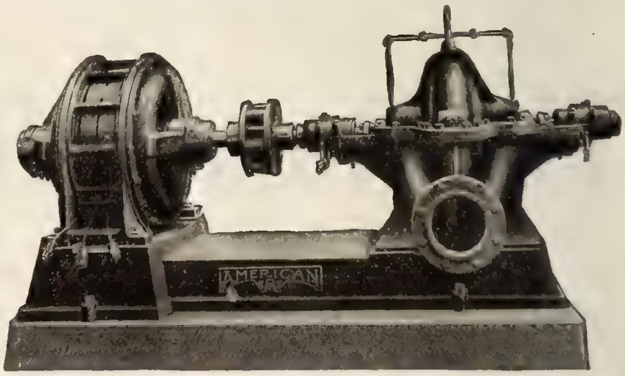
The low first cost of "American" centrifugals as compared with old style plunger pumps, combined with their high efficiencies, low cost for attendance and small cost for repairs make them **far more economical** than any other type of pump in nearly all conditions where **all costs are considered.**



Greatest economy in the end is the claim we make for "American" centrifugals and we are ready to prove that claim.

If you are interested in irrigation, write for our booklet, "Irrigation by Pumping" Bulletin No. 118.

Our General Centrifugal Pump Catalog No. 117 is the most complete ever issued. Write for it today.



The American Well Works

General Office and Works: Aurora, Ill., U. S. A.
Chicago Office: First National Bank Building

Canadian Sales Agency:
231 Craig Street West, Montreal
411 Seymour Street Vancouver, B.C.

'Champion' Road Machinery

Leads all Others

Good design will never compensate for structural weakness.

Structural strength will never make a poorly designed machine good.

It is only when Road Machinery is **right in every respect** that it can be trusted to do all that is expected of it under all conditions.

"Champion" Road Machinery leads all others because it has no weaknesses to offset its invaluable, exclusive features.

"CHAMPION" Rock Crushers

"CHAMPION" Graders

"CHAMPION" Sprinklers and Sweepers, etc.

have born the champion reputation for over 20 years. Write for the catalog before you buy—tell us which machine interests you and we will give full information.

Save 3 to 5 days on Repair Parts

Order all repair parts direct of the Hamilton Machinery Co., 144 York St., Hamilton. By sending direct you will save from 3 to 5 days in shipment of your order.

Manufactured by

American Road Machine Co., of Canada, Limited
GODERICH, ONT.

THE HAMILTON MACHINERY CO., LIMITED, HAMILTON, ONT.

Sole Agents for the Above Company
Also Canadian Distributors for the famous Inter State Automobile.

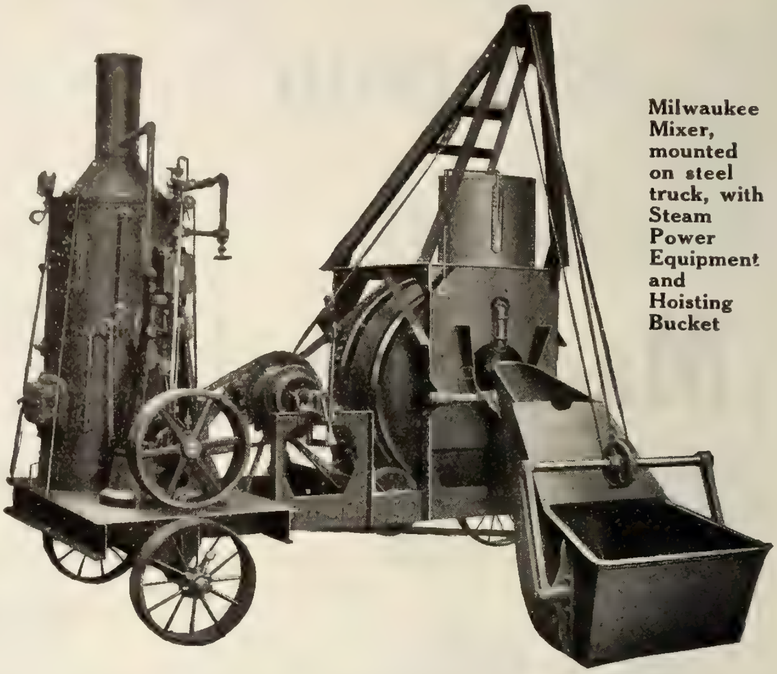
Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

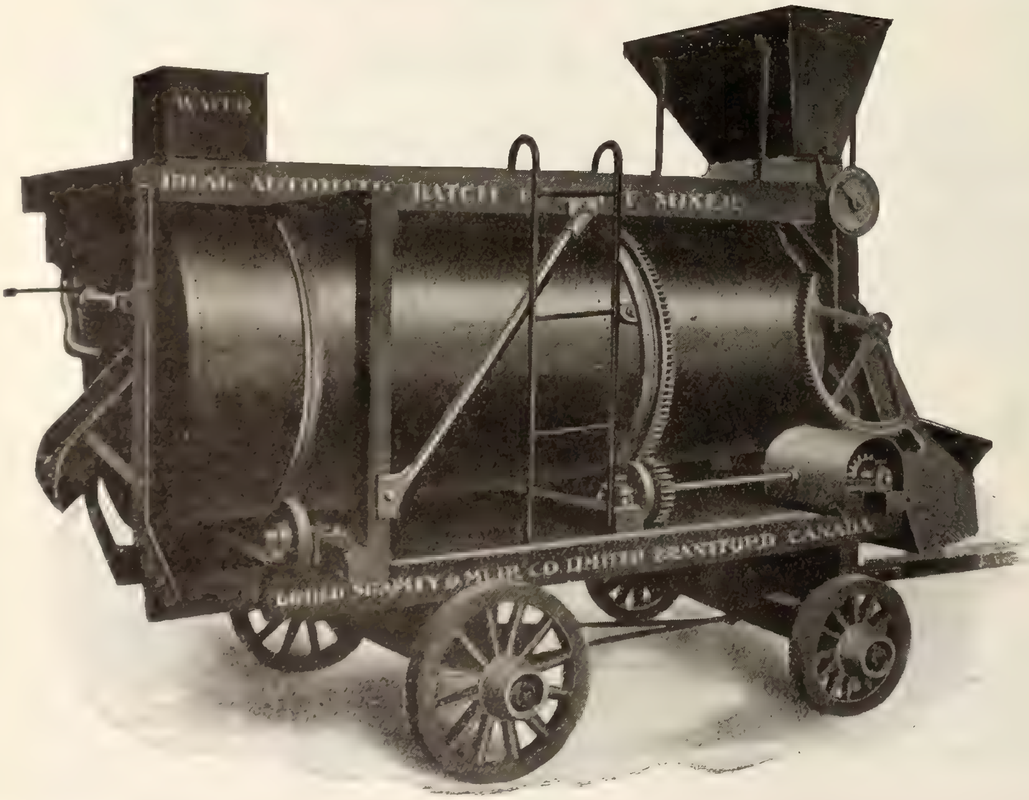
CANADIAN REPRESENTATIVES.

The Stewart Machinery Co., Winnipeg, Man. C. W. Stancliffe & Co., Vancouver, B. C.

H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS


WATER
IDEAL AUTOMATIC BATCH MIXER
GOOLD SHAPLEY & MUIR CO LIMITED BRANTFORD CANADA

Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

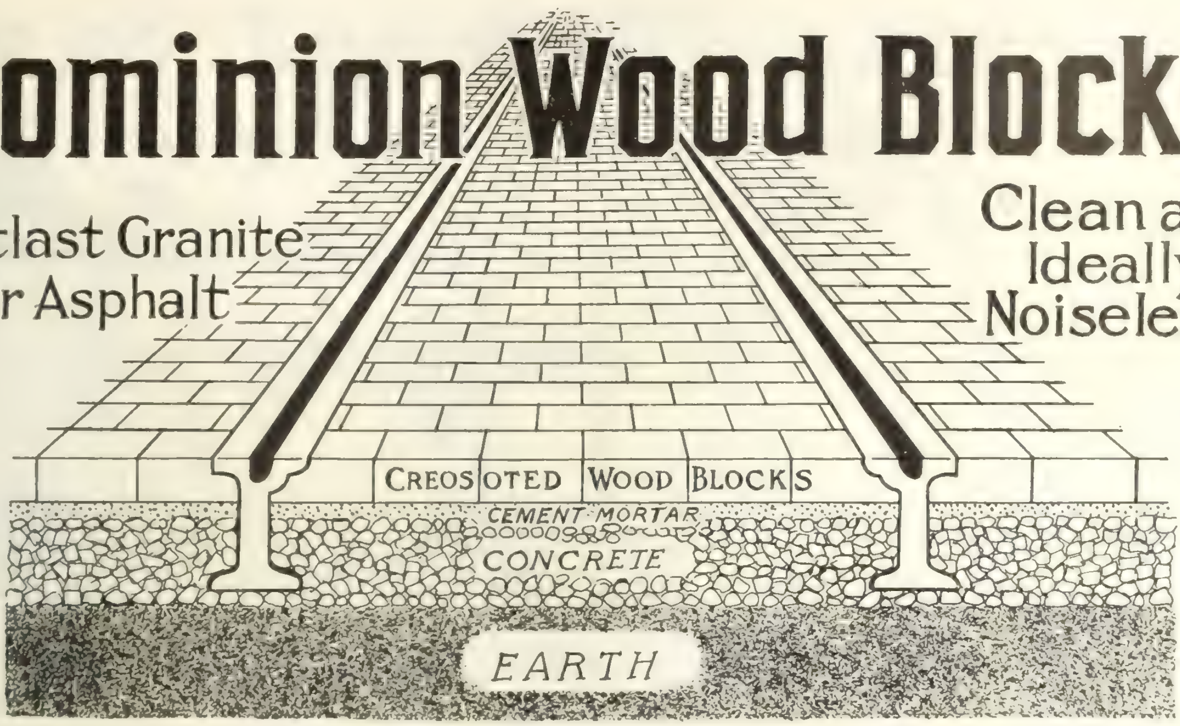
Write for Catalogues

The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada

Dominion Wood Blocks

Outlast Granite
or Asphalt

Clean and
Ideally
Noiseless



Dominion Wood Blocks

make the most durable pavement for all classes of service, from the lighest wear of boulevard vehicles to the grinding of the heaviest trucking traffic. It is the one pavement that won't need the annual attention of the repair gang and will pass out of reserve in perfect condition.

Don't put your money in a pavement that will need patching before the final payment is made on the assessment.

The Dominion Creosoting Co., Ltd.

SUCCESSORS TO

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

Circular Diamond Saws

For Limestone, Marble and Sandstone

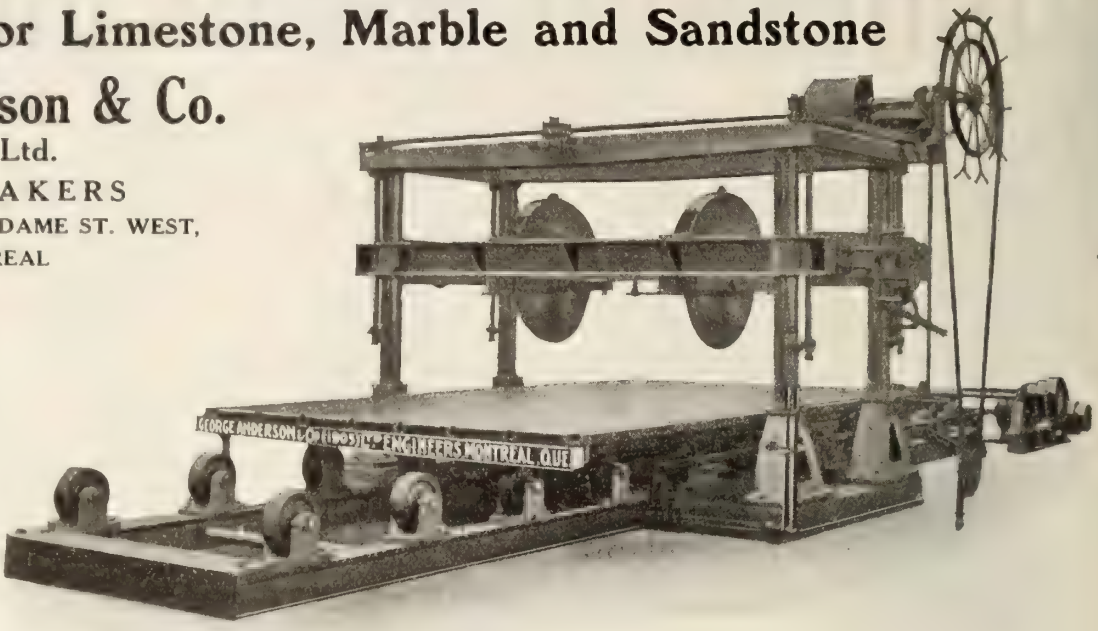
Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICE & WORKS

London, England, 82 Victoria St. S. W., Newark N.J. U.S.A. 420-422 Ogden St., Montreal Works, 157 Craig St. West, Head Works, Carnoustie, Scotland

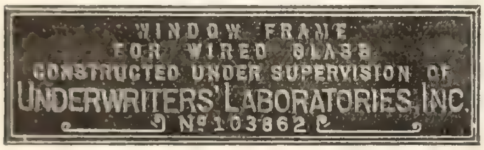
MAKERS OF

CANGS, PLANERS, MARBLE DRESSERS DERRICKS, AND ELECTRIC TRAVELING CRANES UP TO 50 TONS, QUARRY MACHINERY, GAS ENGINES AND PRODUCER PLANTS 10 H.P. TO 150 H.P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 SINGLE AND DOUBLE TABLES

About 50 of the above Machines at work in Canada


WINDOW FRAME
FOR WIRED GLASS
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES, INC.
Nº 103862

Underwriters' Label.

The Underwriter's Test

There is absolutely no question as to the comparative value of our Metal Fireproof Windows over the old-fashioned metal or metal-covered wood shutters. Repeated tests have proved conclusively the superiority of metal fireproof windows.

The ideal fireproof windows should be constructed to meet the following requirements:

It must be absolutely fireproof.

It must have hollow sheet metal frames and sash, fitted with wire glass.

It must be riveted and locked together so that it will not fall apart when exposed to intense heat, solder only being used to finish the seams and mitres.

The Douglas Window has stood the National Board of Fire Underwriters' test to which it has been subjected at their Laboratory at Chicago, and is endorsed by them.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

The

Tillson Company

Limited

WHOLESALE MANUFACTURERS OF

Sash, Doors, Mouldings, Frames for Doors and Windows, Columns, Interior Finish of Every Description, Porch Work, Gable Ornaments, Brackets, Head Blocks, Corner Blocks, Base Blocks, Door and Window Screens, Etc.

Millwork of all kinds

Tillsonburg,
Ontario

The Steel Company of Canada
Limited

Plain Rounds and Squares

Cold Twisted Squares

Maxwell Deformed Bar

HAMILTON - TORONTO MONTREAL

J. H. NEW, President RYLAND H. NEW, Vice-Pres.

Hamilton Vitrified Salt Glazed Sewer Pipe

Known as the best for 50 years
The Quick Shippers

The HAMILTON & TORONTO SEWER PIPE CO., LIMITED
HAMILTON and TORONTO

LONG DISTANCE PHONES: Toronto, Main 990, College, 1558
Hamilton, 3990, 3991, 3432

We are in the Cement Concrete

Culvert & Sewer Pipe

Business

Have Been Building

Concrete Pipes

For Twenty Years.

Our quality is the highest. Our prices the lowest. Sizes 6 to 45 inches (REINFORCED.)

Railways and Corporations are amongst our satisfied customers.

Write us your wants—we do the rest.

Ebenezer North Co.
LONDON, ONTARIO

Canadian Bucyrus Steam Shovels

Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert Pipes

We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

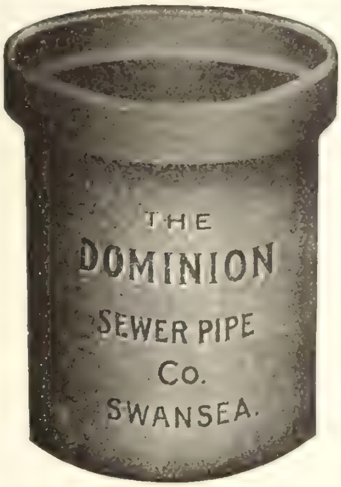
We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA

Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) **Limited**
SWANSEA (near Toronto)

The Pipe of the Hour — Mimico Brand

MIMICO PIPE IS RIGHT

ROUND PIPE and SQUARE DEALINGS

It is not Gas Pipe nor Steam Pipe, it is

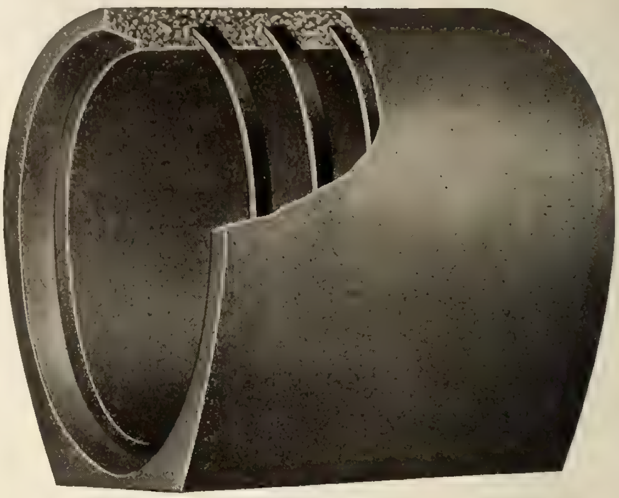
SEWER PIPE

MEN who know have
Intimated to us
Many times that
It pays to buy "Mimico." The
Cost is little or no more than
Other makes.

Perhaps you are
Interested in
Proposed contracts. Ask the
Engineers about it.

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422; Evenings, Park 3888 and 3889

Railway Engineers and Contractors



36" Section

Timber culverts rot, clay pipe culverts break from frost or weight, metallic culverts rust and are woefully dear, CONCRETE CULVERTS LAST FOREVER and the price is relatively low.

The only absolutely **durable and frost-proof** culvert pipe is

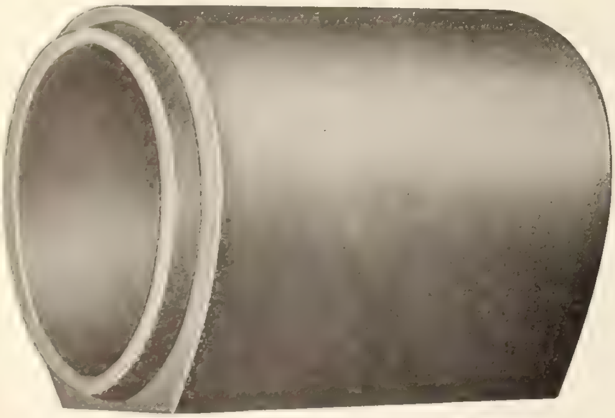
REINFORCED CONCRETE

of **first quality.** The prime requisites of first quality concrete are **good raw material, proper proportions** and **scientifically correct methods.**

We possess all these in the highest degree. Our years of experience, our facilities and our raw material enable us to make **good concrete** and make it **always good.**

Nowadays the railway engineer must get results in **permanency** as well as in other matters. The contractor too must get results if he is to stay in the game. A very important result to him is the **economy** of buying material that **holds out,** that can be handled with **facility,** and that can be procured **promptly** and at a **reasonable price.**

Don't imperil your interests by using non-durable material, or by trusting to the random hits and misses of a novice when you can buy **durable, mature,** and **guaranteed concrete pipe,** from a long-established and reputable firm.



[illegible] Section

Mature Stock

Prompt Shipment

Quality Guaranteed

No Loss from Breakage

Low Prices

WRITE FOR CATALOGUE AND PRICES

Dominion Concrete Co., Limited

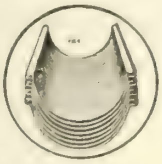
KEMPTVILLE, ONTARIO

PEDLAR NESTABLE CORRUGATED GALVANIZED CULVERT

Is the Strongest, Most Practical, Durable and Easiest Laid Culvert Made

YOU ought to show this advertisement to your township reeve or warden. Get him to write for the free book about Pedlar Culverts, or write for it yourself and tell him about this new Culvert—the quickest, most economical, strongest for any use any culvert can serve.

THESE culverts of mine are a great thing for the farming world. They not only make good roads possible, but they serve the farmer in many other ways. And they are so simply laid. They come nested like this.



This compactness saves freight and makes it easy to handle them. You put the sections together like this:

Then you clamp the flanges together like this:

And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

G. H. Pedlar

See How It Saves Farmers' Money, Betters Roads, Lowers Taxes

This picture is from a photo of a wash-out fourteen feet deep in the Township of Darlington, caused by use of cement tile for drainage purposes. The township authorities have replaced that with Pedlar Perfect Culvert, forty feet in length by three feet in diameter; strongest, easiest laid and most durable they could get.

This picture of the Pedlar Perfect Culvert assembled and ready to lower into place, shows the immense strength and rigidity of these Culverts. Though forty feet long with a bearing of only a few feet at the centre it does not give one-sixteenth of an inch. See how easily Pedlar Culvert can be lowered into place. No skill needed.

Here you see the Pedlar Culvert doing its work of drainage twenty-five minutes after being put in place. It would have taken three times as long and cost three times as much to have installed any other type of culvert. Yet this Pedlar Culvert will last far longer and give no further trouble of any kind.

This view shows the Pedlar Culvert after the fill-in was completed. The Culvert has to carry a dead weight of several hundred tons of earth, as well as the live weight of traffic passing overhead. But that can't strain Pedlar Culvert, which will neither give nor spring. It stands what no other Culvert can.

Write for My FREE Book No. "23" and Sample

and get a correct idea of what makes a good Culvert. Learn how Pedlar Culvert can be used on your farm.

The PEDLAR PEOPLE of Oshawa

[illegible] Address nearest place

HALIFAX 16 Prince St
ST. JOHN, N.B. 42-46 Prince Wm St
MONTREAL 321-3 Craig St W
LONDON 86 King St.
OTTAWA [illegible]
TORONTO [illegible]
CHATHAM 200 King St. W
QUEBEC 127 Rue de Pont
REGINA 1901 Railway St. S
WINNIPEG 76 Lombard St
PORT ARTHUR [illegible]
CALGARY 1112 First St W
VICTORIA 434 Kingston St
VANCOUVER 821 Powell St.

The Only Everlasting Roof

Asbestos Cement Slate

"This is practically indestructible by atmospheric influences, so that maintenance expenses for roofs covered with this material are excluded.

For a period of three months the asbestos cement slate absorbs, and assimilates moisture in exactly the same ratio as the best natural slate. After that time the absorption ceases altogether, and the material becomes impervious, indestructable, and as hard as iron.

The stringy asbestos fibres, which, by characteristic peculiarity of a patented process, are embedded cross-wise in the cement paste. This has exactly the same effect as concrete-steel constructions. They impart to the asbestos slate extremely high physical strength, indifference to blow or shock, and great elasticity. These properties are of the same importance to conveyance, and the laying of the asbestos slates, as they are to their durability and length of service.

The insulating capability of asbestos when brought to bear either upon heat or cold, imparts an increased importance to asbestos cement slate, not only in its suitability for the tropics—where it is commonly used as a substitute for corrugated iron; but also for the continental climate, where it is economically used in workshops, in dwelling rooms, and particularly over garrets, which, with other roof coverings, would have to remain unoccupied.

The fireproof quality of asbestos renders asbestos cement slate a thoroughly fireproof material, which, owing to its strictly scientific manufacture, cannot become either cracked, rent, or scaled in case of fire."

The above is an extract, word for word, from a government report of the Canada Department of Mines.

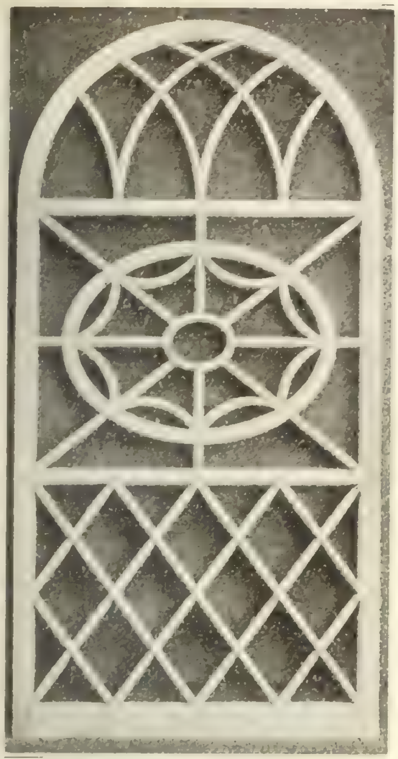
We are the only manufacturers of asbestos shingles or slates in the Dominion of Canada."

Specify

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P.Q.
Factory at Lachine, P.Q.

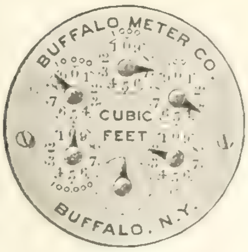


Diamond Sash

particularly suited for Gothic and Queen Ann style windows. It is impossible to successfully manufacture these sash without the proper machinery, but we have it. Every light is uniform, the joints are perfect and all the lines are absolutely straight where they should be and uniformly curved in the curved parts;

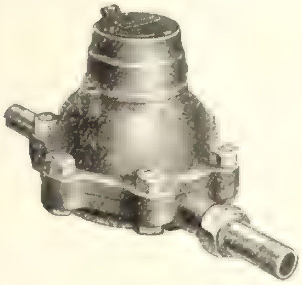
M. Brennen & Sons Mfg. Co., Ltd.
HAMILTON, ONTARIO

AMERICAN AND NEW NIAGARA
WATER METERS



Standard Dial

Straight Reading Dial



Jewel Bearing
Intermediate Gears
Self Cleaning and Sanitary
Adjustment for Pressure
Extra Thick, Strong Disc
Accuracy Guaranteed
Fewest Parts

BUFFALO METER CO.
290 TERRACE, BUFFALO, N.Y.

The United States Steel Corporation, at Gary, Ind.;
Stone & Webster Engineering Corporation, Minneapolis, Minn.;
A. Monsted Co., Milwaukee, Wis.;
Geo. B. Swift Co., 903 Security Bldg., Chicago.;
Pacific Coast Condensed Milk Co., Seattle, Wash.;
Sheffield Farms-Slawson Decker Co. Amenia, N.Y.; and
Inland Steel Co., Indiana, Ind.,
are among the largest users of concrete in the United States. They and many others, are using

REICHERT METAL FORMS

And saving from 3 to 7 cents per square foot.

Why do YOU stick to the old methods and let this additional profit slip away from you?

Building a big factory building with Reichert Metal Forms. Pacific Coast Condensed Milk Company's plant at Berlin, Wis. Stone & Webster Engineering Corporation, builders.

REICHERT MFG. CO.
MILWAUKEE, WISC., U.S.A.

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City

Hardwood Flooring and Interior Finish

"WILSON BROS. LIMITED" on flooring means a carefully kiln dried and well manufactured article. Our flooring is straightened, hollow-backed, bored, end-matched, steel polished and bundled. -:- -:- -:-

We specialize in Veneered Doors to detail.

Wilson Bros. Limited **COLLINGWOOD, ONT.**

The Mushroom System

Of Reinforced Concrete is strong, economical and durable. Based on scientific principles, every pound of steel does the work it is designed to do.

The system is fully covered by broad patents in Canada, the United States, and all civilized foreign countries.

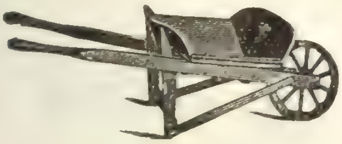
For lists of buildings, descriptive literature and estimates, address

C. A. P. Turner, M. Am. Soc. C. E.
816 Phœnix Building, Minneapolis, Minn.

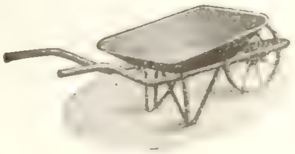
The Meaford Wheelbarrow Co., Limited

MEAFORD, ONT.

Manufacturers of



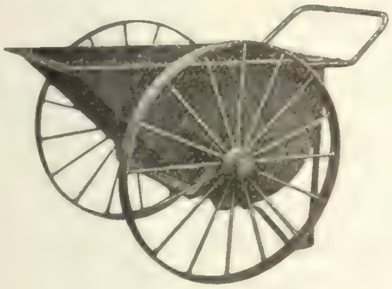
Wheelbarrows of every description, for every purpose. If it is a Wheelbarrow you want we have it in Railroad or Navy, Steel Tray or all Steel, Garden or Lawn.



Wheel Scrapers, pressed bowl or square box in two sizes Nos. 2 and 3.

Drag Scrapers, pressed steel handles on top or sides, with or without runners.

Ox Shovels, Fresno or **Buck Scrapers**

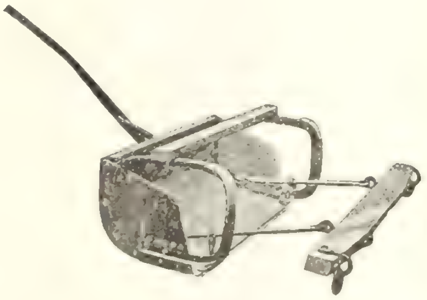


Dump Carts, Dump Cars, Grading Ploughs

Trucks, Bag, Warehouse, Platform

Sterling line of Roller Bearing easy pushing Concrete Wheelbarrows and Carts

Write for prices and complete catalogue



THE MILTON PRESSED BRICK Co. LIMITED

Why You Should Specify Milton Pressed Brick

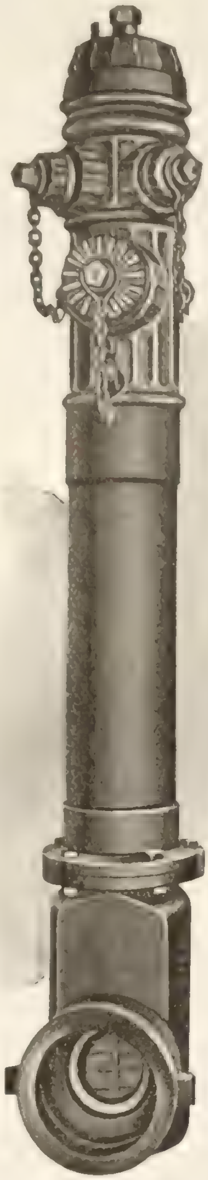
For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

We are Agents for the Fiske Tapestry Brick, suitable for high-class residential work. At our Toronto Office we have set up panels of the different color schemes and would be pleased to have you call and examine them.

Head Office: Milton, Ont. Toronto Office: Janes Building

EADIE-DOUGLAS LIMITED, Ottawa Agents

Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

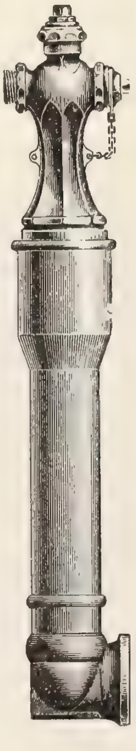


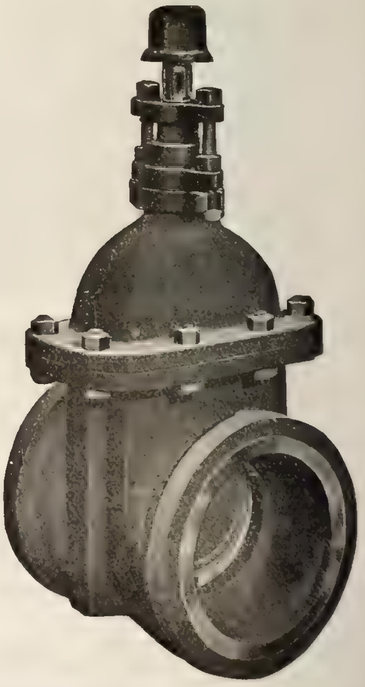
KERR
Valves and Hydrants

are used by cities and towns in every part of the Dominion. They have a reputation built up by years of long and satisfactory service. YOUR municipality should specify "KERR" for all waterworks' contracts.

Unsurpassed in
Workmanship
Design
Material
Efficiency

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.





John Whitehead & Co.

LIMITED

Albert Works: PRESTON, ENGLAND

Makers of

Reliable

Efficient

Tile and Pipe Machinery, and

CLAY WORKING PLANT

for all classes of Clays and Shales.

INQUIRIES SOLICITED. CATALOGUES POST FREE.

Established over 75 years. TELEGRAMS: Brictile, Preston

Representatives in Canada: Messrs. Chambers & Simpson, Engineers, Toronto

---

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

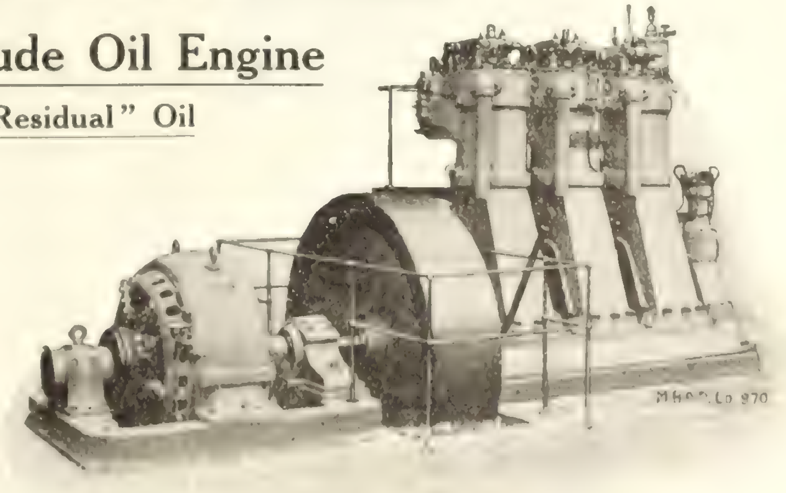
The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear
No Producer
No Chimney

No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdowns
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses



HIGH SPEED **SLOW SPEED**

35 to 1000 B. H. P.

KAHN SYSTEM

of Construction

includes

UNITED STEEL SASH made of specially rolled steel allowing a maximum of light; is strong, rigid, fireproof, weatherproof. Write us for particulars.

KAHN TRUSS BARS maximum strength and efficiency, minimum labor costs in placing.

RIB BARS a rolled deformed bar which prevents slipping in the concrete.

RIB METAL -steel mesh reinforcement for floor and roof slabs, cisterns, walls, etc.

HY-RIB self-centreing reinforcement for floors, roofs, walls, partitions, silos, cisterns, etc.; used with concrete or cement mortar; no studding or wood forms required.

TRUS-CON—chemical products for waterproofing and finishing concrete.

Trussed Concrete Steel Co.
of Canada, Limited
Head Offices and Works, Walkerville, Ont.

BRANCHES:
TORONTO—23 Jordan St.
WINNIPEG—Union Bank Bldg.
MONTREAL—128 Coristine Bldg.
VANCOUVER—52 Hutchinson Bldg.

WE WANT MEN

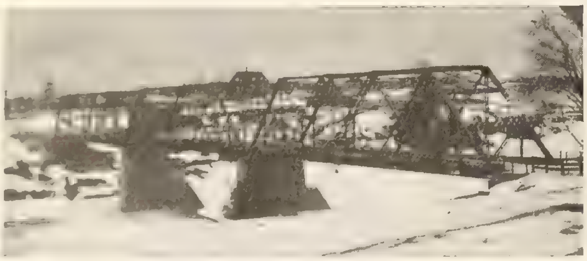
We require a man in every important town in Canada to report the progress of the building and engineering activities of his locality. We want men to tell us when machinery, equipment, supplies and materials are required—men who can report promptly and accurately news of all sales opportunities in these trades.

We report this information daily to our subscribers. This enables them to get in direct touch with the buyer.

There are one or two places where we are not represented. Perhaps it is your town. It will be worth your while to ask us.

MacLean Daily Reports
220 West King Street, Toronto

Steel Bridges
and Concrete Work



For over a quarter of a century we have been building Steel Highway Bridges throughout Canada.

Our experience is at your disposal.

We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

Get our figures before closing your contracts.

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

The Contractor's "Money Saver"

Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment — Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto — write us **to-day.**

MACHINE PAYS FOR ITSELF IN A FEW DAYS.

" Little Giant Floor Scraper "

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

Tel. Main 4155

We are now in the

Sand Business

Our Wagons hold $2\frac{1}{2}$ Yards

High Grade Sand and Prompt Delivery

Rogers Supply Co.

28 King St. West,

Toronto

KITON is nothing else but **TAR**

which through a Patented Process is made

Soluble in Water

This solubility however is lost, the moment KITON becomes dry for the first time, that is, after evaporation of the water with which it is mixed. From that instant on, KITON can never be re-dissolved in or washed off by water. It is **impervious** and **weatherproof.**

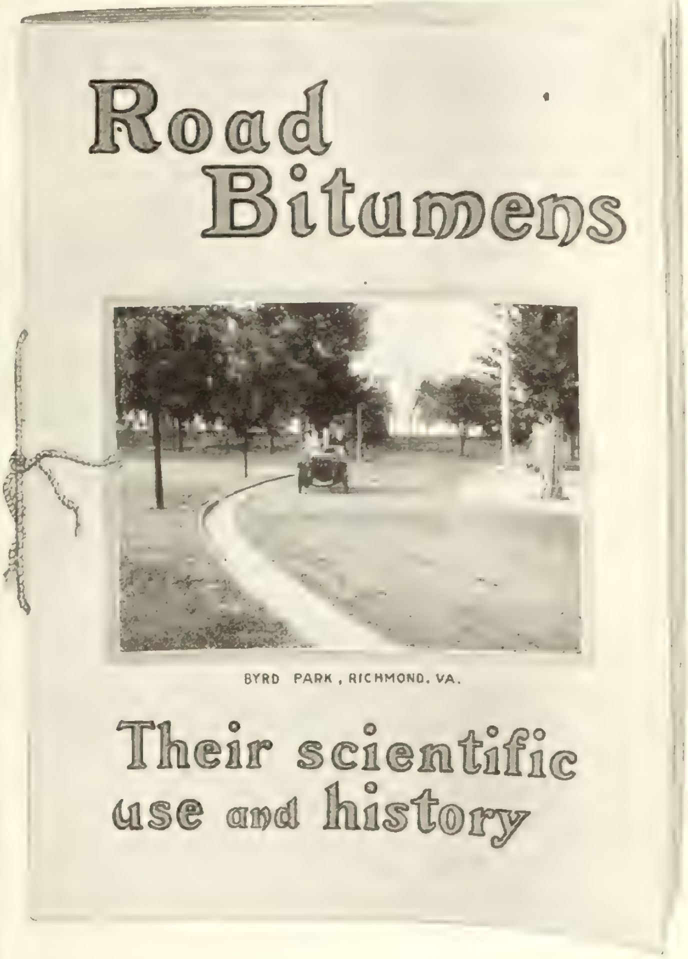
just like tar

BECAUSE it can be applied as easily as ordinary paint,
" it can be coloured if desired,
" it is so economical and yielding,
" it is instantly ready when you want it.

KITON is the cheapest and most reliable surface coating for material subjected to the deteriorating action of weather and atmosphere.

ASK FOR BOOKLET, SAMPLE AND PRICES
ATTRACTIVE PROPOSITION FOR DEALERS

F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.

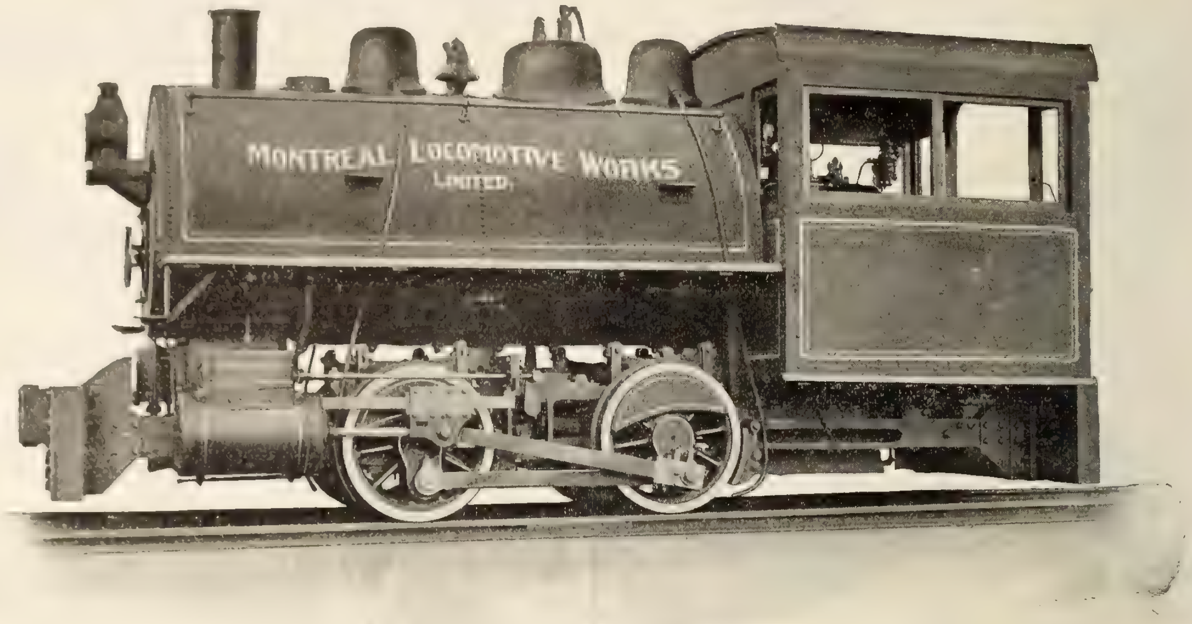


There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a pamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement
Company
First National Bank Building
CINCINNATI

CONTRACTORS LOCOMOTIVES



ONLY ONE QUALITY

Montreal Locomotive Works, Limited, standard contractors locomotives are designed by engineers who have made a life study of the special conditions of contractors service and know what is needed to meet these conditions.

Their large boilers insure free steaming and ability to handle the load for which they are rated. Every piece of material entering into their construction must conform to the same specifications required for 200-ton locomotives. Only the best materials are used.

Contractors locomotives must frequently be operated long distances from repair shops, therefore simplicity and facility for repairs are vitally necessary. This was considered in designing this type of locomotive.

Every part is made in jigs or to gauges, and every part is sure to fit. Stocks are always available at our Works at Longue Pointe, Montreal, Canada.

MONTREAL LOCOMOTIVE WORKS, LIMITED

OTTAWA BANK BUILDINGS, MONTREAL, CANADA

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

Manufacturing 60 inch pipe for the Low Level Interceptor, Toronto.

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

Write for Illustrated Catalog

QUEBEC AND ONTARIO
Francis Hankin & Co.
231 Coristine Bldg., Montreal
199 Yonge St., Toronto

MANITOBA, SASKATCHEWAN AND ALBERTA
F. H. McGavin Company Limited
103 Osborne St., Winnipeg

BRITISH COLUMBIA
Pacific Lock Joint Pipe Co.
1005 A St. Tacoma, Wash.
Globe Bldg., Seattle.

RU–BER–OID ROOFING

Trade Mark Registered

Protects Your Reputation

You know how it works out.

When a roofing claimed—perhaps guaranteed for 10 or 15 or 20 years, starts to leak in one-third of that time the blame must be placed somewhere.

Too frequently it is shifted on to the contractor who laid it.

Before you tie up any part of your reputation in a roof, consider well the roofing. We do not need to tell you that there are many prepared roofings with which no man can do a good job.

But when you lay a **RU-BER-OID** Roof you have no trouble making a job that will be a credit to you. Skilled, expensive roofing is not required, either, for laying a **RU-BER-OID** roof and, laying it right, is simple, quick and easy.

Once laid properly, with seams and nail-heads well cemented, a **RUB-ER-OID** roof will give perfect satisfaction under any and all conditions. Extremes of heat and cold do not affect it. It is proof against gases, fumes and acids. It will not check, crack, loosen at the seams, rot, get spongy, porous or crumbly, or hard or brittle.

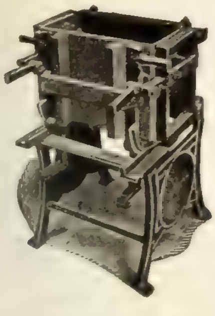
The first **RU-BER-OID** roofs laid 20 years ago are still sound and weather-proof. How much longer they will last we cannot say. But even twenty years of service would be a good tribute to your work.

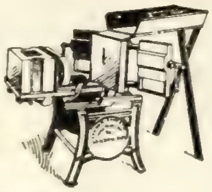
For the sake of your reputation, use your influence to have **RU-BER-OID** used on the roofs of the buildings you erect, in preference to any of its three hundred imitations. It will pay you.

If you are not thoroughly posted on **RU-BER-OID'S** advantages, write us. We will be glad to send you samples with booklets and full information.

The Standard Paint Co. of Canada, Limited

286 St. James St., Montreal
105 Tenth Ave. E. Calgary
179 Bannatyne Ave. E., Winnipeg
25 Pender Street W., Vancouver





London

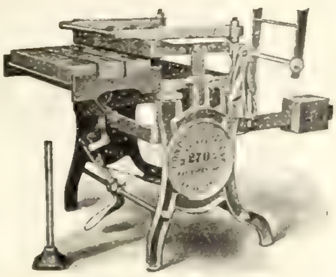
Face-Down Adjustable

Concrete Block Machine

makes every kind, size and design of block. **All sizes of blocks made** in the **one adjustable mould. All sizes of blocks made** on the **one size pallet.**

Any size core desired can be used which is withdrawn vertically and thus allowing all blocks to be made by the wet process, or with crushed stone in the block. Machine fully **covered by patents.**

SEND FOR CATALOGUE.



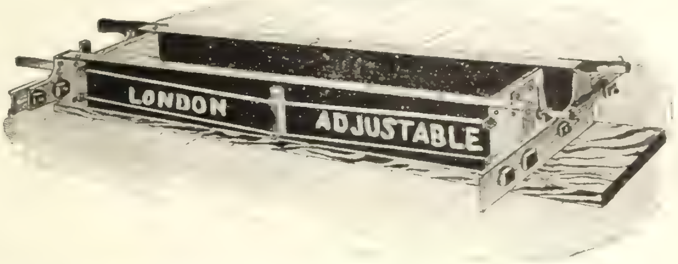
London Cement Pressed Brick Machine

Hundreds in operation. Needs no recommend from us. The brick **have frog impression.** The only machine which makes a brick **polished on every side.** Our **self-racking pallet** does away with racks for curing which makes it possible for the contractor to manufacture the **brick on the ground** where the building is to be erected. One man operating makes 5000 brick per day.

Our catalogue tells all about it.

The London Adjustable Sill, Step and Window Cap Mould

Every Contractor and Manufacturer of Cement Products should know the class of goods that can be produced on this mold. **Can you afford to be without one?** Write for catalogue and learn what this mold will do.



We also manufacture London Standard Drum Batch Mixers in five sizes, London Automatic Batch Concrete Mixers in two sizes, Cement Brick Machines, Face-Down Block Machines Power Drain Tile Machines, Hand Drain Tile Machines, Silo Curbs, Sewer Pipe Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

London Concrete Machinery, Co., Ltd.

19 Marmora Street, London Canada

Branches

A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.

No Wet Cellars No Damp Basements

Ceresit is a cream white paste readily dissolvable in water. This water is used instead of plain water for mixing Cement, Mortar or Concrete.

Ceresit Waterproofing Co.

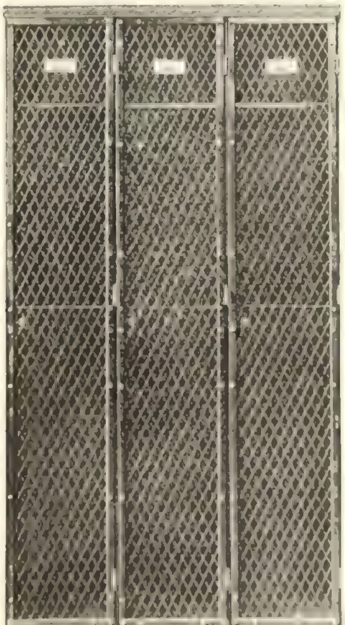
115 Adams Street, Chicago

Canadian Agents

Eadie Douglas, Limited
Montreal, Toronto Ottawa

Grose & Walker, Limited, Winnipeg
Dean Thompson, Vancouver

The Up-to-Date Building



Should be equipped with metal lockers for the safe and sanitary keeping of clothing.

If you appreciate good value and rigid construction in a locker, you will use MEADOWS' METAL LOCKERS on your next contract.

Send for our interesting booklet entitled

"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA

Concrete Mixers

SPECIAL REPRSENTATIVE
C. L. TRIMINGHAM
Canada Life Bldg.
WINNIPEG

We want to send you a booklet giving a brief and interesting history of our Mixer. Before you make any further purchases it will pay you to read our literature which is based on actual results. Let us know your wants for we believe we can interest you in our Concrete Mixer.

485 St. James St., MONTREAL **485 St. James St., MONTREAL**

CANADA FORD COMPANY

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

THE STANDARD IDEAL COMPANY LIMITED

GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

Of Importance to the Plumber

We now have a set of booklets, pocket size, showing our fixtures and their **roughing in measurements.**

Booklet A—Bath Tubes, etc.
" B—Lavatories and Drinking Fountains.
" C—Sectional Lavatories and Wash Sinks.
" D—Laundry Tubs and Wash Sinks.
" E—Range Closets and Urinals.

If you have not received these we will send them to you free of charge upon request.

STANDARD IDEAL COMPANY, Limited

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1888

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 July 5, 1911 No. 27

The Decrease in Efficiency of Labor Conditions

It requires but a short perusal of building statistics to confirm what has been frequently stated regarding the costs of construction work. These have been increased during the last five years all the way from 25 to 50 per cent. This is the result of a demand for higher wages and greater outlay for stock and provisions. The prices of many materials of construction are also on the increase. Combined with this comes the intimation that there has been a pronounced decrease in efficiency of labor during this period. This appears to apply to skilled and unskilled laborers alike. The result of this condition of decreasing efficiency with increasing wages weighs heavily in the comparison of construction work of to-day with construction work done a few years ago. The cause is difficult to approach, and no convincing reasons expose themselves. Whether the condition may be traced to lack of interest and incompetency of workmen or foremen, to the excessive increase in the number and magnitude of engineering projects, to the result of organized labor, or to more local or more general causes, it is a question for open study and debate.

Whatever its cause the fact remains, which is the vital thing, and there is no clear reason why it will not continue. This at least is the attitude, we believe, that employers of construction labor must assume. To deal with the new conditions the contractor is obliged to study means of reducing manual labor and methods of more scientific management. Labor saving machinery and tools must take the place of men to the utmost practicable degree, and the usefulness and up-to-dateness of these appliances must be kept constantly under supervision. A wide channel for waste of money through inefficiency may be accounted for by poor and defective tools and cheap, out-of-date plant. They place a severe handicap on able and skilled laborers.

Men, however, will always count high in construction work no matter how many or what labor saving machines are used and the solution of the problem evidently lies in better management of men. It is obvious that the old rule of "drive 'em" no longer holds good. There must be an incentive greater than the regular daily wage or fear of the boss. The condition is no longer a case of what the contractor wills to do; it is case of what he must do. If it be a new condition it must be met by new methods. The method that promises most is a modification of the time-honored wage system of paying men, the introduction of some sort of bonus system whereby a man will receive payment in proportion to the work done.

When Time Flies

A complaint that is heard quite frequently from manufacturers and contractors for municipal work such as water power plants, sewerage systems, and the like, relates to the short time given them to prepare their bids. Corporations issue a call for tenders which state a time limit frequently less than two weeks from date of issue. When the interested contractors write for specifications several days and often a week elapses before the reply is in hand, providing they do receive a prompt reply, which, owing to press of work in the engineering office is not generally the case. Thus a more distant contractor is obliged to wait while a firm more fortunately placed, geographically, is hard at work with figure and fact. When the required information arrives, owing to the brevity of time remaining before the call for tenders closes, he finds it impossible to do justice to the specifications in hand or to his own organization.

The protest is frequently met with the sauve reply that the work is to be executed henceforth with all possible speed and that no delay can occur before construction is under way. Oftentimes a statement is appended to the effect that the greater length of time demanded for preparation of specifications necessarily cuts the contractor's consideration short.

That the preparation of the specifications and plans are given a great deal of time and consideration by the engineers in charge is certainly in the interests of the corporation for whom the work is to be done. But in many cases it may also be to their interest if sufficient time were allowed by them between the publication of their advertisement for bids and the date of letting, to allow for the correspondence more or less necessary to obtain exact data (as specifications are not infrequently lacking in sufficient data for intelligent quoting). One month or six weeks allowed contracting firms in this way would undoubtedly be beneficial to all parties concerned. To the contractor it would allow sufficient time to procure specifications and subsidiary correspondence, consider important matters such as site, accessibility, etc., and submit his tender, without the admonition that one hundred and one points were overlooked in the flurry. Between corporations and contractors or manufacturers such procedure would create clear cut understanding that means a saving of time, mind and money. It is also assuredly in the interest of the corporations as well as the manufacturers and contractors that there should be enough copies of the specifications, tenders, and instructions to bidders, to supply all parties who wish to tender.

"No Canadians Need Apply"

Under this head in another column will be found a communication from Victoria, B. C., bearing upon a recent appointment of a consulting engineer for the Sooke Lake waterworks project. The discussion ensued from the passing of the by-law by the city of Victoria last January for the construction of a 12,000,000 gallon water supply by gravity flow from Sooke Lake, at a cost of $1,500,000, involving five miles of tunnelling, a service concrete reservoir, and a subaqueous crossing of a tidal river. The letter being one of a number of similar tone we withhold signature. Each letter protests vigorously against the failure of the city council to call for applicants for the position.

The Victoria Colonist of June 8, reporting the meeting, has this to say:

The discussion on the appointment aroused considerable feeling and the debate occupied practically the entire time of the meeting.

Alderman Ross asked why the city had not called for applications for the position, and Alderman Langley advocated the appointment of a Canadian engineer, calling the attention of the mayor to a letter which the latter had received in March last from the secretary of the Canadian Institute of Engineers. This communication was to the effect that a Canadian should be appointed to the position, and Alderman Langley thought it surprising that no answer had been vouchsafed by the mayor. The members of the council should have known of this letter. Alderman Langley instanced cases where Canadian engineers had made good, and while he did not wish to say anything about the American applicant, still he believed that a home-grown engineer should be engaged.

Mayor Morley deprecated the importance of the Canadian Engineers' Institute, declaring that from whichever side of the boundary a man came from he did not care as long as the city got results.

Alderman Langley cited Smith's Hill reservoir as an example of United States engineering talent, while Alderman W. F. Fullerton declared that the Canadians in question were capable men, and no one saw them "sending pamphlets around and seeking the job."

The Smith's Hill reservoir project mentioned above, it is stated, has been a failure inasmuch as it has yet to contain a volume of water anywhere near 7,000,000 gallons, for which it was constructed.

The selection for the position was made at the suggestion of the water commissioner, who in his report referred to his comparison of the two proposals as follows: "After careful consideration of the two proposals I am of the opinion that that of the American engineer is the better one, principally on account of its being somewhat cheaper, and I would recommend that it be accepted."

Previous to the final meeting this statement of comparative costs was shown to be incorrect and the proposal of the Canadian application to be the cheaper. The latter requested an opportunity to be present at the meeting, as had already been given to the American candidate for the position.

The feeling is evidently strong among the engineers of Victoria and Vancouver against the methods that their city councils employ in the letting of their work. Among other cases it will be remembered that the Vancouver branch of the Canadian Society of Civil Engineers were obliged to frame a protest early last November when the civic authorities were on the point of appointing for a term of five years an American firm of consulting engineers without making any enquiry as to the appointment of Canadians. It would appear that Canadian consulting engineers in Canadian cities along the coast are not allowed the same rights by the civic councils as are extended to foreign engineers. The likelihood of local men, already familiar with peculiar location, material and labor conditions, being on hand at all times with everything under constant and efficient supervision, as against a firm with headquarters elsewhere, interests elsewhere, with the mere prospect of Canadian money asserting claim to its attention a few days each month, does not appear to have much weight. This attention usually constitutes the direction of a few suggestions to the foreman on the work, and a look over surface working. Lack of patriotic pride in the progress of Canadian engineering is one thing traceable to several sources. But a strong disposition to altogether ignore already authorized successful Canadian ability is quite another issue, that should be nipped before its prevalence increases, if we would prevent the impression being created abroad that there is dearth of capable engineers in Canada to provide solutions for her engineering problems.

The Laying of Granite Paving Blocks

As a result of investigations into the subject of street paving in Chicago Mr. Samuel Whinery, consulting engineer, of Boston, Mass., has reported to the Commission on City Expenditures that the bad condition of many granite block pavements in that city is due almost wholly to the insecure foundations upon which they are laid. Since granite pavements are designed to carry the heaviest travel he states that they should always be laid upon a good concrete foundation. Where the blocks are set on any other foundation the individual blocks are likely to be forced down by the loads concentrated upon them rendering the surface uneven and causing the pavement soon to become so rough that it must be relaid. Granite blocks seldom wear out, and if they are held rigidly in place, Mr. Whinery states that the pavement will seldom need repairs. If the joints are filled with grout, as recommended by Mr. Whinery, dressing of the sides and ends of the blocks will produce joints as small as from 1/8 to 3/8 in., the present requirements in Chicago, will not be necessary. It is important, however, that the tops of the blocks forming the surface of the pavement shall be dressed to a much truer plane than is usually specified or obtained. The grout recommended is composed of equal parts of Portland cement and sand, and the joints are to be completely filled with it. The grout filling will become almost as hard as the granite itself and will not for a long time wear down below the surface of the pavement, and consequently it will remain free from the uneven surface and the roughness resulting from joints open for an inch or more below the surface of the pavement. The grout will also support the curves of the blocks so that they will retain its original comparatively smooth surface for many years. Such a pavement, it is said, will be practically indestructible and much more satisfactory in use than granite pavement as ordinarily constructed in Chicago and other cities.

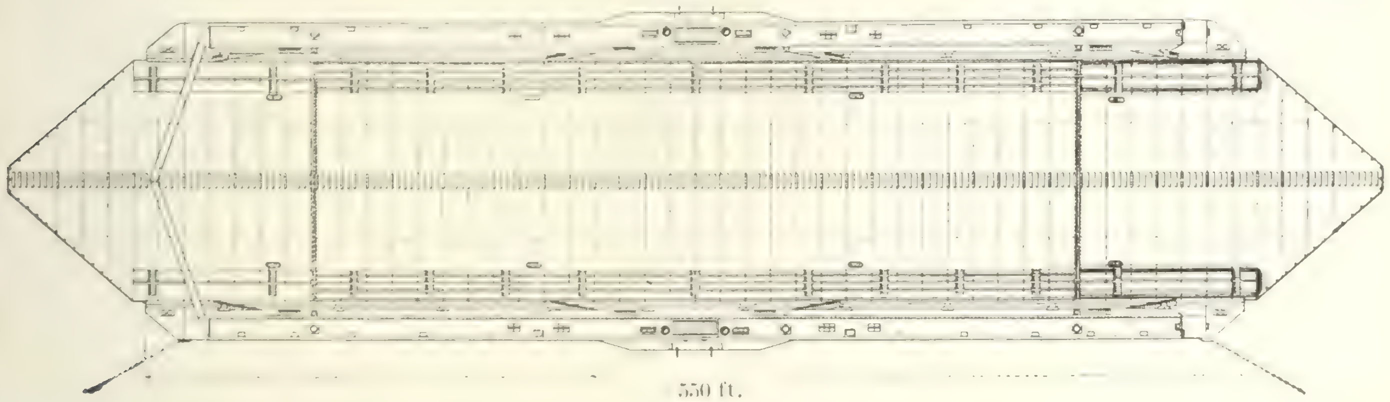
During the month of May the city of North Vancouver issued building permits to the value of 52,086. The total for the year to date is $238,959. J. W. Fugler is building inspector.

Floating Dock at North Vancouver, B. C.

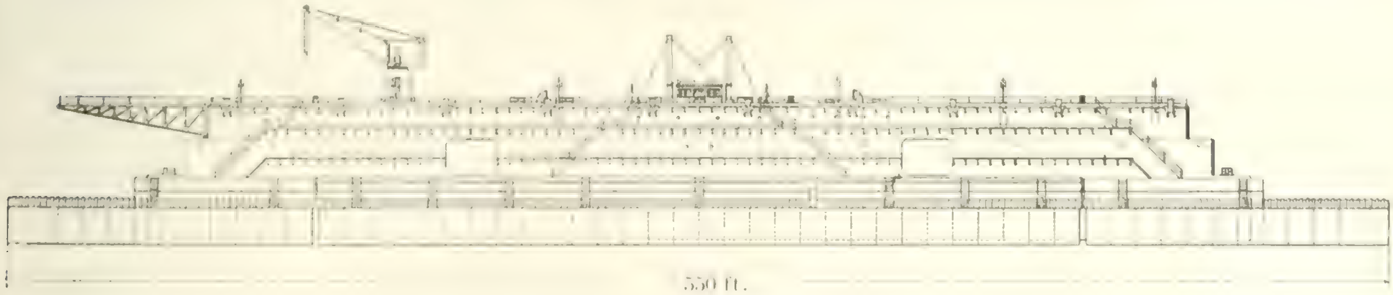
Special Features for Important Work—Floating Dock versus Graving Dock—Scheme of Mr. Nichol Thompson

Special to the Contract Record

The accompanying diagram shows the self-docking floating dock of 15,000 tons lifting capacity, now being constructed at Roche Point, North Vancouver, B. C. for the Vancouver Dry Dock and Shipbuilding Company. The dock has special features, inasmuch as it is designed as two separate docks, for the ordinary work of the coast, which can be easily and quickly connected to lift a vessel 600 feet long and weighing 15,000 tons. The cost of this great work will be $1,250,000 and an amount in excess of this has already been subscribed. The company will be able to tender on any government naval work or battleships.



The growth of shipping of the Western Pacific has been phenomenal in recent years. All the shipyards of British Columbia are busy, and the lack of docking facilities has been a great hinderance and inconvenience, especially to coastwise craft. When it was announced about a year ago that Mr. Nichol Thompson had been successful in floating his scheme to build a floating dock, few realized the magnitude of the great undertaking. Vancouver will soon have a floating dock capable of raising a vessel weighing 15,000 tons. Its length over all will be 550 feet, with 100 foot beam, and 30 feet depth over the sills. The floating dock is considered by naval engineers not to be inferior to the graving dock, which, in its simplest form, is nothing more or less than a hole dug out in the foreshore below high-tide level, with its sea end closed in by a gate or caisson. A vessel is floated into this excavation, the gate closed, and the water pumped out of this huge dug-out, so that the bottom of the vessel is rendered accessible. Now, it is evident that the interior of the graving dock must be kept dry, the sides and bottom of the excavation must be water-tight. For this reason, unless dug out in solid rock, or non-water bearing strata, the bottom or sides of the dock are usually lined with stone or brick, or in some cases with concrete or timber. But as a rule, the bottom (or invert) has more to do than this, for the whole dock, with its water-tight sides, bottom and caisson becomes a "vessel," which when empty of water, will, if the whole dock be in water-bearing ground, tend to rise up or float, just as any other vessel would do. The invert and sides must therefore be so constructed as to oppose a sufficient downward force against the upward water pressure, to prevent their rising or floating. There are several theoretical plans of construction to overcome this difficulty,—all of which are very costly. The dry dock at Esquimalt, B.C., costing some $20,000,000, may here be mentioned. But whatever the form of construction may be, the end to be obtained is always the same, and in some form or other the lining of the dock has to be made sufficiently strong to resist the upward pressure of the water.



Turning now to the "floating dock," the type soon to be built at Roche Point, Vancouver, B. C., is essentially nothing more than a great box, built of wood, iron, or any other material, which is allowed to fill with water and sink. It is then dragged under the vessel, or the vessel dragged over it. The contained water is pumped out, thereby rendering it buoyant, and if its displacement be sufficient the form rises and lifts the vessel on top of it entirely out of the water. Here no invert is necessary below the water-line, nor are heavy side walls required to hold the dock in place. The box or pontoon on which the ship rests has merely to be strong enough to carry its weight. The sides or walls, although relieving the pontoon as a girder to some extent, are really only added to regulate its descent and ascent, and to give it the necessary stability in either operation. There is, therefore, no difficulty in handling ships of deep draught on account of the great weight of invert required. All that is necessary is to make the sides or walls a trifle higher in order that a deeper draught of ship can be accommodated, without affecting the cost of the invert.

The foregoing is a digest of some remarks made by Mr. Thompson anent the floating dock compared with the graving dock, which is now being constructed in Burrard Inlet.

Concrete Best for Elevator Enclosure

Recent disastrous fires in so-called fireproof buildings have led to renewed consideration of the materials entering into their construction. Special attention is being paid to the general use of terra cotta or tile blocks for stairway and elevator inclosures, fot which they are generally used. The material is conceded to be good for this purpose, but it does not work so satisfactorily when used for mounting fire doors at the necessary openings in such shafts. W. C. Robinson, of the Underwriters' Laboratories, chairman of the committee on fire protection coverings for windows and door openings, of the National Fire Protection Association, declares as his personal opinion that tile and terra cotta blocks are not satisfactory for this purpose. He regards inclosures to vertical openings through buildings as ranking second only to fire walls in point of importance from the fire protection standpoint. Hollow building blocks often fail by the cracking away of the shells from the webs, due to the greater expansion of the shells. It is difficult to properly mount fire doors at the opening of tile and terra cotta shafts, as if structural steel is used, it is apt to expand under heat and cause failing of the tile walls. Mr. Robinson favors the use of reinforced concrete or brick with ample reinforcement properly anchored at each floor, as the materials best suited for elevator enclosures in fireproof buildings.

The Sole Arbitrator ?

Another letter appears below commenting upon the attitude City Architect McCallum takes against the Memorial of the Citizens' Committee regarding the building by-law. In it the writer does not hesitate to express his opinion of the misleading effect of the remarks that found their way into the columns of the press, and his conviction that the result of diligent research and careful study by such a competent body of engineers should bear more weight than the readers of the daily press are lead to believe. The letter is as follows:

Toronto, June 27, 1911.

Editor, Contract Record:

It is to be regretted that the City Architect has shown a disposition to deal with the Memorial for a revision of the building code of Toronto in a semi-serious, semi-popular way. The personnel of the committee should have insured better treatment than the handing out of irrevalent arguments to the daily press. Besides, he was asked for an expert opinion on the Memorial and should not have discussed the matter until he had made his report to the Fire and Light Committee.

From the press reports the City Architect appears to assume that he is to be a final arbitrator in this question of code revision. There is a difference between the making and the administrating of any law. When his report is presented if there is any divergence of opinion the question will be discussed purely on its merits. It is not expected that the City Architect's opinion will have and more weight than that of other members of the committee. The city of Toronto cannot be dominated by the opinion of any one official. The Citizens' Committee is just as anxious as the city architect to have the building code so framed as to insure substantial and safe construction. The drawing up of a new code is too serious a matter to be left to an individual and the city is fortunate in having the advice of so many of her prominent architects and engineers given to her gratis.

The committee has discussed the matter purely from a scientific and practical point of view, and was not influenced in its decision by any interests of any particular type of construction. It was for this latter reason that the building codes of American cities were not considered, as well as owing to the fact that the scissors were more prominent than the pen in the drawing up of the same.

The fact that Dr. Galbraith, Dean of the Faculty of Applied Science and Engineering of the University, and member of the late Quebec Bridge Commission, was a member of the committee alone justified the council in ordering a revision of the code. The memorial will not be ignored by the council, or the people will know the reason why.

Building and banking figures in Winnipeg continue to show enormous increases. Up to the first of June, the bank clearings amounted to $402,853,799, an increase over the first five months of 1910 of $72,092,094. Continued increase of the same proportions will place the 1911 total well over the billion mark. Building figures are not up to the wonderful record of 1910, but permits for $5,791,230 worth of new buildings have been granted since the first of January.

A contract for the erection and completion of the new court house and provincial buildings in the city of Revelstoke was awarded to Messrs. Foot & Pradelonie, contractors of Revelstoke, whose tender was the lowest in a numerous list. The contract price is understood to be in the near neighborhood of $120,000, and the successful tenderers by beginning construction immediately hope to have the building completed and ready for occupancy by the end of November.

Eleven million feet of lumber constitute an order for a single item of material, recently placed with a mill at Revelstoke by an Edmonton building corporation engaged in the erection of residential structures. Judging from the extent of this one purchase by an individual concern, and the fact that lumber is only one of the large number of materials required for work of the character, Edmonton offers a field to which supply firms can well direct their attention. In a rough way, it is estimated that it will require 400 cars to transport the shipment in question.

Sewerage System at Bridgeburg, Ont.

The Result of Recent Agitations in Industrial and Railroad Town—Trunk Sewer and Septic Tank.

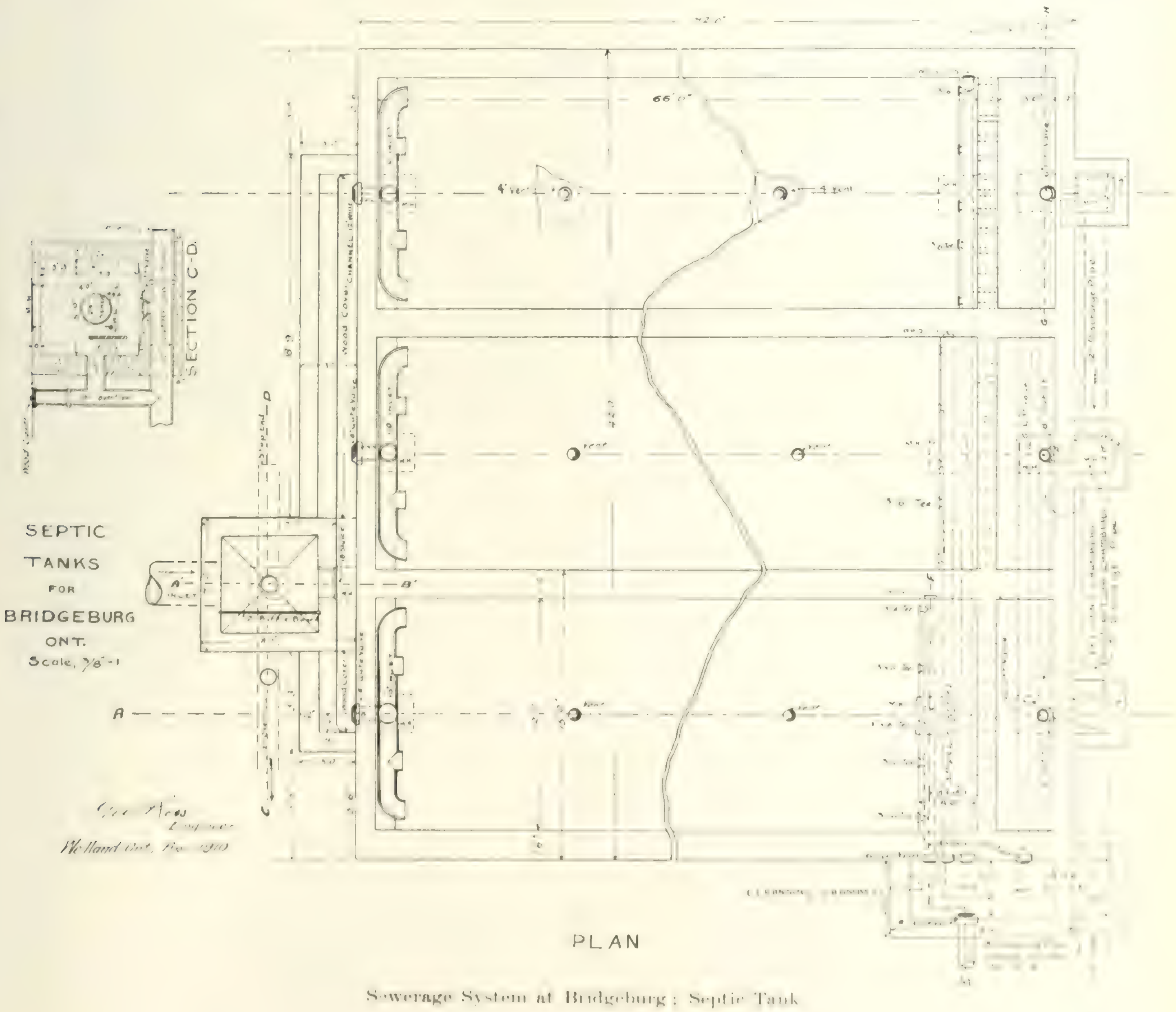
Special to the Contract Record.

The village of Bridgeburg is situated on the western bank of the Niagara river, opposite Black Rock, and is about one mile north from Lake Erie. This village is an important railroad centre, as the International Bridge, which is simply used for railway traffic spans the river here. Until a short time ago, Bridgeburg was purely a railroad town, but it is now becoming an industrial centre. Pratt and Lambert have a large varnish works in operation and there are also several branches of various classes of manufacturing works.

A few years ago a waterworks system was installed and shortly afterwards an agitation was begun for the construction of a sewerage system, and Mr. George Ross, Consulting Engineer of Welland, Ontario, was employed to make a report on a sewerage system for the whole village.

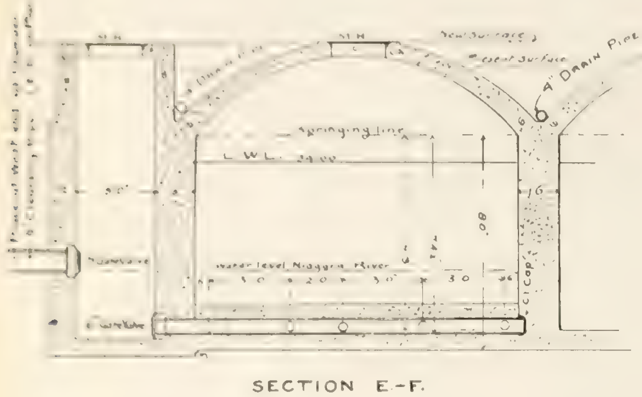
The Corporation has a frontage on the Niagara River of about a mile and extends westerly from the river somewhat over a mile and embraces within its boundaries 720 acres. Of this area about 250 acres slopes easterly to the river and the remainder slopes to the north and northwest. The portion of the Corporation sloping to the river varies from about sixteen hundred to three thousand feet in width, and the summit has a height of from thirty to about fifty feet above the water in the river.

The most closely built up section of the village is situated on the northerly part of the easterly slope, but there is also another populated district on the

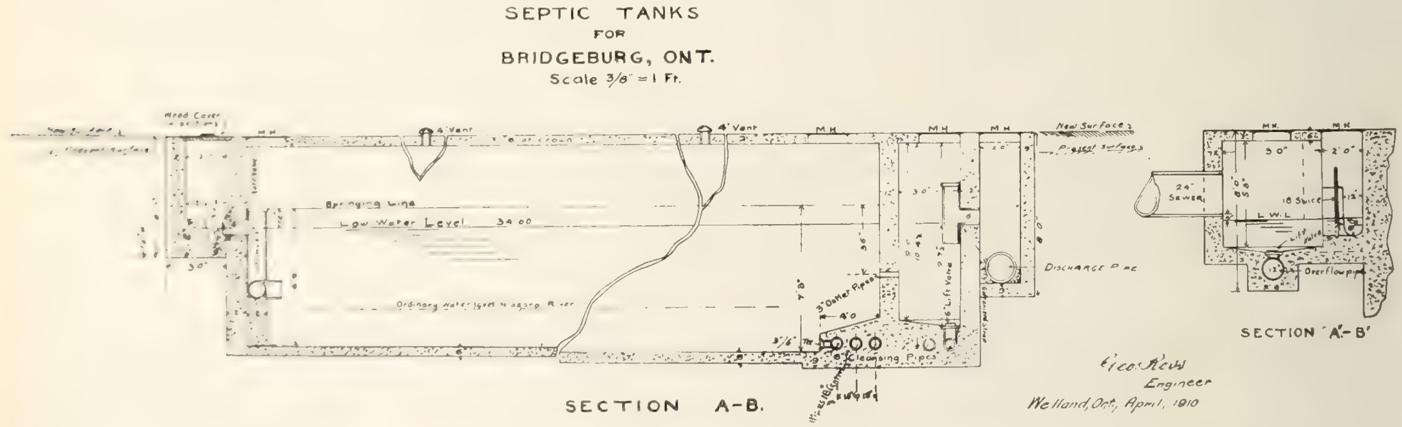


Sewerage System at Bridgeburg; Septic Tank westerly slope to be sewered to the same same outlet. The central portion of the westerly slope is mainly occupied with railroad yards, and the northwesterly portion, which slopes away from the river is unoccupied.

Mr. Ross submitted his report on a sewerage system for Bridgeburg on the 4th of April, 1907, and recommended the adoption of the separate system and proposed to construct a main sewer along the street fronting on the Niagara River, and all the sewage was to be carried to a common outlet, near the northeast corner of the corporation. This trunk sewer was to consist of about three thousand feet of 18-inch pipe and three thousand feet of 15-inch pipe; and the easterly slope, or that draining naturally to the Niagara River, was to be served with 8, 10 and 12-inch branches, and for the drainage of the westerly slope submains were to be constructed both along the northerly and southerly boundaries of the town, into which branch sewers were to lead, the intention being to convey the sewage of all these portions of the village that were likely to become populated within the next twenty years to a common outlet, a short distance below the northeast corner of the corporation where a site of five acres was to be purchased for a sewage disposal plant. The report of Mr. Ross was approved by the Provincial Board of Health and permission given to proceed with the work on the condition that a septic tank would be installed as soon as the sewers were constructed and that further purification works should be put in when required by the Board.



Cross Section E-F.; Septic Tank.



Cross Section A. B.; Septic Tank.

The entire system was to consist of about three thousand feet of 18-inch pipe, three thousand feet of 15-inch pipe, eight thousand feet of 12-inch pipe, four thousand feet of 10-inch pipe and twenty- six thousand feet of 8-inch pipe.

The report of Mr. Ross was printed and distributed among the ratepapers of the village and an agitation was kept up until in 1909 the sum of $35,000 was voted for constructing the trunk sewer and septic tank, outlet and purchasing the site of the disposal plant.

In the spring of 1910 tenders were called for the construction of the trunk sewer, septic tank and outlet and one or two branches and Mr. John F. Connolly of Toronto was awarded the contract and carried out his work in such a satisfactory manner that several branch sewers have been added to his contract, and by the end of this season nearly the whole of the populated section of the town will be sewered.

In many portions of the town a shale rock requiring to be blasted is met with, from two to eight feet below the surface, and the greater portion of the sewers were in rock excavation. Mr. Connolly's original contract amounted to the sum of about $31,000, but additions made during the past season, and to be made during the present season will more than double that amount.

The septic tank consists of a set of three chambers 12 feet wide by 66 feet in length, inside measurements. At the front of the tank there is an inlet chamber five feet by five feet clear, inside dimensions. This chamber has an eighteen-inch sluice leading to a channel or trough which runs in front of the three chambers. At the centre of each chamber is an eight inch gate valve, which may be opened so that sewage can be run into any one or all three of the chambers. After passing through the eight- inch gate valve the sewage for each chamber is led into a submerged ten-inch inlet pipe having four openings into the front of each chamber, and after passing through a chamber the effluent flows through thirteen submerged three-inch pipes into an effluent chamber three feet by twelve feet. From each effluent chamber the sewage passes to a discharge pipe at the rear of the tank, which runs to the river. The average depth of water in the tank is six feet and the bottom has a slope to the rear of six inches in length. The outlet pipe from the tank to the edge of the river is a twenty-four-inch vitrified pipe, and the outlet in the river consists of one hundred and forty-eight feet of twenty-four-inch cast iron water pipe laid in a channel excavated in the rock at the bottom of the river. The water at the outlet of this pipe is about twelve feet deep and the current, which has a velocity of five or six miles an hour, has a trend that carries the sewage away from the shore towards the centre of the river.

The septic tank is so arranged as to keep the sewage at the height of about four feet above the ordinary water level in the river, and as the depth of the sewage in the tank is about six feet, the bottom is below the river level, and as the bottom of the tank was in a shale rock in thin layers, with many seams, considerable difficulty was encountered in keeping the site of the tank free of water, while the tank was being constructed, but by laying tile drains in the bottom and leading these to a pump the water was kept down by a six-inch pump.

The tank is constructed of concrete and the longitudinal outside walls and centre walls of the tank are eighteen inches thick, and the end walls, where owing to the location of chambers, double walls come within a few feet of one another the thickness is twelve inches. The top is arched. The arches are six inches thick at the crown and nine inches at the haunches.

The total cost of the tank complete was about six thousand dollars.

The population of Bridgeburg is about sixteen hundred.

The Strength of Sheet Piling

The magnitude of the stresses in sheet piling, due to bending, depends upon the kind of material retained by it. Sheet piling is generally held in place by a wale at the top, one at or near the bottom of the excavated trench or area, and sometimes at intermediate points. In deriving the following formulas all weights are expressed in pounds per cubic foot, all distances in feet, and all bending moments in pound-feet. A vertical strip of piling 1 ft. wide is considered for the sake of convenience. Experimental investigations are being made by Prof. A. P. Mills at the College of Civil Engineering, Cornell University.

Pressure Due to Water

Let the upper wale be assumed at the water surface and the lower wale at the bottom of the excavation, or at a distance D below the surface of the water, both wales being properly braced. By the methods of mechanics the greatest bending moment is found at a distance 0.577 D below the surface, if the piling be treated as a simple beam. This point is farther from the middle of the unsupported length than in any other case where one or more additional wales are employed. The eccentricity may, however, be regarded as offset by the partial continuity of the lower end which penetrates the soil, and thus the greatest bending moment may conveniently be taken at the middle of the unsupported depth.

The value of the greatest bending moment is $3.91\ D^3$, the weight of a cubic foot of water being taken as 62.5 lbs. If an additional wale be located at a height C above the bottom one, the greatest bending moment between them is $3.91\ (2\ C^2D—C^3)$. In case both the top and the intermediate wales be omitted the bending moment at the bottom is 10.42 D. If the fluid material retained by the sheet piling is heavier than water the pressures and bending moments are proportionally increased.

Pressure Due to Dry Sand

According to Coulomb's theory the horizontal pressure (lbs. per sq. ft.) for material which assumes a slope of 1.5 to 1 is $W\ H \tan^2 (45°—\frac{1}{2}R)$, in which W is the weight per cubic foot of the material, H the depth at which the pressure occurs, and R the angle of repose expressed in degrees. This indicates that the pressure varies directly with the depth as in hydrostatic pressure, but that the unit weight of the material is $W \tan^2 (45°—\frac{1}{2} R)$ instead of W. In the material under consideration it is observed that the trench may be excavated a foot or more below the bottom of sheeting without causing any flow, and hence it may be assumed that the pressure is zero at the bottom as well as at the top.

It has been observed also that the centre of pressure against sheet piling is not at one-third of the depth from the bottom, but more nearly two-thirds of the depth (see "Earth Pressure and Bracing," by J. C. Meem, Trans. Am. Soc. C. E., Vol. 60, and the accompanying extended discussion). It seems, therefore, that the angle of repose for any given material is not constant but varies in some manner, although not directly as the depth. In conformity with these facts R may be taken equal to $90° (H/D)^{0.6}$. The exponent 0.6 is based on the result of observations.

For material having an angle of repose of 33° 40′, which corresponds to a slope of 1.5 to 1, Coulomb's formula gives a horizontal pressure equal to $0.12\ W\ D^2$, and the overturning moment about the base of $0.04\ W\ D^2$, which is claimed by Sir Benjamin Baker to be double the true value. From the results of Trautwine's experiments on overturning moment due to dry sand, it is computed to be $0.019\ W\ D^3$. By plotting the horizontal pressures derived from the values $W\ H \tan^2 [45° — 45°(H/D)^{0.6}]$ for different depths, the total pressure for dry sand is found to be $0.029\ W\ D^2$, and the centre of pressure is approximately two-thirds of the depth of the excavation from the base, making the overturning moment $0.019\ W\ D^3$, as before.

For sheet piling resisting the pressure of dry sand when held in position by wales at the top and bottom of the excavation, the greatest bending moment occurs at a distance 0.43 D from the top and equals $0.0045\ W\ D^3$. When an intermediate wale is placed at a height C above that at the bottom, the bending moment becomes $0.0045\ W\ C^2\ D$.

Pressure Due to Wet Slipping Material

There remains to be considered the wet slipping material which exerts a much greater pressure than dry sand but a smaller pressure than water. Such material produces a considerable pressure at the bottom of the excavation. To meet this condition it may be assumed that the depth at which the horizontal pressure becomes zero is 2 D instead of D. When this change is made in the previous value for horizontal pressure the results agree closely with those of observation. The total pressure above the bottom of the excavation is $0.08\ W\ D^2$, and the centre of pressure is at $\frac{1}{2}$ D. The overturning moment about the base is then $0.04\ W\ D^3$.

The greatest bending moment on sheet piling supported at the top and bottom only and retaining wet slipping material is $0.013\ W\ D^3$ and occurs at half depth. When an intermediate support is placed at a distance C above the bottom the bending movement is $0.013\ W\ C^2D$.

Work has been commenced this week in tearing down the walls of the old Guelph county jail buildings, to prepare for the erection of the new jail and jailer's residence. The building has been in use for 70 years.

Rural Highway Conditions in Manitoba

Early Progress Slow Owing to Innumerable Trails—Prairie Surface not Conductive to Concentration of Vehicle Paths. The Importance of Bridges and Culverts

Special to the Contract Record

The feeling that is abroad throughout the civilized countries of the world to-day, anent the importance of good roads to the welfare of the people of a community, is just as intense in the Province of Manitoba, at the present time, as it is in any other part of the Dominion. To be sure, it was only within the past two years that any organized effort was made by the citizens of that province, to impress upon their municipal authorities the desirability of adopting more modern and approved methods of dealing with the road question, but the enthusiasm and energy recently displayed regarding this very important part of the developing of the province will undoubtedly have the effect of elevating the standard of the roads of Manitoba to a position, compatible with the demands of the country and comparable with the advancement of its many excellent institutions.

In early days in the history of the province, it was impossible to carry out a systematic plan of road improvement. The paucity of the population of the country, and the dispersion of these residents in search of suitable homes, over wide areas, rendered very difficult indeed, any systematized effort in building up their roads. It must also be said that in many places this was not necessary. The smooth even surface of the prairie provided excellent accommodation for the intercommunication of the people and for transporting their produce to the nearest market town, and it was not until the areas were settled up and the farms fenced, thereby cutting off many of the old established trails and compelling the traffic to keep to the allowances, set aside by the Government in the survey of the country for road purposes, that the necessity of extensive road construction was made apparent. Again, before the construction of our splendid system of railways, the continuance of the importance of most of the roads to the convenience of the farmers was problematical. New lines were being built at a rapid rate, new villages and marketing places were springing up like mushrooms upon the prairies, which tended to change the direction of traffic, to increase or decrease the amount of some, and in many cases to open up new roads to more readily facilitate the movement of the products of the different communities.

Following the advent of the present system of railways which afford excellent facilities for transporting the products of the province over the long journeys to the markets of the world, arises the necessity of establishing an improved system of common roads, that will afford every means of carrying these products from the farm to the railway, with the least possible expense, with the least possible delay and with the least possible discomfort. Such are the conditions that confront the people in Manitoba today. Certain roads owing to their peculiar location have attracted a large amount of traffic upon them, and it is to these that special attention is being directed in order to establish a system of leading trunk roads, that will benefit the greatest numbers locally, and by their conjunction from a universal system throughout the whole province.

The difficulties in the way of obtaining a system of good roads as above mentioned and which will add considerably to the cost of their construction and upkeep are many. It the first place may be mentioned the lack of suitable material, such as gravel or rock at points where it can be advantageously or economically procured. This is particularly manifest in the eastern portion of the province, and it is felt there more keenly on account of the unsuitableness of the natural soil in that part to provide a road surface with even a limited amount of satisfaction. The Red River Valley soil when influenced by the action of water is perhaps as far renowned for its stickiness, as it is for its productiveness, and in order to build good roads across it, good drainage to relieve the foundation of moisture and a surface dressing of gravel or stone are absolutely necessary. Ten miles to the north east of the city of Winnipeg are large deposits of gravel, and it is from this point that a large section of the country must be supplied with that material necessitating in extreme cases a haul of fifty miles. This, of course, can only be realized by the assistance of railway companies operating there and whereby the material may be distributed at different points of vantage along their line of right-of-way in the district affected. In the western portion of the province the conditions are more amendable. The soil is not of so heavy and retentive a character, and in many places nature has been more kind in distributing useful material throughout it.

Another serious obstacle to be met with in the building of roads over a prairie country is the fewness of natural, well defined waterways or creeks and the inadequacy of some of the existing ones to properly control the water tributary to them. The importance of drainage is just as pronounced to the road on the prairie as it is to the road over any other tract of country, and to secure this, artificial outlets must be provided, if natural ones do not exist. In the past ten years about two and a quarter millions of dollars have been spent in different points throughout the country in improving the natural drainage which has facilitated the matter of road construction to a great extent, besides reclaiming immense areas of valuable low lying land. This work consisted chiefly of improving existing creeks and constructing large channels through which the water could be carried off to the larger rivers of the country. The work is conducted entirely under the Provincial Department of Public Works, and always at the solicitation of the landowners in the districts affected, who assume the full expense of the undertaking.

The cost of creating and keeping up an extensive system of good roads is presumably no greater an obstacle to their attainment in Manitoba than it is in any other part of the country, and it must be admitted that they are an expensive necessity. But it is noticeable that wherever the public is given good roads to travel upon, whenever they feel so disposed, this regard for cost decreases if kept within reasonable limits. Therefore the aim of the authorities in charge should be to endeavor to return one hundred cents worth of good substantial work for every dollar "put up" by the people. In order to secure this result, the most approved methods must be applied in carrying on the work. The most up-to-date labor-saving machines should be used wherever it is possible to do so, and the work placed under the control of men fully competent to conduct it, in every case, to a successful issue. Road building is a science and it must not be supposed that it can be acquired easily or without a great deal of study and forethought, and the sooner the road authorities cease to act as if they believed that anybody or everybody is capable of spending the funds appropriated for road building purposes, the sooner will more appreciable results be manifested from the energy and money expended in that direction.

Councillors versus Roadbuilders

In the province of Manitoba there are one hundred rural municipalities, with a population ranging from about six hundred to about five thousand in each, besides a large tract of unorganized territory. Each municipality is governed by a Reeve and four or six councillors, half the number of whom are elected for one and two years respectively. These councils have entire control of all the roads in their respective municipalities. At present the system in vogue in the greater number of these municipalities is to distribute a proportionate amount of the money raised for road purposes to each of the councillors, assigning to each the right to expend his allotted proportion in his own ward or district as he sees or wishes so to do. This is as it should not be. Because a man is elected to represent a certain district on the Municipal Council Board to assist in administering the affairs of such municipality in general, it does not follow that he is proficent in the art of road building, or capable of exacting the best returns for the money at his disposal, nor is he in many cases in a position to give a sufficiency of his time to overseeing the work, should he be practically qualified to do so.

No one should be more familiar with the needs of a district or have better knowledge of the ability of such a district to pay for these requirements, than the man elected to represent it on the council's board, but apart from that there are reasons why he should confine his efforts in this work, solely to administrative duties. The condition of many of our roads, after the large sum of money spent on them, say in the last decade, is in itself conclusive evidence that something has been amiss in the methods applied in their construction and upkeep.

It must not be inferred that the province is entirely devoid of good roads. A great deal of good work has been done in the way of effecting adequate drainage and grading up earth roads. This latter work being done in many cases by contract and with grading machines. Again, on the roads leading in to the cities and larger towns, a great deal has been done towards gravelling these and improving their standard. This is certainly a step in the right direction. The development of mechanically propelled vehicles, is to a considerable extent changing the character of the traffic on these roads, and it is only reasonable to imagine that some consideration should be given to improve the character of the road to suit this change. While we, in the province of Manitoba, are not in a position to build roads to meet the requirements of this class of traffic in full, yet it is realized that the automobile has come in the natural development of things, that they are here to stay and that roads must be built to accommodate all kinds of traffic as far as possible. Safety of travel, facility of transportation and economy in securing these desired results should be the objects sought for by those in charge. No small amount of caution and circumspection should be exercised in laying out highways for the future. Every dollar spent should be done in such a way that it will meet the requirements of traffic upon it, and that when reconstruction becomes necessary, the change may be affected with as little undoing of previous work, and thereby rendered as inexpensive as possible. It is not alone to the present requirements that we should look, but also to those with which we may have to contend in the near future.

Culverts and Bridges

Much as improved roads are needed, permanent culverts are equally needful. The function that they perform in the road that of carrying the water across it, goes to show that they are almost always situated in the lowest and wettest points along the line of right-of-way, and at points which will require special care and attention. It is not necessary that all the roads should be improved to such a high standard, but it is necessary if the roads are to be made passable at all, that good strong culverts be built upon them. The culvert in any side road will go to pieces just as fast as the one on the heavily travelled street, for it is not the traffic that in most instances destroys these structures, but the elements. Therefore, a good permanent concrete culvert is as much in place in the earth road as it is in the best class of paved boulevard. Roadmakers for years have been endeavoring to put down something in the shape of a road that will require no repairing or renewing, with but a limited amount of success, but it is possible to build these small structures, so as to entirely eliminate maintenance cost and make them everlasting. Therefore, it is a short-sighted policy to use any other material than that recognized to be most permanent. If care be taken in building these of concrete either plain or reinforced, they should last for all time, and municipal authorities should not fear being criticized, nor should they hesitate to use municipal money for permanent culverts, and if they undertook to replace all the old ones as they were worn out, and to build new ones with concrete, it would be a very short time indeed until these structures would be all permanent and energy could be turned towards some other direction. The future generation might necessarily have to help to pay for some but they would not have to build any.

The construction of bridges in Manitoba is an affair of great moment. The numerous large rivers which find their courses through the province, demand strong, substantial bridges to ensure the safety of the travelling public, using them. The large traction engines with their trailers of threshing separators and tanks, exert the greatest stress on our rural highway bridges, and these structures are designed to carry safely the heaviest in use in the province. All the drawings for important bridges are prepared for the municipal councils by the Provincial Government's engineers, who design the plans for the substructures and check all plans of superstructures submitted by bridge companies tendering on their erection.

Concrete Construction

The municipalities are now adopting concrete and masonry as the materials used for piers and abutments, and a great number of steel superstructures have been erected on these foundations in the past few years. The Provincial Government usually assists the municipalities to the extent of one-half the cost of this class of construction, when carried out according to the plans and specifications prescribed by them.

An effort is also being made by the Department of Public Works, to induce the municipal authorities to adopt reinforced concrete construction throughout for bridges up to forty or fifty feet in length, knowing that the maintenance cost and renewals on any other material of a temporary character, are not only burdensome but also vexatious. In the past season a start was made in that direction in one municipality and another is engaged at the present time in receiving tenders for four reinforced girders, to be constructed in the coming season. It is to be hoped that the completion of these will serve as an object lesson and a stimulus for other municipalities to adopt the same measure, as far as it may be possible in dealing with this class of highway bridges.

The Manitoba Good Roads Association—an organization of only about two years existence, fast gaining strength and coming into prominence, and it is to be congratulated on the public spirit and efforts displayed by its members in their endeavor to place the methods of road construction and maintenance on an up-to-date business basis, and if it succeeds in affecting the one reform of getting the management and directions of this work in each municipality under the control of a capable, responsible man, it will have accomplished something that will redound to its credit and be sufficient reason for it ever having existed. For there is no doubt but that the greatest obstacle in the way of securing—at least better roads in any country where this evil exists, is the method of assigning the actual execution of the work to elective councillors.

The Progress of Constructive Work in Ottawa

Ottawa, June 27th.

A great deal of the work on the Plaza Laurier which was to take in the Sappers Bridge and Dufferin bridge has been stopped on account of difficulties experienced in getting suitable foundations for the piers. One of the piers of the Dufferin bridge was to be utilized for the support of the plaza and another pier was to be situated just north of it. However, on digging down it was found that the foot of the Dufferin bridge pier had only one corner on rock, the remainder being on clay. While it had been sufficient for the comparatively light bridge it was not not deemed safe for the heavy concrete plaza, and it is believed that this pier will have to be taken away altogether and a new one built, going down to rock a distance of some 20 feet farther than the foot of the present pier. The foundations for the other piers were also disappointing, and clay to about 20 feet in depth was found where rock had been expected. Whether the work of building these piers can be carried on in the summer with the water in Rideau canal along side is causing uneasiness, and for this reason all this part of the work is held up until some decision is reached as to what action will be taken. It is probable that nothing will be done until the Minister of Public Works returns. As much of the operations as will not be effected by the piers is being done in the meantime. McGillivray and O'Toole are the contractors.

Construction of the Canadian Northern westward is being hurried. An overhead bridge is to be built across Bank street and will be finished as soon as possible. The company wants to haul its supplies for the big bridge across the Rideau river west of Hogsback over this line which is responsible for the activities here. The contractors had considerable difficulty getting sufficient teams for the construction.

The C. P. R. is doing considerable repairing on its Prescott line, but the erection of the new round house is help up until there is some decision regarding the tunnel.

Contractors are figuring on the new Congregational church and it is expected that the work will be begun very soon on this structure.

J. A. Ewart is preparing plans for a large factory for the Rolla Crain Limited in which will be located the company's printing plant. It will be a one-storey building covering nearly two lots. It will have a saw-tooth roof in order to give sufficient light.

Blyth and Holloway will start a factory to manufacture plumbing necessities. It will be located on Queen street in a building which will be altered for the purpose. Two or three smaller concerns are negotiating for factory sites who are at the present time in buildings that are not suitable.

V. V. Rogers has given a contract for the removal of about 40,000 cu. yds. of earth and rock in Ottawa South. It is being done by O'Leary Bros. The earth is removed about 1,000 feet for filling.

There is a great deal of residential building coming out just now mostly for people who will occupy them themselves. The high price of building lots has prevented several of the builders who construct for sale from erecting as many houses as usual this year.

The Model Homes Association will make an effort to prove that a $1,000 house can be built that will be a comfortable and attractive home for a working man. If some capitalist cannot be persuaded to take up such an undertaking the association will erect such houses itself in order to show the regular builders what can be done.

The University Gains

Mr. C. R. Young has withdrawn from the firm of Barber & Young, Bridge and Structural Engineers, in order to devote his entire time to academic work as Lecturer in Structural Engineering in the University of Toronto. The practice will be continued by Mr. Frank Barber, 57 Adelaide street East, Toronto.

The supplementary estimates recently brought down in the Dominion Parliament contain a grant of $35,000 for a survey of the proposed tunnel under the Strait of Northumberland to connect Prince Edward Island with New Brunswick. The distance between Cape Traverse on this island and Cape Tormentine in New Brunswick, the nearest approach on the mainland, is about 7 miles.

Caissons for Main Piers, Quebec Bridge

Caisson No. 1 in Place, Nos. 2 and 3 Launched—Difficulties are Many

Special to the Contract Record

Caisson No. 1 was built originally for the north main pier, but owing to difficulties met with in sinking it was decided by the Board of Engineers to use it on the south side of the river where the soil is not as hard as on the north side. (For description of the construction of this caisson see Contract Record September 7th, 1910.)

Caisson No. 1 passed the winter of 1910 in the dry dock at St. Joseph de Levis, and in April, 1911, repairs were begun to strengthen it for its trip up the river and for the sinking. The cutting edge timber which had been strained was repaired by the use of oak fish plates at the splices. The walls were filled in solid between the vertical posts with 12 in. x 12 in. timbers of Georgia pine for a height of 11 ft. above the deck. The roof of the air chamber was sheathed with yellow pine 12 in. x 6 in. and thoroughly caulked.

Caisson No. 1 being towed to bridge.

South Caisson No. 1 before placing

A false bottom was put in consisting of 32 longitudinal pine stringers 12 in. x 6 in., 180 ft. long, made up of 20-foot lengths spliced beneath each bulkhead with pine fish plates eight feet long. Each stringer was supported at three intermediate points by 6 in. x 6 in. spruce braced against the underside of the caisson roof.

The planking consisted of 3 in. spruce planed with edges slightly tapered, and was spiked directly to the stringers and thoroughly caulked.

Three boilers were installed on a platform on top of the crib work of the caisson—2 of 75 h.p., and 1 of 25 h.p. The water was supplied by two syphons extending over the side of the caisson into the river.

Five pumps were installed on the crib work, one centrifugal and four reciprocating. Four of these pumps had their suction pipes down the air shafts to draw water off the false bottom, and one was extended to pump water from the deck of the caisson in event of leakage.

About 50 tons of broken stone were placed on the deck of the caisson along the centre to trim the caisson when afloat.

Owing to the great rise and fall of the tide in this vicinity, (a miximum of 20 feet), and to the strong current and eddies at the bridge site, the plans for placing of the caisson had to be worked out in advance so that the caisson should reach the bridge site (10 miles from the dry dock) and be secured in place before the current should change.

The submerged debris of the old bridge also added a feature to the risk, together with the rocky nature of the shore, making it imperative that the caisson should not ground in which case it would probably be a total loss. At the bridge site the bed of the river had been levelled carefully to give the caisson an even bearing when it should rest in position. Timber cribs filled with stone were built to guide the caisson to its final position and a stone filled breakwater erected at the west end of the main pier to break the force of the current (see Plate No. 1). The path to be taken by the caisson was also marked out by buoys and the danger points by flags.

Placing South Caisson No. 1.

During the night of May 27th, 1911, water was let into the dry dock and the caisson floated, drawing about 10 feet of water. It was towed through the gates at 3.15 a.m. and up the river with the incoming tide. Five tugs were used, one large ocean-going wrecking tug pulling in front, and four smaller tugs used more for steering than pulling, as the large tug handled the caisson without difficulty.

The caisson was towed up the river east end first and reached Sillery at 4.30 a.m. In crossing from the north side to the south it was swung completely around into its correct position, the tide meanwhile carrying it toward the bridge site. When within about 150 yards of its correct position it was held against a very strong current by the large tug, while lines were taken ashore to the three hoisting engines anchored there, and a line from the hoisting engine on the caisson made fast on shore. Then by the aid of these four hoisting engines and three small tugs the caisson was worked, first toward the shore until it rested against the cribs and then westward until it reached its final position against the bumpers at 6.30 a.m.

Caisson No. 2 at bridge, preparing for concrete.

At low tide it rested on the level bottom in its correct position and was scuttled by large holes cut in the false bottom to prevent it floating again. The entire false bottom has recently been removed.

This caisson is 181 ft.-0 in. long x 55 ft. 6 in. wide x 44 ft. high and weighed with boilers and pumps, 2600 tons.

The caulking had been so well done that not one of the five pumps had to be used at all, in the trip up the river.

The contract for the repairing and towing of the caisson to the site was sublet to Mr. Geo. T. Davie of Levis, and the placing in charge of Mr. M. P. Davis, both of whom were present in person.

It is intended to sink this caisson during the summer far enough into the bed of the river to resist the action of the ice during the coming winter and to finally sink it farther and build the south main pier on it in the summer of 1912.

LAUNCHING OF CAISSON NO. 2 FOR WEST HALF OF NORTH MAIN PIER

The north main pier is to be built upon two caissons each 85 ft.-0 in. long, 60 ft. 0 in. wide and 55 ft. 0 in. high, placed end to end and 10 ft. apart (see Contract Record June 7th, 1911). These two caissons were begun in March 1911, and the one for the west end of the pier known as caisson No. 2, was launched on May 29th. Caisson No. 3 was launched on June 26th. As these caissons are identical in construction and launching, a description of one applies to both.

At the time of launching, caisson No. 2 was built 21 courses of wall timber above the cutting edge a total height of 23 ft. 6 in.

The verticals in place reached to about 42 feet above the wearing timber and 14 courses of cribwork had been built above the deck and bolted to it by 1½-in. round rods 16 feet long.

One ten foot length of air shafting 3 ft. diameter was in place at each of the six air shafts and pipes for water, air, electric lights and whistle signals were all in place, as well as the entire electric lighting system for the air chamber. All pipes were sealed and the shafts closed with oak doors made with pure rubber gaskets bearing against the deck.

The caisson was built level, resting on timber supports carried to concrete foundations on solid rock.

Before launching, the caisson was lowered 3 feet at the outer edge by four 350 ton jacks and blocked onto the oak cradles which slid on the lanuchways. The launchways, three in number, consisted of concrete pedestals on solid rock carrying each 3 sticks of 12 in. x 12 in. Georgia pine securely bolted to the pedestals. The grade of the launchways was 10.39 p. c. and both ways and oak cradles were greased with tallow and linseed oil to reduce the friction.

The device for holding and for starting the caisson was very ingenuous. The cradles were blocked in front by diagonal struts of oak braced against the ways and bolted to them. In the rear the cradles were held by steel chips hooked over 2 in. steel bars bearing against the back of the launchways.

For starting the caisson four 350 ton hydraulic jacks were placed beneath the cutting edge at the rear of the north side to raise it slightly and permit the foundation blocking to be removed. Behind each cradle was placed a 70 ton screw jack braced against the crib work on shore. The front braces were removed first and then at a given signal the 2 in. steel bars were knocked out simultaneously and the jacks were started. The caisson began to move almost immediately and slid slowly down the ways taking about 30 seconds to reach the water.

Caisson No. 2 being towed from Sillery to the bridge.

As it was built without a false bottom it lost the greater part of the air from the working chamber upon reaching the water. It drew 8 ft. 6 in. immediately after launching and lost all the air, settling down to a draught of 11 feet. It was taken in tow by two tugs and towed out between two cribs where it was anchored and further work was done on it.

The caisson lay at its anchorage from May 29th till June 10th when it was towed to the bridge. Sixteen additional wall timbers were added while it lay there making a total height of 39 ft. 2 in. and the cribwork was carried up to the level of the top of the wall.

The timber was floated out in rafts and handled by a derrick on a scow. The compressed air for the carpenters' augers etc. was carried out from the main plant by a two-inch pipe suspended from a steel cable.

On June 10th the Caisson was towed to the bridge by four tugs and placed in its proper position without difficulty. It drew 13 ft. and weighed about 940 tons. It is anchored by steel cables attached to "dead men" about 1,000 feet up and down stream respectively. These cables pass over six timber floats and are slackened and tightened by a hoisting engine on the wharf as the tide rises and falls.

The final building of the caisson is being done at the bridge and the placing of the concrete began on June 21st.

The concreting of the caisson and the plant at the bridge will be described in an early issue of the Contract Record. The work is in charge of Mr. J. D. Wilkens, resident engineer for the Board of Engineers. Mr. Walter M. Retner is chief engineer for contractors Messrs. M. P. & J. T. Davis.

Mistakes in Sidewalk Construction

By Jerome B. Landfield

A good proportion of all of the sidewalk work that is being done nowadays is constructed under the direction of engineers, or in accordance with specifications laid down by them. It is therefore strange that there should be such a diversity in the methods employed and in results obtained. This is a curious state of affairs, considering the extent of the work and the opportunities afforded for determining to a nicety the best possible practice.

Where there is such diversity of practice it naturally follows that in some cases it is correct and in others all wrong. There seems to be a mistaken notion that sidewalk work is not deserving of serious attention and may be properly left to the untrained man. What is true of sidewalk work is equally true of concrete curb and combined curb and gutter work. Surely this is a great mistake and municipal engineers in particular should realize that they owe it to the profession to devote sufficient attention to the subject to secure first-class results.

In this paper I desire to point out a few fallacies that have crept into sidewalk and curb and gutter work from different sources, especially those which have been sanctioned in many instances by engineers of standing.

Cinder a Poor Sub-base

Probably the most generally accepted fallacy is that of the cinder sub-base, and it is a fallacy that has cost our cities hundreds of thousands of dollars. It is probable that the fact that many are to-day specifing that a sub-base of cinders or sand should be put under a walk can be explained in this way. In the laying of flags of natural stone the under side of the flag was nearly always irregular and to dig out and shape the natural soil to fit it was a task quite out of the question. It was far easier and more practical to fill the excavation with cinders and sand, which would naturally mold itself to fit the configuration of the under side of the stone. What was more natural than to continue the same practice when concrete walks came to be laid, and to set up the argument that this sub-base ensured good drainage and was a safeguard against heaving due to frost?

This sounded perfectly plausible. In fact, I presume that a large portion of those who read this article will regard the views expressed in it as heretical. But the following fact appears pertinent. If one lifts a good-sized flat stone from its resting place in a field in the winter time he will notice that there is rarely to be found beneath it any frozen ground, while all around are evidences of frost. The reason is that, first of all, the natural soil that forms its bed is tightly packed so as to make a snug resting place that did not admit water readily, and, next, that the stone itself under these conditions affords good protection.

Now consider for a moment the concrete sidewalk. In constructing this, first the natural soil is removed whether it be clay, gravel or hardpan, making a trench that becomes the finest kind of reservoir to collect moisture. This trench is then filled with porous material that never becomes as compact as the original soil, but which absorbs and holds moisture like a sponge. Even if tile is placed in the bottom of this trench, this does not make the sub-base any the less a sponge. Four or five inches of concrete would have protected the compacted natural soil that would hug it so closely as scarcely to admit any water, but severe cold is very liable to freeze the cinder foundation in spite of the concrete. These are some of the considerations that lead me to believe that the cinder sub-base is useless and detrimental, even when carefully drained with tiles, and extended practice bears this out.

Water Should be Carefully Gauged

Another fallacy that is very prevalent, but which is happily growing less, is the idea that a sloppy top-coat is good practice. Somehow or other many concrete men have got the notion that in sidewalk work the wetter the mix the better. They argue from experience in other kinds of work where they find that poured concrete makes a dense mass and reduces the voids, and do not take into account the points wherein the conditions differ. Let us consider just what the conditions of sidewalk work are and how they affect the question of how much water to use.

In sidewalk work water-tight molds are not used in which to form the blocks. The mass dealt with is thin and has two large surfaces, one of which is exposed to the absorbant action of the ground beneath, and the other to the drying action of the air. If, therefore, too much water is put into the concrete there is a tendency for it to drain away and carry with it particles of cement washed from the aggregate. If less water were used and the mass well mixed, the whole amount of water would be closely engaged with the cement. In warm climates it is frequently argued that more water should be used in order that the surface may not dry out too rapidly. But here we have also a fallacy. If there is more water at the surface than is needed for the setting of the cement, there is almost certain to have been flushed to the surface considerable neat cement and as the surplus water evaporates the foundation is laid for hair-cracks. The correct way is to use the proper amount of water and then protect the surface against the heat.

The lower course should have just enough water so that it will not quake when tamped. The top-coat should be mixed stiff enough so that you can mold it in the hand and it should be put on while the lower course is fresh and green. Then tamp it lightly, remove the surplus material by striking it off, and finish immediately with a wooden float. The tamping of the top-coat is of great importance for fine work and it really does not add to the expense, as it simplifies finishing. The first effect is to make the top-course dense and to bond it mechanically to the base. The moisture is distributed evenly throughout the mass and enough is gently flushed to the surface for immediate finishing. Where the top-coat is put on as wet as mortar, or sloppy, the amount of moisture in upper and lower courses differs, and consequently the change in volume while setting is in different ratios. This is a fruitful source of checking.

There is one more cogent reason why the top-coat should never be put on sloppy. Sidewalks differ from some other kinds of concrete work in that the surface has to be finished by manipulation. If the finished surface is to be durable it should be finished as soon as possible. Now if the concrete is too wet the finisher stands around half an hour or so waiting for the surface to dry out enough for him to do his work. If he starts to use his trowel while it is too wet he flushes neat cement to the surface and this, being the softest part of the mass, makes a scale that wears away easily if it does not flake off. If, on the other hand, he waits until the surface is just plastic enough he is bound to disturb particles that have begun to set and which for the sake of strength and durability should have been left untouched in their original positions. Is it not strange that in view of these simple facts, easily demonstrated in practice, the big city of Chicago should specify a sloppy top-coat for her sidewalk work?

Removal of Forms

A number of other minor fallacies in sidewalk work might be pointed out, but they are mainly local and not widespread. One of these, however, which I desire to refer to is the notion that it is necessary to leave the forms in place in sidewalk work until the concrete has set. There is no special objection to this, except that persistence in the idea may prevent a contractor from adopting some of the modern styles of forms, which are usually of steel and more expensive than the old wooden forms, and the outlay for which is reduced if each section of form be used more frequently. Experience during the past few years with this style of form has shown this to be practicable without any detriment to the pavement.

Subsurface Structures ?*

In considering the subject of street widths and their subdivisions, the necessity for providing ample space to accommodate the substructures needed to meet the requirements of modern city life cannot be overlooked. Underground circulation is as necessary to modern municipal life as surface circulation, and the problems involved in its installation and maintenance have become exceedingly complex and difficult as the demand for such service is increased. Surface traffic may be shifted entirely off of a street temporarily, in cases of emergency, without inflicting any great hardship, but the underground service, once installed, becomes permanent, and any derangement or interference with it often seriously affects large areas.

The great tendency in all our large cities, especially in America, to concentrate business activities at some central location (to create civic centres) h demonstrated the total inadequacy of the street su face to supply space to meet the problems of pa senger transportation. It is therefore essential plan in all our large cities to carry the thousands people who daily congregate for business or pleasu over railway lines constructed either above or bel the street surface. The space required for the fou dations to support elevated roads, or the area of t street cross section necessary for subways. in ad tion to the sewers, water and gas pipes, telegraph a telephone conduits, pneumatic tubes, pipes for t conveyance of steam, hot water or refrigerating co pounds, vaults and tunnels, cannot be found exce in streets of considerable width.

The substructure congestion occurs not only the business districts but also along the lines of a main arteries of travel leading from the heart of th city to local centres of manufacturing or business i terests. In the central and older portions of the cit of Philadelphia many of the streets in the regula system are but 50 feet wide, with a few diagonal a enues 60 feet wide. The widths of these streets ar inefficient not only for surface travel but also for th substructures which must be placed in them. Thi congestion is intensified at the street intersections.

In the replanning of these portions of the city i is found necessary not only to provide for widenin existing highways but also to lay out and open addi tional avenues and to enlarge intersections to mee the demands for subsurface structures as well a for surface uses. This increase in street width ha been gradually accomplished on Chestnut and Wal nut streets, in the business section, by placing the streets upon the official plan of 10 feet greater widt and requiring all new buildings to recede to the new line, paying to the owner at the time of construction any damages that may be sustained. By this method the cost is not burdensome to the city. The widths of a number of important diagonal avenues leading through local business centres are being increased in like manner.

In the growth of a modern city the number and character of underground structures is constantly increasing and changing, and it is probable that the future will see the present ones supplemented by others for purposes now scarcely thought of. This ever increasing demand for space under the street surface makes it therefore necessary that the available cross section be utilized to the best possible advantage. This in a measure can be accomplished, as it is in the city of Philadelphia, by grouping the structures as closely together as possible, but a much better method would be by the construction of one or more lines of subsurface galleries, of sufficient size to accommodate all future structures, preferably one on each side of the street, close to the curb line, thus doing away with the usual form of conduit construction and avoiding the necessity of continually opening the street surface and interfering with the proper maintenance of paved areas. Such galleries might, when old streets are widened or new avenues opened in the built up portion of the city, be advantageously constructed and maintained by the municipality and at least a portion of the cost covered by rental charges to public service companies which should be required by law to place their structures in them and to pay a proper rental therefor.

The prevailing custom in many cities of allowing vaults to be constructed under the sidewalks of the et and extending to the surface, results in the oc- tion of a large percentage of the available cross on of the street and interferes seriously with the ng of other underground structures. The dis- ntage of allowing construction of this kind is now g realized in many of our cities, and such con- ctions wholly prohibited on main thoroughfares. e 1902 it has been unlawful in Philadelphia to truct or reconstruct any vault under the sidewalks e streets unless the outside top of the vault shall t least 4 feet below the established grade of the walk over the same, the purpose being to reserve 4 feet of space for conduit and tube construction. persons receiving permits to construct vaults are ired to enter into agreement that the city shall in ase be liable for any claim for damages for the cupation and use of the whole street or any part eof to the house line, for public purposes.

---

*Paper presented by G. S. Webster at the third National conference on city planning, Philadelphia.

n the case of Philadelphia the location of under- und structures of every character is determined by ard of highway supervisors composed of the chief ers of the various bureaus of the city government ng charge of the municipal and underground tures. This board is vested with the full power, nly to grant original locations to companies orized by law to lay pipes and conduits, but also lirect their removal and relocation whenever the lic good demands it.

or the purpose of enabling the board to act in- gently upon all applications, a recording and ting department is maintained where all under- und structures are plotted and their sizes, depths distances from the curb or building lines, shown n plans of uniform size drawn to a scale of 20 to the inch. Each structure is colored with a con- onal tint so that it may be readily followed on plan. All applicants for permits to locate pipes, duits or other subsurface structures are required btain plans from the department records showing, far as practicable, all existing structures in the et, also the location which they desire to occupy. harge per linear foot is made by the city for such ns and information, and the cash receipts are con- rably more than the amount necessary to maintain force in the drafting room and the field inspectors are sent to see that the locations granted are fol- ed, and to systematically make measurements of report all structures of every character met with he excavation. By this means the plans are con- ntly being checked and where necessary corrected. all cases where electrical conduits are laid by pub- service corporations, the law requires that one duit shall be provided and laid at the expense of company for the use of the city.

No Canadians Need Apply

At a meeting of the Victoria, B. C., city council on dnesday, June 7th, a discussion on the appointment of a sulting engineer for the Sooke Lake Waterworks pro- , for that city, took place.

The appointment was given to a San Francisco engin and amongst other remarks the mayor stated that nadian engineers fail to get out and rustle for positions canvassing, as the American engineers do, but seem think they should sit in their offices and be run after accept appointments

A few moments later an alderman asked the mayor state whether he had in his capacity as mayor, received a letter from the secretary of the Vancouver branch of the Canadian Society of Civil Engineers, in March last, asking that Canadian engineers be given consideration in appointments for engineering work at the disposal of the city council. His Worship acknowledged having received the communication, but indignantly claimed that he was not bound to submit it to the council and had not done so, as the communication was addressed to the mayor. He further went out of his way to say he wanted understood that neither he nor the council meant to be dictated to by any engineering institution, as to whom the council should employ, Canadian or American, which uncalled for remark led an alderman to point out that the letter, a copy of which was then reproduced and read to the council, was simply a respectful request for fair consideration of engineers in Canada and was not dictatorial nor otherwise of offensive nature.

The judgment of a majority of the council was that the interest of the city would be served by engagement of the San Francisco applicant in preference to employing a Canadian firm whose application was the only other one brought before the meeting.

Having but a few days previously learned of the council's desire to engage a consulting hydraulic engineer, the writer proceeded to Victoria and called upon the mayor some hours before the council meeting above referred to, and stated that if the council were not committed to engagement of the American applicant, as it seemed might be the case, he would be glad to receive consideration in the matter and would feel perfectly satisfied to be judged solely upon his merits from the standpoint of professional ability, experience, and fitness, aside from the fact of his being a Canadian practising in the Province.

His Worship distinctly informed the writer, in reply, that his application, if submitted to council, would be considered only on condition that the application of the San Francisco engineer were rejected by council, at the meeting to be held that evening.

From the time of suppressing the letter of the Canadian Society of Civil Engineers, in March, until the appointment of the United States engineer on the 7th of June, Mayor Morley's disposition and inconsistencies indicate an aversion on his part, to even hearing of a Canadian whose merits would entitle him to the position, as against his American friend.

In times past, when Canadian engineers of recognized ability, were for the most part, located far east from the Pacific coast, and when United States engineers were available from the adjacent States, and perhaps in certain cases, more experienced with Pacific Coast conditions, there may have been some reason for looking to the Pacific States for professional services in preference to seeking Canadians more remote; but in these days the action of the mayor of Victoria looks positively disloyal and probably as much so to the good people of Victoria and British Columbia themselves, were the conditions fully understood, as to Canadians in general.

Waterproofing a concrete roof has been done successfully by Mr. J. R. Bayliss with a half-inch coat of 1:2 mortar, applied before the concrete had set and troweled smooth. A solution of 1 lb. of concentrated lye and 5 lb. of alum was made up with 2 gallons of water, and used by diluting one part of it with 30 parts of water. A mixture of 2 lb of cement in a pint of this diluted solution was applied in two coats to the fresh mortar. A large reinforced concrete pipe was also waterproofed in much the same manner and has likewise remained tight for several [illegible]

Bascule Bridge Over Canal at Lindsay

This bridge was recently erected over the Trent Valley Canal on Wellington street in the Town of Lindsay, Ont. The structure is known as a Strauss Trunnion Bascule bridge embracing a 73-ft. deck plate girder moveable or lift span, the main girders of which are supported through the trunnions on two pairs of trunnion posts. It further includes a reinforced concrete counterweight supported by steel columns or legs which are pin connected to the tail ends of the main girder and also the counterweight link, the counterweight tower and the 25 ft. 6 in. tower span supporting the tower.

The machinery embraces a train of gears actuating two operating pinions, one for each main girder and each engaging a segmental rack bolted to the tail ends of the girders and which are hereafter described.

It will be seen that this bridge is radically different from the ordinary structure carrying highway traffic over canals or rivers, and it is (so far as known), the first bascule bridge erected in Canada, although at the present time there are several in course of construction. The bridge consists as already stated of a 73-ft. lifting arm and which is raised and lowered with gears operated either by hand power or electric power, the electric power being used at all times and the hand power arranged for emergency cases. The structure itself is the ordinary type of plate girder with special ends on which are placed racks operating with gears and other machinery placed under the end of the bridge. The amount of power required for operating this structure is comparatively small as the large heavy reinforced concrete counterweight block is intended to practically counterbalance the weight of the lifting span, and the weight of this block is a few hundred pounds less than the weight of the structure itself and when power is applied, it merely overcomes this difference in weight.

The quality of material and the class of workmanship are of the very highest quality and all the conditions of the Dominion Government specifications were rigidly carried out, the work being inspected at all stages of shop and erection work.

The floor of the bridge consists of timber and the guard rails on each side are formed of steel lattice fences of the usual type.

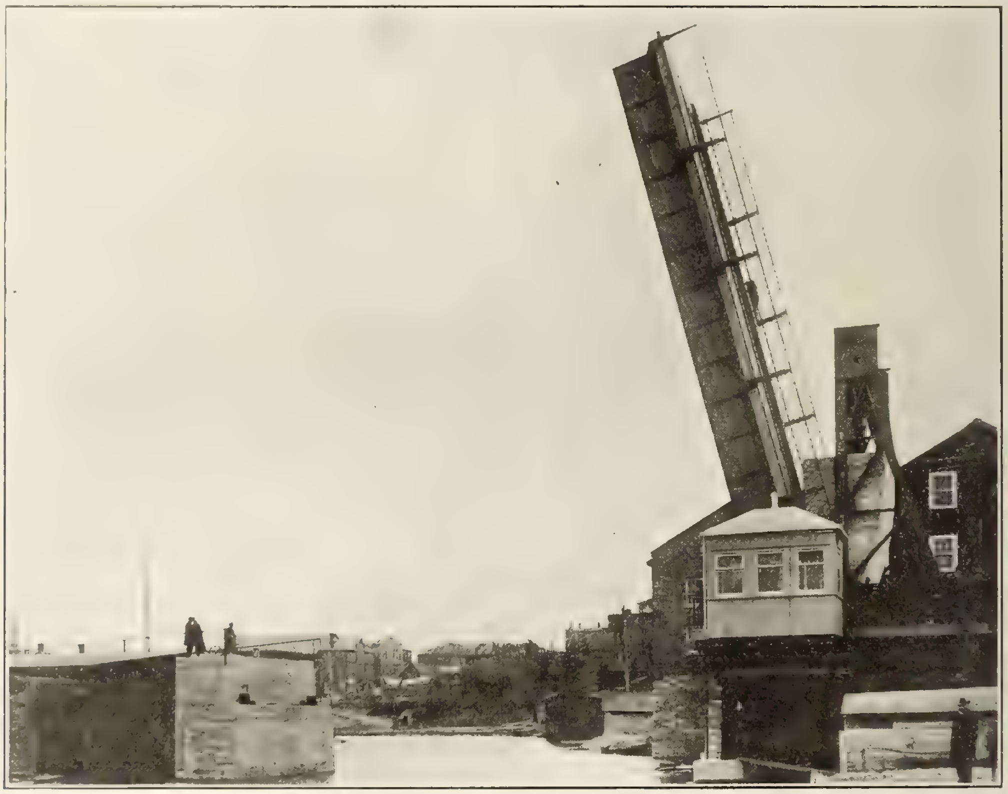
Fig 1 shows the lifting leaf of the bridge open and the concrete counterweight at its lowest point.

Fig. 2 shows the lifting gear of the bridge closed to accommodate vehicle traffic over the canal and it will be noted the concrete counterweight is at its highest point.

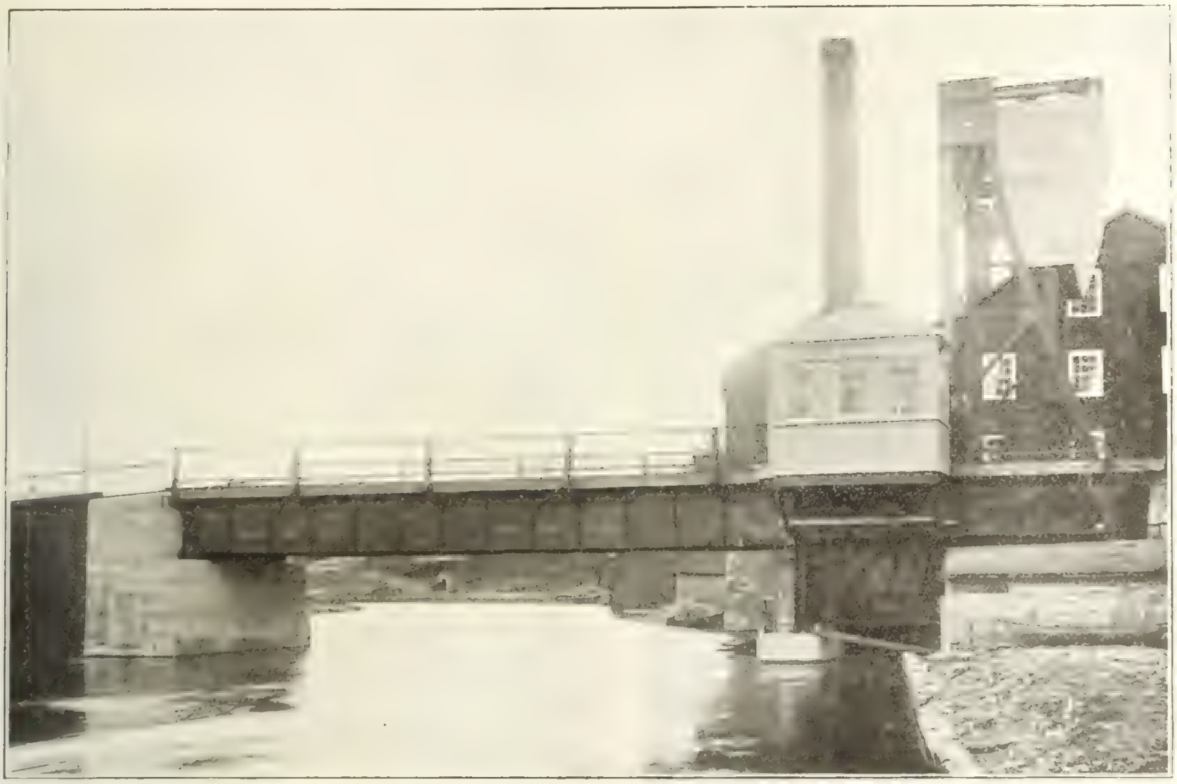
Fig. 3 is an end view of the bridge showing it closed and the concrete counterweight at its highest point.

On this bridge being tested by the representatives of the government and the manufacturers, it was found to work very satisfactorily indeed, very slight adjustment being required to put it in perfect working order.

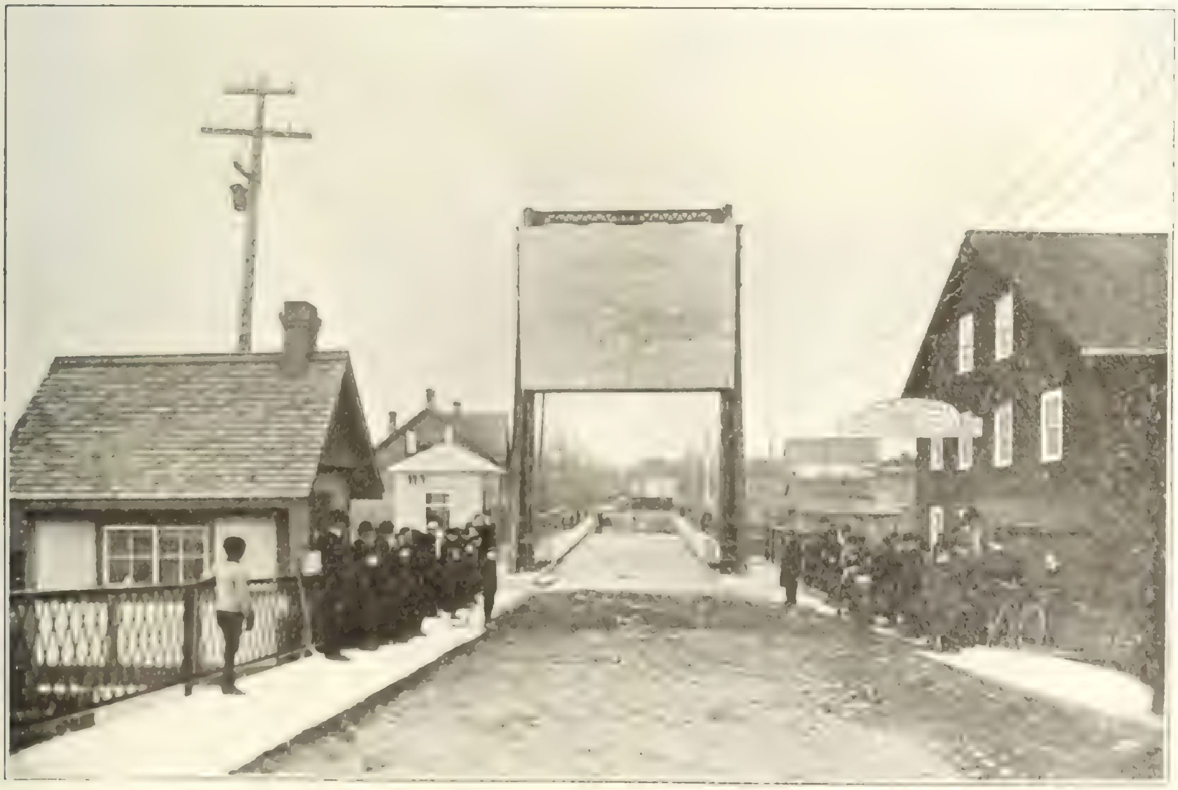
This bridge was built for the Department of Railways and Canals, A. J. Grant, C. E., of Peterboro, being the superintending engineer. The designers of the bridge were the Strauss Bascule & Concrete Bridge Company of Chicago, Ill., and the contractors and builders of the steel superstructure including all structural steel, machinery, concrete counterweight, operator's cabin, etc., were the Hamilton Bridge Works Company, Limited, of Hamilton, Canada.



Lindsay Bridge; lifting leaf open.



Lindsay Bridge; lifting leaf closed, counterweight at top.

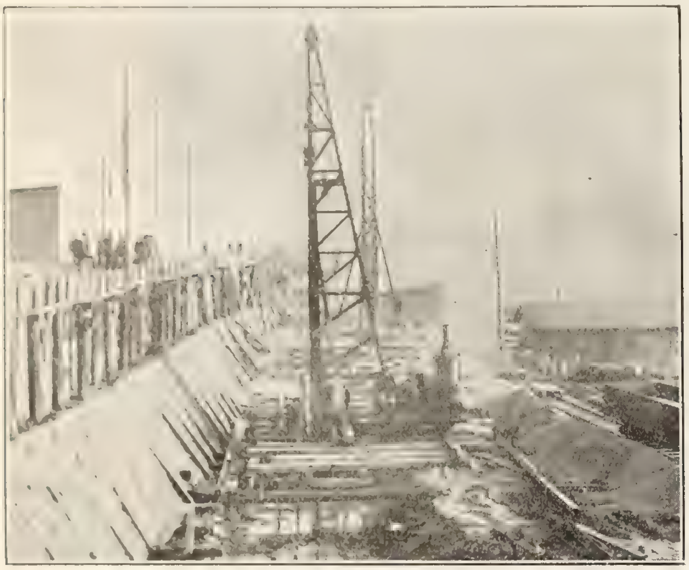


Lindsay Bridge; end view, lifting leaf closed.

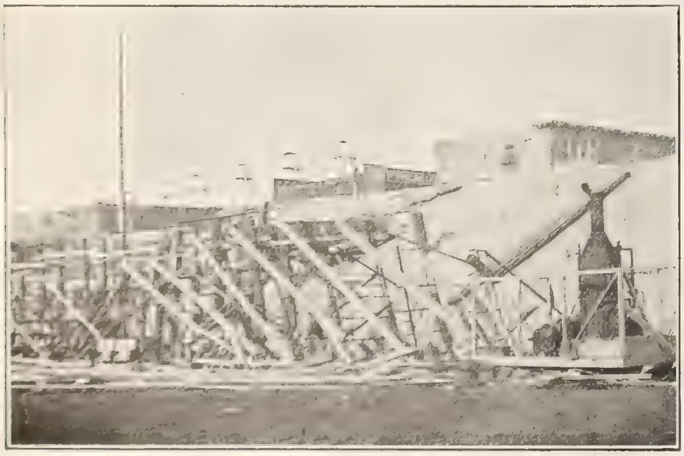
Foundations for Retaining Wall at Seattle

In connection with the terminal improvements at Seattle, for the Oregon & Washington R. R., among which is a passenger station 115 x 185 ft. and 5 storeys in height, a passenger yard embracing 12 tracks of a capacity of 122 cars, some interesting features are to be noted in connection with the retaining wall running along 5th Avenue for 1,681 feet.

The level of the passenger yard and the track floor of the building is 24½ ft. below the grade of the adjoining street. The two streets which cross the passenger terminal are to be carried on overhead bridges or viaducts; one of them being in front of the station, the other near the end of the yard. Additional track room will be supplied by carrying part of the yard under the sidewalk at the 5th Avenue side, the walk being carried by a cantilever construction.


General work of construction, showing pile drivers

At this side of the yard (the 5th Avenue side), the bank will be retained by a wall of a maximum height of 50 feet and 1,681 ft. long, which will also serve to carry one edge of the viaduct roadway platform 16 ft. wide, mentioned above, the outer edge of the platform being supported by columns. Between the row of columns and the base of the retaining wall, one of the tracks is to be located.

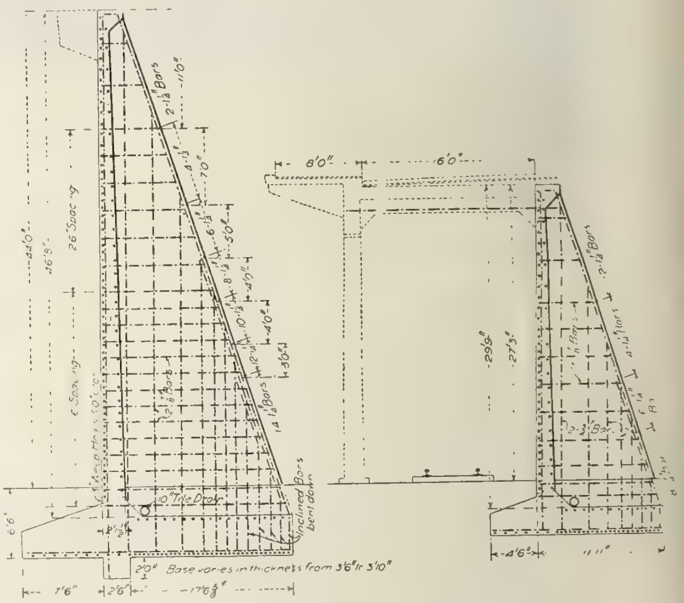

The erection of reinforcement for retaining walls

The reinforced concrete retaining wall is triangular shaped in sections as shown in Figures 1 and 3. Figure 1 shows part of the reinforcing set in place, previous to the erection of the wooden forms. The reinforcing consists of vertical and horizontal continuous webs, connected by transverse webs or counterforts 10 ft. apart.

The horizontal web or footing is supported on two and three rows of pedestal concrete piles, about three feet apart in both directions under the vertical web, with additional transverse rows of concrete piles under the counterforts.

The soil here consists of a soft mud fill about 35 ft. in depth overlying an old gravel beach with water line about 10 ft. below the original surface of the ground.

The pedestal concrete piles were formed by driving first a core fitting into a casing (the lower and pointed end of the core projecting several feet below the lower end of the casing) by two No. 2 Vulcan steam hammers in leads 65 ft. long. The core and casing were driven to an average depth of about 35 ft. The core was withdrawn and a small batch of 1-2-4 concrete, made with superior Portland cement and gravel, was dropped to the bottom of the casing. This was then bulged out by lowering the core down again into the casing and tapping it lightly. The operation was then repeated a number of times so that a footing at the bottom of the casing about 3 ft. in diameter, and spreading out on the sand beach below the subsoil was obtained. The casing was then filled up with wet concrete and withdrawn.



Construction of retaining wall and bridge with cantilever sidewalk

About 2,000 concrete piles of this kind were formed. Three of the piles were selected at random and subjected to a test of 135 tons for 24 hours producing no settlement.

Reinforcing of ⅝-inch steel rods, 15 ft. long were used for the upper part of the pile columns in order to provide against lateral pressure of the earth retained.

These rods were pushed into the concrete after it had been placed, and being done carefully by hand, all possibility of the bars being exposed on the surface was eliminated. Messrs. Grant, Smith & Co., of Seattle were the general contractors for this work, the MacArthur Concrete Pile & Foundation Co., of New York, being the contractors for the pedestal concrete pile foundations.

Tenders have been called for by Messrs. Saxe & Archibald, architects, Beaver Hall Hill, Montreal, for a new residence to be erected on Cote street, Antoine Road, Westmount, for Mr. A. A. Ayer, at a cost of about $15,000.

Canadian City Engineers

Frank Chappell, Oshawa, Ont.

Frank Chappell, town engineer of Oshawa, Ont., is a native of Cardiff, Wales. After completing a five years' apprenticeship course in the workshop and offices of the Mercantile Pontoon Company, ship builders and repairers, of Cardiff, and winning a scholarship, he began a course of study in 1904 in civil and municipal engineering at the University of South Wales, from which he graduated in 1907. Coming to Canada at this period, he entered the employ of the Grand Trunk Railway Company at Montreal. In 1908 he attended McGill University, Department of Surveying, and later he took up post graduate work in municipal engineering at McGill. After completing this course he engaged in work in a private capacity until appointed in June, 1909, town engineer and superintendent of waterworks at Oshawa, Ont.

In this capacity he superintended the consturction by day labor of some 5,800 feet of main sanitary sewers and 4,500 feet of water main extension. In addition, some 12,000 feet of concrete sidewalk has been laid by contract. Approximately 3,500 feet of asphalt block pavement is to be laid by contract this year. The work of designing and laying out a system of sewage disposal is proceeding as rapidly as possible. It is Mr. Chappell's opinion, gained through experience, that day labor may readily compete with contract labor in the majority of cases where there is an efficient permanent staff. Where this staff is confined to the resident engineer, however, and to one or two foremen who may not be permanently employed, and where the labor at hand is of the crude description common to most small towns, Mr. Chappell considers it next to hopeless to think of competing with the skilled organization it is possible for a capable contractor to bring to bear upon the work.

Frank Chappell, of Oshawa, Ont.

The waterworks system of Oshawa is in a most flourishing condition. Last year it was able to hand over to the town $3,500 after paying out of its revenue all operating, constructional, and current expenses.

Trade Notes and Items of Interest

About 20 miles of pavements are being laid in Regina this season. One-half the work has already been completed.

The Engineer's Club of Toronto has secured an option on the Saturday Night Building and intends to purchase it for club purposes.

Paquette & Sons, of Sherbrooke, Que., were recently awarded the contract for the painting of the iron bridges in that city.

Mr. Gustav Lindenthal, of New York, has received the degree of Doctor of Engineering from the Royal Technical Institute of Dresden.

The fourth annual general assembly of the Royal Architectural Institute of Canada will be held at Montreal on the 3rd and 4th of October.

Walter J. Francis, C.E., consulting engineer, of Montreal, has submitted his report to the Moose Jaw city council in the question of its water supply.

Mr. Geo. Bury, general manager of western lines for the C. P. R., has announced the intention of the company to enlarge the railway station at Vancouver.

Work will be commenced immediately at Wilmer, B.C., for supplying the town with water. All the contracts for piping, connections, etc., have been awarded.

C. F. Gibson, until recently town engineer of Sturgeon Falls, Ontario, has secured the contract for laying the cement walks for the town of Campbellford.

E. B. Jones has resigned his position as city engineer of Chatham, Ont. The city council propose appointing a foreman of public works to run the department until next spring.

The Calgary Street Railway extensions are nearing completion and more than ten miles of new track will be in service by July 1, barely three months after work was begun on these extensions.

The Commission of Conservation has received formal protest from the Selkirk Board of Trade against the proposal of the city of Winnipeg to construct a sewer through Kildonian to the Red River.

Calgary building figures for May exceed those of any other Canadian city, having a monthly total of $3,700,000. The Hudson's Bay store and the new St. George Hotel are big items in the city's May record.

Mr. C. A. Jennings, superintendent of the Bubbly Creek filter plant at the Chicago Stockyards, has been selected to instal several hypochlorite-of-lime plants for water supplies on the Pacific coast.

Saskatoon, Sask., building permits for the first two weeks of the month of June totalled nearly $275,000. This is about $100,000 in excess of the amount for the entire month of June last year.

Work will shortly be started on a new steel arch bridge over Niagara Falls, to replace the present cantilever bridge, it being regarded as too small to accommodate the increased heavy traffic.

Mr. Phillips B. Motley has been appointed engineer of bridges of the Canadian Pacific Railway. He became connected with that road in 1902, when he first entered railway service and has been engaged in various department of its bridge and structural work.

William Dicken, Fernie, B.C., has been engaged by the city of Medicine Hat to supervise the manufacture of concrete pipe for this season's work. Mr. Dicken has recently completed a contract for the supply of a large quantity of concrete pipe for the city of Fernie, B.C.

Superintendent Lesage of the water department of Montreal, has reported upon the enlargement of the aqueduct which runs from Point St. Charles to Lachine Rapids. The improvement means that the city will have at its disposal about 100,000,000 gallons of water per day.

Mr. A. H. Blanchard, Mem. Am. Soc. C.E., Associate Professor of Civil Engineering at Brown University, has resigned to accept the appointment of Professor of Highway Engineering at Columbia University. Mr. Blanchard will have charge of the graduate courses in highway engineering which are to be established there in the fall.

To more fully overtake the unprecedented demand for their locomotives, The Canadian Locomotive Company of Kingston, have decided to double the capacity of their plant, thus enabling it to turn out at least 150 locomotives per year. They also own sufficient land to enable them to still further increase their capacity, should business warrant it.

Montreal will soon have a valuable addition to its list of commercial structures in the form of an office building on Phillips Square, for Messrs. Henry Birks & Sons, Limited, the plans for which have been prepared by Messrs. Nobbs & Hyde, architects. Located on the south-westerly corner of the square the site is one of the finest in the city.

Plans have been submitted to the public works department at Ottawa for the establishment of a new waterway between Montreal, Lake Champlain and Quebec. A 12-foot waterway is proposed and the work will involve the complete construction of 21 miles of new canal. It is estimated that the cost of the work will amount to millions of dollars.

Plans for the improvement to the harbor at Port Stanley, Ont., have been forwarded to Ottawa. The sum of $60,000 has been set aside for this work. The breakwater will be of the most modern construction. It is expected that the work will be completed this summer and when finished a new pier for unloading vessels will be built.

James D. McGregor, financier, representing British capitalists, states that engineers of the principals he represents will be in Brandon this week to report on the street railway proposition. On receipt of their report the syndicate will lay a proposition before the city for securing a franchise for the system. This system, as adopted by city, calls for about seven miles of track with car barns and overhead work.

Messrs. E. & W. S. Maxwell, architects of Montreal, have prepared plans for the St. Paul's hospital to be erected in Saskatoon for the order of nuns. Tenders will be called for shortly for the excavation and foundation work which is to be completed this fall. Work on the superstructure will be taken up in the spring and if possible completed during the following season. The building will be of concrete and brick practically fire proof and is expected to cost about $150,000. The main part of the building will contain the administrative and operating departments with private and semi-private wards. Two wings will afterwards be added when the requirements call for them. The sisters already have a building close to the site of the new hospital. The different buildings will be connected by covered passageways. Mr. Fortin of Regina represents Messrs. Maxwell and will superintend the erection of the new building.

Railway Construction in Saskatchewan

Saskatchewan is witnessing to-day the greatest railway development any section of the world has ever known. Over one thousand miles of new railway track wil be constructed in Saskatchewan this year. Last year Saskatchewan led all the provinces in the Dominion, with a total of 475 miles. The Canadian Northern Railway is constructing 330 miles; the Grand Trunk Pacific is constructing 340 miles; the Canadian Pacific Railway is constructing 348 miles. The longest single stretch of railway being constructed is 100 miles. About 1,300 miles of new grading will be done this year. Total construction for this year is almost one-half as great as in the preceding five years. At the end of the year there will be 4,752 miles of track in Saskatchewan.

According to the newest information obtainable, the following list of lines will be constructed by the various railways this year, unless something compels the railways to change their plans:

By the Canadian Northern—Aylesbury westward to Davidson, 15 miles; Battleford-Jackfish line, 40 miles, to be laid; Thunderhill extension, 70 miles west of Manitoba; Delisle branch from Goose Lake line, 35 miles; Moose Jaw southeast, 100 miles; Roseburn extension, 20 miles; Shelbrook line, 50 miles. This makes a total of Canadian Northern Railway construction of 330 miles this year.

By the Grand Trunk Pacific—Melville to Regina, 70 miles; Battleford to Biggar, 50 miles; Regina to boundary line, 90 miles; Regina to Moose Jaw, 40 miles; Young-Prince Albert, 90 miles; Moose Jaw northwest line, will be gone on with. This makes a total of Grand Trunk Pacific construction of 345 miles.

By the Canadian Pacific Railway—Northwest, 60 miles; Graven-Colonsay, 65 miles; Weyburn-Lethbridge, 20 miles; Estevan-Forward, 35 miles; Regina-Bulyea, 10 miles; Lauder extension, 20 miles; second track from Moose Jaw to Pasqua, 7 miles, second track from Moose Jaw to Caron, 16 miles; Moose Jaw, southwest, 35 miles; Swift Current, southeast, 45 miles; Swift Current, northwest, for 35 miles. This makes a total for the Canadian Pacific Railway construction of 348 miles.

Work in Montreal has commenced on the demolition of the residences that have for many years occupied the site of the new "Balmoral" office building which is about to be erected on St. Catherine street just east of Bleury. The building will have frontages on Mance and Balmoral streets as well as St. Catherine street. The building will be a ten-storey fireproof structure with 15,000 square feet of floor space on each flat. It is being built by Henry Morgan & Company Limited, of Beaver Hall Hill. The building is to be ready for occupation by next May.

Catalogue "F" of the Buffalo Pitts Company is a loose leaf pamphlet describing contractors' double cylinder hauling engines and also reversible road cars for heavy freight. The catalogue illustrates in a neat and concise manner special features of mechanism and operation relating to both.

The Western Wheel Scraper Company, of Aurora, Ill., have recently issued a prospectus relating to their various appliances for the handling of earth and stone. In it their products are classified as follows: Section 1, scrapers and road plows; Section 2, dump cars of various capacities, standard and narrow gauge; Section 3, dump wagons and elevating graders; Section 4, graders and crushers. Numerous diagrams illustrating types of difficult work that these machines have been successfully selected to do are also given. The whole is a 128-page pamphlet which contractors will find instructive as well as interesting.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Burnaby, B.C.

Waterworks. Cleveland & Cameron, Winch Bldg., are calling for tenders for special casting for water main.

Bridgeburg, Ont.

By-laws to be submitted for engineering. A by-law will be submitted on July 6th to raise $8,000 for sewer extensions.

Coquitlam, B.C.

The city engineer has recommended $140,000 for road improvements.

Calgary, Alta.

By-law to be submitted for waterworks. Owner, Corporation of Calgary, City Clerk, W. D. Spence; city engineer, J. T. Child, Calgary. To construct and install catch basins on the streets and avenues. The vote will be taken July 14th.

Dresden, Ont.

By-law carried for waterworks and fire protection, $16,000. Owner, Corporation of Dresden; chairman fire, water & light committee. Ald. Carscallen. Some 10,370 ft. of pipe will be laid and 35 hydrants put in. Engineer's report estimated cost $15,583; for $7,000 more a domestic supply can be installed. This may be done later on.

Edmonton, Alta.

A by-law will be submitted on July 18 to provide $100,000 for paving works. A. J. Latornell, city engineer.

Plans being prepared for pumping station. (West end). Owner, City of Edmonton, Alta; city engineer, A. J. Latornell, Edmonton, Alta. Tenders will be asked for shortly. Supplementary report later.

Eburne, B.C.

Sewer system. Cleveland & Cameron, engineers, Winch Bldg., Vancouver, are preparing plans for a complete sewer system.

Grandview, Man.

Tenders called for granolithic sidewalk. Owners, Corporation of Grandview, Man.; W. Dickie, clerk; engineer in charge, H. G. Beresford, Dauphin, Man. 18,000 square feet of granolithic sidewalk to be constructed, 8 feet wide on Main street. Further information obtained from W. Dickie. Tenders received until noon, July 10th.

London, Ont.

Asphalt pavement. A petition is being circulated to have streets between Ridout and Wellington paved. City Engineer Wright.

Medicine Hat, Alta.

Equipment required for extension to waterworks, Riverdale. City engineer, A. K. Grimmer. Owner, City of Medicine Hat, Alta. Cost not estimated yet, probably $25,000. Pumps, boilers, pipe, etc., will be needed.

Midland, Ont.

Tenders called for sewerage work. Owner, corporation of Midland; Frank R. Weston, town clerk. Labor and materials required for construction of sanitary sewers, comprising about 4,700 lin. ft. of pipe sewers; plans, etc., at office of Chipman & Power, engineers, Mail Building, Toronto, or at office of town clerk. Advt. in "Tenders and For Sale Department" of this issue.

Montreal, Que.

Tenders called for sewers. Owners, Corporation of Montreal. Construcof sewers in Garnier, Fabre, Marquette streets and Laurier and Grand avenues. Plans, etc., at office of Superintendent of Sewers. Tenders addressed to board of commissioners received until noon, July 6th.

Municipality of Assiniboia, Man.

By-law to be submitted for paving, $600,000. Secretary-Treasurer, Frank Ness, St. Charles, Man.; highway commissioner, A. McGillivray, Parliament Bldgs., Winnipeg, Man. The municipal council have decided to submit a by-law to pave Portage avenue road, five miles west; the paving of the south side of the Assinboine river will extend two miles along the river. The above is part of a scheme covering one or two years, this year's work to be completed by November 1st. Tenders will be called as soon as authority is given to borrow the required amount.

Moorefield, Ont.

Tenders called for municipal drain No. 1. Owner, Township of Maryborough, County Clerk, W. W. Scott, Moorefield. Construction of a drain, containing about 33,000 cubic yards of excavation. Plans, etc., at office of county clerk. Tenders received until July 14, by county clerk. Advertisement in "Tenders and For Sale Department" of this issue.

Quebec, Que.

Tenders called for permanent sidewalks, stone curb. Owner, Corporation of Quebec, Que.; city engineer, W. D. Baillairge, Quebec. Supplying and laying of stone curb and permanent sidewalks in certain streets. Tenders received until 4 p.m., July 5, by city engineer.

CONTRACTS AWARDED

Niagara Falls, Ont.

Cement walk. Owner, Corporation of Niagara Falls, Ont.; contractor, D. W. Mitchell Construction Co., Niagara Falls, Ont., at 12¼c. for walks and 10c. for curbs. Prices ranged from 12¼c. to 14½c. on walks, and on curbs, from 10c. to 13c. Amount required, 50,000 feet cement walk; 2,500 feet curb.

Ottawa, Ont.

Equipment required for excavation and grading, Ottawa South. Owner, V. V. Rogers, Spark street, Ottawa; contractor, O'Leary Bros., Ottawa. 40,000 cubic yards to be moved about 1,000 ft. Required steam shovels, cars, etc.

Quebec, Que.

Tenders called for steam roller. Owner, Corporation of Quebec; city engineer, W. D. Baillairge, Quebec. Tenders are called until 4 p.m., July 5, for supply of steam roller, by city engineer.

Paving. Owner, corporation of Quebec; city engineer, W. D. Baillairge, Quebec; contractors, Messrs. Falardeau & Co. The tender of Falardeau & Co. was again considered and the award made with some changes, at a special meeting of the council.

Sussex, N.B.

Owners, Corporation of Sussex, N.B. By-law carried to raise $15,000 for improvements and extensions to waterworks and sewerage systems.

Steelton, Ont.

Tenders called for cement walks. Owner, Corporation of Steelton, Ont.; Jas. Lyons, mayor; engineer, Chipman & Power, Mail Bldg., Toronto. Construction of about 72,000 square feet of cement sidewalks and 7,200 lin. ft. of cement curb. Plans, etc., at offices of Chipman & Power, Steelton, Ont. Tenders received until July 4, by J. Robinson, town clerk.

Tenders called for sewers and roadways. Owners, Corporation of Steelton, Ont.; town clerk, J. Robinson; engineer, Chipman & Power, Mail Bldg., Toronto. Construction of about 1,050 feet of 12-in. vitrified pipe storm sewer, including catch basin and manholes; about 2,750 feet of concrete curb and about 6,400 square yards of macadamized roadway. Plans, etc., at office of Chipman & Power, Steelton, Ont. Tenders received by town clerk until July 4.

Vancouver, B.C.

Clearing and grading. Owner, City of Vancouver. Successful tenderer, McKay & Healey, 690 7th Avenue west, $1.575. Others tendered as follows: G. Paonesso Co., Cedar Cottage, city, $1,750; Billy A Kupoff, 413 Pacific Bldg., $1,775; Brown & Latimer, North Vancouver, $,2000; Warren & Boyd, 812 Pender street east, $2,225; W. S. Prescott, 1462 11th Avenue, $2,848; Wm. Sjoquist, New Westminster, B.C., $3,000.

Plans approved for sewerage, $750,000; city engineer, F. Fellowes. Large Mains in Wards V. and VI., to cost $200,000. Maple street, trunk sewer from Creelman avenue to First avenue to be extended up Cedar street and laterals put in, cost $25,000. Plans approved by board of works. W. McQueen, city clerk.

Weyburn, Sask.

By-law to be submitted for waterworks extensions. Owner, Corporation of Weyburn, secretary-treasurer, Geo. Ross. By-law to authorize the borrowing of $40,000 for completion of waterworks system and to cover extension [illegible]. Vote will be taken on July 14th

Railroads, Bridges and Wharves

Brandon, Man.

Work in progress for transfer track. Owner, Great Northern Railway, Brandon; engineer, W. H. Stevenson, G.N.R. Brandon. No tenders were called either for construction or grading. Company will lay steel, employing its own track gang. Grading began June 26, 1911. J. Bradley, local contractor, working under G. N. R. engineer.

Negotiations in progress for street railway. City Engineer, R. E. Speakman, Brandon, Man. James D. McGregor, financier, representing British capitalists, says engineers of the principals he represents will be in Brandon this week to report on the street railway proposition. On receipt of their report the syndicate will lay a proposition before the city for securing a franchise for the system. System as adopted by city calls for about seven miles of track with car barns and overhead work. Supplementary report later.

Brampton, Ont.

Tenders called for steel bridge over Credit river. Owners, Tps. of Chinguacousy and Esquesing; county clerk, D. Kirkwood, Brampton, Ont.; county engineer, C. R. Wheelock, Orangeville, Ont. Construction of a 75-ft. steel sran between Tps. of Chinuacousy and Esquesing, about one mile from Terra Cotta. Spesifications obtained from county engineer. Tenders received until July 11, by connty clerk. Advertisement in "Tenders and For Sale Department" of this issle.

Chilliwack, B.C.

The city and municipal council have decided to build a new bridge across the Hope river on Wells street.

Calgary, Alta.

The Calgary & Edmonton Railway Company will apply to Parliament to authorize the construction of a branch line from a point near Sedgewick to a point on the Lacombe branch extension Range 11 West 4th, and two other branches in Range 17, 18 or 19 West 4th. Andrew I. Thompson, Ottawa, agent. H. C. Oswald, secretary.

Montreal, Que.

Tenders called for concrete sheds, Tarte Pier. Owner, Harbor Commissioners of Montreal; David Seath, secretary, Montreal; chief engineer, F. W. Cowie, Montreal. Construction of two concrete wharf sheds. Plans, etc., upon application to chief engineer. Tenders received by the secretary until July 5th.

Millbank, Ont.

Tenders called for bridge. Engineers, Bowman & Connor, Berlin, Ont. Construction of concrete abutment at Armstrong's bridge on the Perth-Waterloo County line, three miles south of Millbank. Further information obtained from Bowman & Connor. Tenders received until 2 p.m., July 11th. Advertisement in "Tenders and For Sale Department" of this issue.

Niagara Falls, Ont.

Work will be started shortly on a new steel arch bridge to replace the present cantilever across the Niagara river. Michigan Central Railway, controllers of the bridge.

Oakville, Ont.

Representatives of Halton County Council are asking assistance from the government for the construction of a high level bridge over the Sixteen Mile creek. Estimated cost, $22,000.

Ottawa, Ont.

Canadian Northern Railway. General contractor, J. P. Mullarkey. 1st Sec., Sydenham, Ottawa. Bonneville, P. and Son, Lancaster, Ont.; Brennan Peter J., Ottawa, Ont, 587 Gladstone avenue; Dixon J. R., Ott, Ont. (Fence) 650 Gilmour street; Henniger, M. G., Grand Falls, N. B.; Leamy, F. A. & C. M.; James Macdonald Construction Co., Syenham, Ont.; Ross McCombe, Dwyer Hill P. O. Ont.; Simmons, C. J. B. Fredericton, N. B. II Sec, Hawkesbury-Montreal. Bonneville, P. & Son, Lancaster, Ont.; Kert, Isaac, 546 Papineau avenue, Montreal; Quebec Contracting Co. Ltd., St. Nicholas bldg., Mont Dixon J. R. (Fence and Telegraph) Ottawa, Ont. ....

Port Arthur, Ont.

By-laws to be submitted for engineering, $157,755. $10,000 towards construction of bridge over Current river; $9,000 extensions of telephone system; $17,250, extensions of street railway; $16,505, sidewalks and streets; $75,000, extensions of waterworks; $30,000, completion of storage dam at Current river. The by-law will be voted on July 6th. J. M. Teigue, city clerk.

Plattsville, Ont.

Tenders called for bridges. Owner, County of Oxford. County engineer, F. J. Ure, Woodstock, Ont. One 25-ft. beam span with concrete floor and abutments. One 45-ft. span steel truss with concrete floor and abutments; and the building of concrete abutments under two other bridges. Further particulars, apply to J. O. Given, reeve of tp. of Blenheim. Tenders received by engineer until 2 p.m. July 13th. Advertisement in "Tenders and For Sale Department" of this issue.

Rivers, Man.

Tenders closed for bridge, $6,000. Owner, municipality of Daly, Man. Probable contractor, Henry Koester, Brandon. Steel on concrete abutments, one span, 80 feet long, 26 feet width, concrete abutments. Tenders for superstructure closed; contract will be awarded June 30, Henry Koester, Brandon, will probably be successful tenderer, his bid being lowest.

Sault Ste. Marie, Ont.

Tenders called for railway. Owners, Algoma Central Railway; chief engineer, R. S. McCormick, Algoma Central Railway Sault Ste. Marie. From Hobon on C. P. R. to the National Transcontinental Railway, 142 miles west of Cochrane, a distance of 101 miles. Work includes construction work to subgrade, and in addition, track laying and ballasting. Specifications at office of Chief Engineer, Sault Ste. Marie. Tenders received until noon; July 15, by chief engineer.

Three Rivers, Que.

Negotiations delayed for street railway. Owner, Three Rivers street railway, Three Rivers, Que. Action of city council to organize approved by citizens. The proposition has been shelved for the present.

Company being organized; street railway. Owners, Three Rivers Street Railway, Three Rivers, Que. Action of city council to organize approved by citizens. $375,000 stock to be taken up by city and $25,000 offered to public company to be formed at once.

Toronto, Ont.

Time for tenders extended for seawall, Lake Ontario, vicinity of Exhibition grounds. Chairman, Board of Control, F. S. Spence, City Hall; city engineer, C. H. Rust, Toronto. Construction of seawall. Specifications on application to the Department of Railways and bridges, City Engineer's office. Tenders received by the Chairman, Board if Control, until noon, July 17th. Advertisement in "Tenders and For Sale Department" of this issue.

Thorold, Ont.

Contemplated, turning basin, $30,000. Owner, Department of Railways & Canals, Ottawa; secretary, L. Jones; canal superintendent, L. Weller, St. Catharines, Ont. The site is selected and money provided.

Teeswater, Ont.

The county council will introduce a by-law to borrow $20,000 on debentures for rebuilding Brant and other bridges. P. A. Malcolmson, county clerk.

Vancouver, B.C.

Plans submitted to council for bridges, $434,300, Hastings, Pender, Harris & Keefer streets. City Clerk, W. McQueen; consulting engineer, Waddell & Harrington; city engineer, F. Fellowes. Structures on Hasings and Harris streets to be double tracked. Material, reinforced concrete and steel.

Woodbridge, Ont.

By-law to be submitted for bridge, $4,000. A by-law to raise $4,000 for construction of bridge on Clarence street will be submitted on June 30. E. Brown, clerk.

Waldemar, Ont.

Tenders called for Steel bridge over Grand River. County engineer, C. R. Wheelock, Orangeville, Ont. Construction of a 115 ft. span over Grand River about one mile from Waldemar. Specifications obtained from county engineer. Tenders received until 1 p.m., July 4th, by County Engineer. Advertisement in "Tenders and For Sale Department" of this issue.

CONTRACTS AWARDED

Vancouver, B. C.

The contract for building the C.N.R. between Hope and Kamloops, a distance of 163 miles, $15,000,000, has been awarded to Northern Construction Co., A. R. Mann, president.

Weston, Ont.

A. C. Lewis has been awarded contract for concrete work of the Weston Road bridge, $2,600, and Canada Foundry Co., steel span, $8,740.

Public Buildings, Churches, Schools, etc.

Big Point, Ont.

Tenders called for school, $3,000. Owner, Separate School Board, Dover, Ont. One storey, 37 x 47, concrete block foundation, stone, brick and frame, hot air heating, shingle roof, interior, Georgia pine, cut stone, metal ceiling, shingle stain. Tenders received after July 1st until July 15.

Burnaby, B.C.

Two frame schools, $6,000 each. Architect, J. H. Bowman. Tenders closed on the frame schools on June 28th.

Cannington, Ont.

Revised plans prepared for school, $8,000. Owner, Board of School Trustees; architect, G. M. Miller & Co., 59 Yonge street, Toronto. Two storeys, brick, cement foundation, steam heating, shingle roof. Plans submitted to Board of Trustees for approval. Tenders will be called shortly.

Chatham, Ont.

Plans being prepared for school. Owner, Board of Education, Chatham; architect, Jas. L. Wilson, Chatham. Two storeys and basement, 70 x 90, brick and stone, stone foundation, direct-indirect heating, electric lighting, gravel composition, hard wall plaster, interior finish, cut stone, terra cotta, tile, armored concrete, reinforced concrete, artificial stone, metallic lath, structural iron, ornamental iron, fire escapes, cornice pipe covering, electrical work, electrical bells. Tenders received after July 4. Exact date not decided yet.

Cloverdale, B.C.

Tenders called for school. Owner, Department of Public Works, Victoria, the Public Works Engineer, J. E. Griffith. Four rooms, timber framed school, concrete basement. Plans at the office of Rev. T. H. Wright, secretary to the school board, Cloverdale; the government agent, New Westminster, and at the Department of Public Works, Victoria. Tenders received until July 10th.

Edmonton, Alta.

A by-law will be submitted on July 18 to raise $55,000 for erection of a nurses' home. Mr. Brown, city solicitor.

Edmonds, Burnaby, B.C.

School sites. Three sites have been obtained by school trustees, one of which will be built on early next year; the others later.

Echo Place, Ont.

Tenders called for school, $18,000. Owner, S. S. No. 14, Tp. of Brantford; secretary, J. L. Barnes, Echo Place; architect, G. W. Hall, Brantford. Two storeys, four rooms, 45 x 80, brick and stone, concrete foundation, steam heating, electricity and gas lighting, modern, slate roof, cement work, marble, tile, artificial stone, ornamental iron, electrical work, telephone system, plate glass, art glass. Tenders received by secretary, until July 10.

Fort William, Ont.

Tenders called for Y. M. C. A. building, $75,000. Owner, Y. M. C. A., Fort William. Four-storey solid brick, 100 x 100, cement foundation, cut stone, structural iron, fire escapes, fireproof dors, electrical work, steel beams, iron columns. Tenders received by architect until 5 o'clock, July 8. Marked cheque for $5,000 to accompany all bulk tenders or marked cheque for ten per cent. on all separate tenders.

Galt, Ont.

Tenders called for addition to hospital. Owner, Board of Governors; secretary, W. H. Lutz, Galt; architect, W. Grayson Brown, Chancery Chambers, Hamilton. Alterations to hospital. Plans, etc., at office of the secretary. Tenders received by secretary until noon, July 4th.

Hamilton, Ont.

Tenders to be called for public library. Owner, Hamilton Public Library; secretary, A. Hunter. Marble work, iron stairs and staircases, office fittings, vault doors, electric fittings, switchboard. Specifications obtained from A. Hunter. Tenners will be called about end of September.

Hillsboro, N.B.

Tenders called for public building. Owner, Dominion Government, Ottawa. Secretary Department of Public Works, Ottawa, R. C. Desrochers. Plans, etc., at office of Mr. D. H. Waterbury, superintendent of public buildings, St. John, N.B., at Post Office, Hillsboro, N.B., and at Department, Ottawa. Tenders received by secretary until July 10.

Hope, B.C.

Tenders called for court house. Owner, Department of Public Works, Victoria, B.C.; public works engineer, J. E. Griffith, Department of Public Works. Erection of timber framed lock-up and court house. Plans, etc., at the office of the government agent, Ashcroft, B.C. A. H. Governor, Esq., provincial constable, Hope; provincial timber inspector, Vancouver, and the Department of Public Works, Victoria. Tenders received by public works engineer until July 6.

Lethbridge, Alta.

R. V. Gibbons has sold lots on Fifth avenue for $13,000 as a site for a new convent.

London, Ont.

Tenders called for Masonic Temple. Owner, Masonic Order; architect, Wm. G. Murray, 11 Masonic Temple, London. Steel, reinforced and brick construction. Tenders received by architect till 5 p.m., July 10th.

Montreal, Que.

The directors of the Canadian Theatres, Limited, have purchased a site from Strickland & Strickland and plan the erection of an up-to-date Vaudeville House on St. Catherine street. Ross & McFarlane, architect.

Plans being prepared for theatre, $150,000, St. Catherine street near St Charles Borrome. Owner, Canadian Theatres, Limited; architect, Ross & McFarlane, Beaver Hall and Belmont st., Montreal. Three-storeys, cement and brick. Tenders not called yet. Supplementary report later.

Church of St. Jean Baptiste on Rachel street, destroyed by fire; loss $200,000. Fully insured.

The plans for the new school building have been accepted. Work will be started this summer. Preparations have been made so that the work when started can be carried on.

Plans are being prepared for church, Dorchester street and Green avenue. Owner, Calvary and Bethlehem congregations (uniting); architect, Robert Findlay, 10 Phillips Place, Montreal. Brick, stone and concrete. Date for receiving tenders not set yet.

Oak Bay, B.C.

The council will take immediate steps for the construction of an incinerator plant.

Ottawa, Ont.

Tenders called for Synagogue, $15,000, King Edward avenue. Owner, Hebrew congregation, Ottawa architect, J. W. H. Watt, Central Chambers, Ottawa. 60 x 56, solid brick, hot water heating, electric lighting, tar and gravel roofing, cut stone, fire escapes, electrical work, iron dome, interior finish ash. Tenders received immediately by A. Sugarman, 35 York street, Ottawa. Close June 29.

Tenders called for public library. Owner, Public Lbrary Board, chairman, Herbert S. Campbell; Librarian, L. J. Burpee, Ottawa. Certain changes in the heating system. Specifications at offices of the librarian. Tenders received by chairman until 4 p.m., July 13.

Port Hope, Ont.

Tenders called for hockey rink. Owners, Trinity College Boys' School, Port Hope: architect, Ellis & Connery, Manning Chambers, Toronto. One storey, 96 x 200; frame and concrete, concrete foundation, felt and gravel roofing. Tenders received until July 1st.

Port Arthur, Ont.

By-law to be submitted for buildings. $6,000 improvements to municipal buildings. A by-law will also be submitted to guarantee the bond of a ocmpany to be incorporated by J. L. McRae to the amount of $30,000, etc. The vote will be taken on July 6. J. McTeigue, city clerk.

Saskatoon, Sask.

By-law to be submitted for buildings, $95,000. $45,000 to be used in converting King Edward school into municipal offices; $50,000 to pay for two new fire halls and equipment. The vote will be taken on July 6th. A Leslie, city clerk.

Architect chosen for Y. M. C. A. building. Owner, Y. M. C. A., Saskatoon, Sask. Chief architect, D. W. F. Nicholls, 499 Main street, Winnipeg.

South Vancouver, B.C.

Tenders called for school, $40,000. Owner, School Board, South Vancouver; architect, J. H. Bowman, Crown Bldg., Vancouver. Two-storey, brick mill construction, concrete foundation, slate roof, cornice, eight rooms, electric lighting, hot air heating.

Shoal Lake, Man.

Fire reported. The post office, government telephone exchange and the Millar block were destroyed by fire on the 25th inst. Estimated loss on Miller block, $13,000. Total loss, $18,000

Toronto, Ont.

Tenders called for public school. Owner, [illegible] architects, J. P. Hynes, Bank of Com-

[illegible] Bldg., [illegible] Yonge street, Toronto. Erection of the McCormick Social Centre Building in the Brock avenue Playgrounds, Toronto. Tenders received until July 6th by the architect.

Proposed alterations for club house. Owners, Engineers' Club, Toronto; architect, A. Rolfe, 12 Queen street east. Engineers' Club have purchased building occupied by Toronto Saturday Night and propose remodelling it for club purposes. No plans have as yet been drawn.

Vancouver, B.C.

Plans being prepared for rink, Georgia street. Owner, Patrick Bros.; architect, Thos. Hooper, Winch Bldg., Vancouver 320 x 200. Tenders will be called in about ten days. Plans are being prepared for a Baptist church on 10th Avenue to cost about $25,000 by the same architect. Tenders were called last week by T. Hooper for a 6-storey steel and brick building for Otis Fenson Elevator Company.

Victoria, B.C.

The Victoria Arena Co., Ltd., incorporated for the purpose of establishing an artificial rink in this city. Capital $100,000.

CONTRACTS AWARDED

Cranbrook, B. C.

Indian school and chapel, $100,000. Owner, Dominion Government, Ottawa. General contractor, John J. Wood, Fernie, B. C.; 2-storey and basement; main building 50 x 160; chapel, 27 x 47, brick. Work awarded June 3, contract not yet signed. Sub-contracts not let yet.

Hamilton, Ont.

Church, $4,700, Garth and Main. Owners, Centenary Church Trustees, Hamilton, Ont. Architect, W. A. Edwards; general contractor, C. S. Scott, Hamilton. One storey and basement, 63 x 36 feet. Mason, C. S. Scott; cement contractor, C. S. Scott; carpenter, J. Evans; heating contractor, Charles Drew; plumbing, contractor, Fitzsimmons Bros.; sheet metal contractor, C. Drew; contractor for iron work, Hamilton Bridge Co.; electrical work, Culley & Breaym.

Revelstoke, B.C.

Court House, $120,000. General contractors, Messrs. Foot & Praldeonie, Revelstoke. Brick and steel.

Strathcona, Alta.

Armory. Three storeys, brick and stone, 51 x 90. General contract awarded to The Cowan Construction Co., Winnipeg.

St. Thomas, Ont.

School. Two storey brick building, to be completed September 1st. Contracts awarded as follows: Masonry, E. Ponsford, $4,079; carpentry, Green & Sons, $4,084; plastering, J. Stewart, $840; plumbing, J. Williams, $1,127; all of St. Thomas. Heating, Ewart Mfg. Co., $850, Brockville.

Sherbrooke, Que.

Barracks, $8,000, (Wellington street). Owner, Salvation Army, Sherbrooke, Que. General contractor, Sherbrooke Construction Co. 2-storey, 30x60, brick and wood. Contract let June 16. Building to be completed Aug. 1st.

Saskatoon, Sask.

Church, $126,000. The contract for erection of church was let to Smith Bros. & Wilson,. Architect, J. N. Semmens, McArthur building, Winnipeg.

Residences

Aylmer, Ont.

D. Braneon's barns, three miles north, destroyed. Loss $7,000, partly insured.

Brantford, Ont.

Tenders called for apartments, $5,000. Owner, W. K. Halloran, Brantford, Ont,; architects, Taylor & Taylor, Brantford; 2 storeys and basement, 28 x 40, brick and stone, concrete foundation, steam heating, electric lighting, slate roofing, mantels, artificial stone, electrical work, telephone system, interior finish, hardwood and pine. Tenders received after July 1st until July 10.

Hamilton, Ont.

Tenders called for residence, $4,500. Owner, W. J. Pulling, Sandwich, Ont. Architects, Crane & Pennington, Windsor, Ont. Two storeys, 31 x 32, solid brick, brick foundation, cut stone, hot water heating, electricity and gas, modern plumbing, shingle roof, interior finish, oak, mantels, electric bells. Tenders received until July 7th.

Medicine Hat, Alta.

Plans being prepared for residence, $8,000. Owner, J. McLean, Medicine Hat, Alta; architect, W. T. Williams, Medicine Hat, brick and frame, concrete.

Plans being prepared for three residences. Architect, W. T. Williams, Medicine Hat, Alta. Owners, J. K. Drinan, Medicine Hat ($5,000); frame and concrete (bungalow style); R. N. Napier, manager, Bank of Montreal, $4,000; frame, Mr. McDonnaha, $4,200, bungalow, frame and concrete. All of Medicine Hat. W. T. Williams, architect for all.

Montreal, Que.

Residence, $10,000. D. Blay, 111 Delinelle street, Montreal, is having a residence built on St. Phillippe street, three storeys, 70 x 46, gravel roof.

Residence, $15,000, F. Clavette, 282 Outremont avenue, will build a residence on St. Joseph Boulevard. Five storeys, 54 x 130, brick, hot water heating, electric lighting.

North Bay, Ont.

Heating and plumbing required for residence, $6,000. Owner, J. W. McDonald, North Bay; architect, J. K. Burt, North Bay. 2½ storeys, brick. General contract let June 26, building to be completed November 1st.

Ottawa, Ont.

Tenders to be called for residence, $6,000, Carling avenue. Owner, E. Barrett; architect, C. P. Meredith, Sparks street, Ottawa; 2½ storeys, solid brick, hot water heating, lighting electric, cut stone, mantels, weather strips. shingle stain, electrical work. Tenders received after June 29th, closed July 15th.

Tenders to be called for residence, $15,000, Marlborough avenue. Owner, D'Arcy McGee, Ottawa; architect, C. P. Meredith, Sparks street, Ottawa. 2½ storeys, solid brick, stone foundation, hot water heating, electric lighting, shingle roof, hardwood interior finish, cut stone, marble, mantels, weather strips, fireproof doors, or windows, electric bells, shingle stain. Tenders received after July 1st, closed July 15th.

Prince Rupert, B.C.

Plans prepared for residence, $8,000, First avenue. Owner, F. H. Mabley, First avenue, Prince Rupert; architect, A. L. Barker, Third avenue, Prince Rupert. Two storeys, 35 x 45, frame, steam heating, cement foundation, shingle roof, mantels, electric bells, art glass, refrigerator, dumb waiter, shingle stain. No contracts let yet.

Saskatoon, Sask.

Apartment house. Storey & Van Egmond, architects, of Regina and Saskatoon, have plans for a 30-suite apartment house, 50 x 130 feet, $30,000. Mr. Turner, local representative.

Toronto, Ont.

Tenders to be called for garage, $3,000, Dundas street. Owner, G. Curavo, 1701 Dundas street, Toronto (private plans); 1 storey, 60 x 46, brick foundation, combination lighting, felt anad gravel roof, structural iron, cement work. Tenders received after July 1st.

Tenders called for residence, $3,500. Owner, Mr. Woodcock, Toronto; architect, Ellis & Company, Manning Chambers, Toronto. 2½ storeys, 25 ft. 9 in. by 30 ft. 3½ in., brick, stone, hot water heating, shingle roofing. Tenders received until June 30th.

Tenders called for residence, $3,400, College street. Owner, S. Shaver, 402 Dovercourt road, Toronto (private plans). 2½ storeys, 34 x 24, brick foundation, brick, slate roofing, hot air heating. Tenders will be open for about ten days for heating and plastering.

Heating, lighting, plumbing required for residence, $2,500, Edgewood Crescent. Owner, A. A. Kennedy, 431 Palmerston avenue, Toronto; architect, J. H. Galloway, 23 Toronto street, Toronto; two storeys, brick and stone, hot air heating, electric lighting. Tenders on heating, lighting and plumbing will be opened for the next two weeks.

Plans prepared for residence, $3,800, Howard Park avenue. Owner, J. C. West, 1125 College street, Toronto; private plans. 2½ storeys, 32 x 24, brick foundation, brick, hot water heating, combination lighting, modern plumbing, slate roof, interior finish, hardwood, cornice. Tenders will be called in about two weeks.

Heating, Lighting, and plumbing required for residence, $4,000. Owner, C. Coulter, 377 Palmerston avenue, Toronto, private plans, 25 x 37.9, 2½ storeys, brick, stone foundation, hot water heating, electric lighting, slate roof, hardwood finish. Tenders received during next week for lighting, heating, plumbing.

Tenders open for apartment house, $30,000, Glen road and Howard street. Owner, A. A. Garrett, Maple avenue, Toronto; architect, J. A. Harvey, 302 Manning Chambers, Toronto. Three storeys, 60 x 36, brick and stone, brick foundation, steam heating, electric lighting, felt and gravel roofing, tile and fire escapes, skylights, electric bells, telephone system, heating, lighting, plumbing, lathing and plastering tenders will be open for about a week yet.

Plans prepared for thirteen detached dwellings, $26,000, Gilmour avenue. Owners, Max Slatkin, 235 Gilmour ave., Toronto; private plans. Two storeys, 38 x 17, stone foundation, brick, hot air heating, combination lighting, felt and gravel roofing. Work will be done by day labor, commencing in about four days.

Tenders called for residence, $2,000, Kenneth avenue. Owner, C. B. Hodson, 1613 Dundas street, Toronto (private plans). 2½ storeys, 32 x 22, stone and brick, stone foundation, hot water or combination heating, slate roof, cement roof, cement work, electric lighting. Tenders open for a week for heating, lighting, lathing plastering, and roofing.

Heating, lighting and plumbing required for residence, $3,000. Owner, A. A. Kennedy, 431 Palmerston avenue, Toronto; architect, J. H. Galloway, 23 Toronto street, Toronto; 2½ storeys, 25 x 36, brick and stone, hot water heating, electric lighting, open plumbing. Tenders called for heating, lighting and plumbing during the next two weeks.

Tenders called for residence, $7,500, Lonsdale and Lawton. Owner, R. D. McLeod, Walmer Road Hill, Toronto; architect, J. H. Stanford, 34 Yonge St. Arcade, Toronto; 2½ storeys, 34 x 30, brick, stone foundation, cut stone, cement work, pipe covering, combination lighting, hot water heating, slate roof, weather strips, electric bells, shingle stain, sheet metal work, tile and mantels, art and plate glass. Tenders received by owner, July 3rd.

Tenders to be called for alterations to residences, $4,000, 80 and 82 Pembroke street. Owner, R. S. VanVlack, Gore Vale avenue, Toronto; architect, J. Hunt Stanford, 34 Yonge Street Arcade, Toronto. Three storeys, brick, stone foundation, hot water heating, combination lighting, felt and gravel roof, hardwood finish, cement work, cut stone, tile mantels, reinforced concrete, metallic lath, sheet metal work, cornice skylights, weather strip, fireproof doors, deafening paper, steel beams, plastic relief work, plate and art glass. Owner is altering two houses into apartments. Tenders called for everything but masonry after July 3.

CONTRACTS AWARDED

Chapleau, Ont.

Residence, $5,900. Owner, O. Boucher, Chapleau; architect, H. W. Angus, North Bay, Ont.; general contractor, J. P. Quinlan, North Bay. General contract let first part of month; heating and plumbing not yet let. Building to be completed October 1st.

Hamilton, Ont.

Residence; two storeys, brick, 27 x 32. Contracts awarded as follows: Masonry, Rudolf Bros., Hamilton; plastering, H. Hull; heating, J. M. Luxon; plumbing, J. M. Luxon; sheet metal, W. D. Jackson; stone work, W. H. Northcott; electric light and gas to be used, hot water heating.

Business Buildings and Industrial Plants

Aurora, Ont.

Plans in progress for factory, $10,000. Owners, Positive Clutch & Pulley Works; architect, A. R. Denison & Stephenson, 16 King street west, Toronto. Two buildings to be erected, two storeys, wood shop and 1 storey machine shop. Concrete block. Supplementary report later.

Brighton, Ont.

By-law to be submitted for factory. Parties interested, Corporation of Brighton and Niagara Brand Spray Co. Company to build factory in return for civic privileges.

Brantford, Ont.

Tenders called for factory warehouse, $18,000. Owner, Massey Harris Company, Brantford; F. Grobb, local manager. Three storeys, 162 x 56, brick work. Tenders called until July 1st, possibility that time may be extended until July 8. Contract for lindow frames awarded to Mickle, Dyment & Son, Brantford.

Tenders called for stores and offices, $10,000, Queen street. Owner, W. F. Cockshutt, Brantford; architect, G. W. Hall, Brantford. Two storeys, 56 x 70, brick and stone, concrete foundation, hot air heating, electric and gas lighting, modern plumbing, Brantford roofing, two vaults, sheet metal work, steel beams, passenger elevator, plate glass, art glass, telephone system, armored concrete, cut stone, fireproofing, interior finish hardwood and pine. Tenders received until July 8th.

Tenders called for business block, Queen street. Owner, W. F. Cockshutt, Brantford. Architect, Geo. W. Hall, F.R.A.I.C., Brantford. Tenders on several trades required. Plans, etc., at 321 Colborne street. Tenders received by architects until noon, July 8th.

Tenders called for factory extension, $40,000. Owner, Cockshutt Plow Co., Geo. Wedlake, Superintendent, Brantford (private plans). Carpenter shop, 110 x 60, 3-storey; structural shop, 100 x 60, 1-storey; blacksmith, 110 x 70, 1-storey; storage, 100 x 70, 1-storey; paint shop, 105 x 60, 3-storey. Walls all of brick, except blacksmith shop, which may be of steel; foundations concrete. Tenders received after July 10th; close about July 20th. Work to be rushed to completion this fall.

Calgary, Alta.

Tenders called for department store. Owner, Hudson's Bay Company; architects, Burke, Horwood & White, 28 Toronto street, Toronto. All trades, except foundations and structural steel required in erection of departmental store. Plans, etc., at office of architect. Tenders called until July 6.

Campbellton, N.B.

Tenders called for hotel, $20,000, Water street. Owners, J. Damboise, Campbellton, N.B. Architect, R. A Frechette, Moncton, B. C. Three storeys, 45 x 95 ft., brick and stone, concrete foundation, hot water heating, electric light, enamel iron plumbing, tar & gravel roofing, cement work, cut stone, brick, terra cotta, reinforced concrete, metallic lath, structural iron, ornamental iron, fire escapes, sidewalk lift, pipe covering, electric bells, roofing paper, sprinkler system, steel beams, ornamental columns, plate glass, refrgerator, interior finish spruce. Tenders received after June 26 until July 10.

Chatham, Ont.

Machinery required for factory. Owner, Christianson Motor Co., of Milwaukee, and Swift Motor Co., Chatham (combined). Final arrangements not yet made. Present plant will not be enlarged as stated in bulletin. Required, about $10,000 worth of iron working machinery, to equip the combined forces with stationary engines as well as marines. The Christianson Motor Co. providing the former and the Swift Motor Co. the latter.

Fort William, Ont.

Tenders called for bank, $25,000 (Victoria avenue). Owner, Geo. A. Graham, Fort William. Architect, C. Wirth, Fort William; 3-storey, terra cotta and brick, concrete foundation, 25x100. Tenders received until July 8th.

Hamilton, Ont.

Equipment required for boiler room, $10,000. Owner, Canadian Westinghouse Co., Hamilton, Ont. Engineer and architect, Westinghouse, Church, Kerr & Co., 8 Bridge street New York. Two storeys, 79.7 x 49.7, brick and steel, electrical work, steel beams. Required, one boiler, low pressure, for heating building, at once. Company does its own construction.

Plans being prepared for factory, $400,000. Owner, Standard Underground Cable Co., Hamilton and Pittsburgh, Pa.; architect, Prack & Perrine, Hamilton. Three storeys, brick and structural iron bldg., 64 x 335 feet; 1 storey, sawtooth building, 60 x 224; 1 storey, sawtooth building, 60 x 250; 1 storey building, 64 x 90; 1 storey building, 30 x 70; also office building with other small buildings, reservoir, etc., steel and brick, tar and gravel roofing.

Equipment required for addition to factory, $12,000. Owner, Zimmerman Knitting Co., Hamilton; architect, P. M. Smith, Hamilton. Two storeys and basement, 126 x 130, brick and steel, stone foundation, steam heating. Firewall and steel stair tower required. Tenders are being called privately.

London, Ont.

Mayor Beattie and Ald. Saunders contemplate the erection of a paving plant here and are investigating the plants at Toronto and Hamilton.

Tenders called for vault fitting. Owner, County of Middlesex, Ont., County Clerk, T. E. Robson; County Engineer, Chas. Talbot, London, Ont. Steel fitings for the south vault of Registry Office for North and East Middlesex on Court House Square, London; vault room, 14 x 24 feet. Plans, etc., to be submitted with tender. Tenders were received until noon, July 4th by County Clerk. Advt. in "Tenders and For Sale Department" of this issue.

Montreal, Que.

H. Forget, 1956 Dufferin street, has plons prepared for erection of a 12-flat building, 100x40 ft., on Christopher Columbus street, $12,000.

The Montreal Locomotive Works, Ltd., Ottawa Bank Building, have had plans prepared by [illegible] Co. for factory at Longue Point, $34,000. Percy Webb, [illegible]

Niagara Falls, Ont.

Plans prepared for store and apartment building. Owner, W. P. Dixon, Niagara Falls Centre (private plans).

(Continued on page [illegible])

Tenders and For Sale Department

To Architects

[illegible] Architect, 1811 Rue St. U[illegible] [illegible] formerly architectural expert [illegible] of France, "Master of Work" of the [illegible] of French architects, [illegible] important architectural [illegible] France, desires either association with architect having work in hand, or the direction of an architectural drafting office in a large firm. 27-28

Notice to Ditch Contractors

Tenders Wanted

Tenders will be received by the undersigned up to 2 o'clock p.m., on **Friday, July 14, 1911**, for the construction of Municipal Drain No. 1 in the Township of Maryborough, containing about 33,000 cubic yards of excavation.

Plans, profiles and specifications of this drain may be seen at the Township Clerk's office in the Village of Moorefield.

The lowest or any tender not necessarily accepted. Satisfactory bondsmen or a marked cheque of 5 per cent. of the tender will be required.

W. W. SCOTT,
Clerk of Tp. of Maryborough.
Moorefield P. O. 27-28

Notice of Extension of Time for Acceptance of Tenders

CITY OF TORONTO

Tenders

For the

Construction of a Seawall

In Lake Ontario, in the Vicinity of the Exhibition Grounds.

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on Monday, July **17, 1911**, in place of Monday, July 3, 1911, as previously advertised, for the construction of a Sea Wall in the vicinity of the Exhibition Grounds.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained on application to the Department of Railways and Bridges, City Engineer's Office, Toronto.

The tenderers shall submit with their tenders the names of two sureties (approved of by the City Treasurer not members of the City Council, or Officers of the Corporation of the City of Toronto), or in lieu of said sureties the bond of a guarantee company, approved of as aforesaid.

The lowest or any tender not necessarily accepted.

F. S. SPENCE,
Chairman of the Board of Control.

City Hall, Toronto, June 26, 1911. 27-27

Bucket Crane

FOR SALE—One full circle, self-propelling, modern 10 to 15-ton capacity Browning size No. 1 Locomotive Crane, standard gauge, 4-wheel truck, 38 ft. steel boom, 8 x 10 engines, equipped to handle Clam or Orange Peel. Will furnish with or without bucket. Attractive price, fine condition, quick delivery. Inspection here.

WILLIS SHAW MACHINERY CO.
39 So. LaSalle Street, Chicago.

CITY OF MOOSE JAW
Saskatchewan

TENDERS

Sealed tenders addressed to the undersigned City Clerk will be received in the Council Chamber, Moose Jaw, up to 8.30 p.m. on **Monday, July 24th, 1911,** for the supply of the following electrical apparatus:—

Contract A.

Fifty 6.6 Ampere, Direct Current, series, Metallic flame arc lamps, complete with globes, etc.
Fifty Absolute cut-out hangers.
One Current Regulator, 50 lamp circuit.
One Mercury Rectifier, 50 lamp circuit.
One Control panel with switches, 50 lamp circuit.

Contract B.

Fifty ornamental arc lamp standards.

Full particulars and specifications may be obtained from J. D. Peters, Electrical Superintendent, Moose Jaw, Sask.

The lowest or any tender not necessarily accepted.

W. F. HEAL,
City Clerk.
25-28

TO CONTRACTORS

Sealed tenders endorsed "Tender for new Government House," addressed to the undersigned, will be received at this Department until noon of **Wednesday, July 12th,** for Concrete Foundations of the new Government House in Chorley Park, Rosedale, Toronto. Plans and specifications may be seen at this department.

An accepted bank chaque payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender and the bona fide signature and addresses of two sureties, must accompany each tender. Cheque will be forfeited to the Crown in the event of the sucsessful tenderer refusing to carry out the work within ten days after acceptance. The Department will not be bound to accept the lowest or any tender.

By order
H. F. McNAUGHTON, Secretary,
Public Works Department.

Department of Public Works, Ontario.
Toronto, July 3, 1911.

Newspapers publishing this advertisement without authority will not be paid for it. 27-27

Contractors' Material

90 Austin 6-yd. two-way Dump Cars, 4 ft. 8½-in. gauge.
Davenport 10 x 16 Dinkey, Standard gauge.
Baldwin 16 x 24 American type locomotive, 4 ft. 8½ in.
Bucyrus 55-ton Steam Shovel, built 1903.
Marion A. A. Steam Shovel, built 1903.
Six Wheel Scrapers.
Two Lidgerwood Cableways, complete.

All of this material in Canada. No duty. Have you anything to sell? Write us.

THE MALES COMPANY,
No. 82 Perin Building,
Cincinnati, Ohio.

Tenders for a Steel Bridge

Sealed tenders marked "Tender for Steel Bridge" addressed to D. Kirkwood, Esq., County Clerk, Brampton, Ont., will be received up to noon on **Tuesday, July 11, 1911,** for the construction of a 75-ft. steel span over the Credit River, on the boundary line between the township of Clanguacousy and Esquing, about one mile from Terra Cota.

Specifications may be obtained from the undersigned.

The lowest or any tender not necessarily accepted.

C. R. WHEELOCK,
County Engineer.
Orangeville, Ont. 27-27

Corporation of the City of Nanaimo
B.C.

Street Paving

Tenders are invited for approximately **14,450** superficial yards of Asphaltic Macadam or other approved paving.

A plan of streets and further particulars may be obtained of the undersigned.

Sealed tenders endorsed "Tender for Paving" to be sent to the undersigned not later than **July 21, 1911.**

The lowest or any tender not necessarily acceptes.

ALLAN WATERS,
City Engineer.
June 26, 1911. 27-29

Tenders for Bridges

Sealed tenders will be received by the undersigned up to two p.m. of **Thursday, the 13th day of July,** for the following bridge work: One 25-ft. beam span with concrete floor and abutments; one 45-ft. span steel truss with concrete floor and abutments; and the building of concrete abutments under two other bridges, all in the neighborhood of the village of Plattsville in the County of Oxford. Tenders will be opened at Plattsville at the time above mentioned.

The lowest or any tender not necessarily accepted.

For further particulars apply to J. O. Given, Reeve of the Township of Blenheim, or to

F. J. URE,
County Engineer.
Woodstock, Ont. 27-27

Bridge Tenders

Sealed tenders will be received by Geo. M. ox, Esq., Warden, Wellington County, Drayon, Ont., up till 2 p.m. on **Friday, July 21st,** or building the following:

1. Douglas 40-foot concrete arch bridge and reakwater near Glen Allen.

2. Concrete breakwater, 10 feet high and 200 eet long, near Glen Allen.

For further information apply to

BOWMAN & CONNOR, Engineers,
36 Toronto Street, Toronto.
or
J. A. WILKINSON,
Morriston, Ont.

7 28

For Sale

Steam and Electric Machinery displaced by iagara Power. One 125 horse power, one 225 ompound Condensing Wheelock Engines in ood condition. Boilers, 14 ft. x 60 in. and 2 ft. x 48 in. complete with iron work and team connection. Condensers, heaters, belt ighteners, pulleys and shafting. Direct Current lectric Dynamos and Motors from one to ighty horse power. Bargain prices. Write for articulars.

W. R. REYNOLDS,
Supt., Power & Light Commission,
Ingersoll, Ont.

5 27

---

he Algoma Central and Hudson Bay Railway Company

Tender
or Railway Construction

Sealed tenders for the construction of the lgoma Central Railway Extension from Hobon the C. P. R., northerly to the National Transontinental Railway at a point approximately 2 miles west of Cochrane, a distance of 101 iles, will be received up to noon **July 15, 1911.**

The work includes all construction work to ub grade, and in addition, track laying and allasting in accordance with plans, profiles, orms of tender and specifications at the office f the Chief Engineer, Sault Ste. Marie, Ontrio.

All tenders to be marked "Tender for Contruction," and to be addressed to R. S. Mcormick, Chief Engineer, Algoma Central Railay, Sault Ste. Marie, Ontario.

The lowest of any tender not necessarily accepted. 26-28

BOARD OF EDUCATION

Tenders Wanted

Sealed tenders adnressed to the Secretaryreasurer of the Board will be received until **hursday noon, July 6, 1911,**

for Plasterers' Work

vork required in the completion of the adlition to Howard school, now in course of erecion.

Specifications may be seen and all informaion obtained at the office of the Superintenlent of Buildings, City Hall.

Each tender must be accompanied with an ccepted bank cheque for 5 per cent. of the mount of tender, or its equivalent, in cash.

Tenders must be in the hands of the Secreary-Treasurer at his office in the City Hall ot later than 12 o'clock noon on the said day, fter which no tender will be received.

The lowest or any tender will not necessarly be accepted.

V. W. HODGSON,
Chairman [illegible] Committee.
W. C. WILKINSON,
[illegible]

7 27

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Town of Yorkton will be received up till six o'clock p.m. **Monday evening,**

July 24, 1911, for the construction of approximately thirty-five hundred (3,500) feet of Water Main and thirty-five hundred (3,500) feet Sewer Main in the Town of Yorkton. Plans and specifications may be obtained on applying to the Secretary-Treasurer of the Town of Yorkton, or the consulting engineers. A marked cheque equal to five per cent. of tender must accompany each tender. The lowest or any tender not necessarily accepted.

McARTHUR & MURPHY,
Engineers.
T. F. ACHESON,
Secy. Treas.

27 28

VILLAGE of TAVISTOCK

Tender
for Pumping Equipment

Tenders will be received up to **Thursday, July 20th next,** for two half million gallon Steam Pumps, one Boiler etc.; also 1000 feet of Fire Hose. Plans and specifications may be seen at the office of either of the undersigned.

The lowest or any tender not necessarily accepted.

F. W. FARNCOMBE,
Consulting Engineer, London.
J. G. FIELD,
Clerk of Tavistock,
Tavistock.

27-28

(Continued from page 61)

Three storeys, 36 x 65, two stores on ground floor, apartments on second floor, public hall third floor. Excavation has commenced.

Equipment required for factory. Owners, McGlashan Clarke Co., Niagara Falls, Ont. Required, punch presses, rolls, etc., etc., suitable machinery for spoons and cutlery.

Fort William, Ont.

Contemplated assembling warehouse, $100,000. Owner, Canadian Harvester Company; 300x90, solid brick. It is learned on good authority that the above company are arranging to erect a warehouse here. Enquiry being made for materials.

Ladner, B.C.

Subsidiary plant to be established; manufactury. Owner, Fraser Valley Tile and Cement Co., New Westminster. The intention of this company to establish a branch at Ladner for the manufacture of cement tile is announced. This tile is much in demend for draining the delta land of the Fraser Valley.

North Bay, Ont.

Tenders called for business block, $6,000. Owner, L. Bunyan, North Bay. Architect, H. W. Angus, North Bay. 2-storey 34x48, brick, stone foundation, hot water heating, electric lighting, cut stone, structural iron, sheet metal work, metal ceiling, cornice, iron columns, roofing, pipe covering, plate glass, vaults, skylights, interior finish pine. Tenders were called for all but heating and plumbing until July [illegible]

New Westminster, B. C.

Machinery required for factory (Sapperton, B. C.) Owner, Fraser Valley Tile and Cement Co., Ltd. Acting manager, S. C. Cook; Supt., J. Witchell; sec.-treas., C. A. Sutherland. Recently organized through the People's Trust Co., New Westminster. Company in the market for machinery for manufacture of cement blocks and tile; plant to be run by electricity; 26 lots have been purchased in Sapperton with valuable deposits of fine sand and gravel. The company will have also cement, etc.

Ottawa, Ont.

New industry. Thos. Wm. Lehoe, of Fort Wayne, Ind., formerly of Ottawa, is promoting a scheme for the establishment of a large automobile concern here.

Parry Sound, Ont.

Equipment required for pumping plant, $2,000. Owners, Canada Chemical Co., 510 Manning Chambers, Toronto. Required, two or three stage turbine electrically driven pumps, 6 in. rotary chamber and motor, for fire protection. This company is entitled to fire protection from town. The proposal is to install a pumping plant instead of extending a water main. Negotiations in progress between the town and the company. Information obtained from the company.

Regina, Sask.

The John Deere Plow Company are seriously considering the location of their plant here. W. H. Hutchinson, managing director, Winnipeg branch, 10 Princess street.

Swift Current, Sask.

International Lumber Yard, Swift Current, partially destroyed. A brick office will be built.

Destroyed by fire, two buildings. Great Northern Supply Co., Swift Current, Sask. On the 17th the G. N. Supply Company's building (hardware, machinery, harness, etc.), was destroyed by fire, loss $75,000, $30,000 covered; reconstruction not decided.

Saskatoon, Sask.

Warehouse and office building. The Western Canada Saw Mills, Ltd. The having plans prepared by Neil McKinnon, for the erection of a 2-storey warehouse and office building, 52 x 70 feet. Also for new residence for W. F. Watson, general manager of the company.

Plans prepared for business building. $60,000, 22nd street and Second avenue Owner, Herbert Weston; architects, Thompson, Daniel & Colthurst. Brick fireproof construction. The architects are also calling for tenders for the new manse for Knox Presbyterian Church, $10,000; also preparing plans for a residence for Mayor Clinkskill.

Toronto, Ont.

Tenders called for fence and entrance gate. Owner, City of Toronto; F. S. Spence, chairman, board of control. Iron fence and entrance gate for high level pumping station. Plans, etc., obtained from the waterworks department, office of City Engineer, Toronto.

Toronto, Ont.

Heating, lighting and plumbing, etc., required for store, $30,000 (Yonge street between Shuter and Wilton). Owner, Art Metropole Ltd., Yonge street, Toronto. Architects, Mitchell & White, 55 Isabella street, Toronto. 4-storey, 123x22, brick, steam heating, combina-

[illegible] lighting, open plumbing, freight elevator, ornamental iron and copper, cornice, electrical bells, plate glass, prismatic glass. Tenders for heating, lighting and plumbing open about two weeks; those for elevator will be called in a month's time.

Tenders called for store, $3,500, 494 Bloor street. Owner, H. G. MacKenzie, Toronto; architect, A. G. Strathy, Ltd., 123 Simcoe street, Toronto. Three storeys, 50 x 18, brick, brick foundation, hot air heating, combination lighting, felt and gravel roofing. Tenders received until July [illegible]

Tenders to be called for alteration to building (new front), $5,000, King street west. Owner, Trust & Guarantee Co., King street west, Toronto; architect, Darling & Pearson, Leader Lane, Toronto. Two storeys, front brick, hardwood finish, brick terra cotta, reinforced concrete, structural iron, plate glass, rolled steel frame and sash. Tenders will be called in a week.

Tenders called for three stores, $9,000. Owner, R. C. Bustard, 21 Heath street, Toronto; architect, J. Hunt, Stanford, Yonge Street Arcade, Toronto. Two storeys, 45 x 58, brick, hot water heating, combination lighting, felt and gravel roof, tile, mantels, metallic lath, skylights, electrical work, steel beams, plate glass, cornice. Tenders received until July 8th.

Vancouver, B.C.
The garage of W. Bauer, Georgia st., was destroyed by fire on the 18th inst. About 23 automobiles were destroyed. Headquarters for Everett and Tudhope cars.

Woodstock, Ont.
The necessary capital for the commencement of an automobile factory is stated to have been subscribed. Mr. Thorpe, representing Clark Automobile Co., of Detroit, is interested.

Woodstock, N.B.
The machine shops of Small & Fisher destroyed; heavy loss; small insurance.

Windsor, Ont.
Factory building, $15,000. Owner, National Spring & Wire Co., Windsor. Contract for new Windsor factory building, 90x140 ft., reinforced concrete, awarded to Delisle, Culbertson, Winchester Co., 430 Penobscot building, Detroit, Mich. Work will be started within a few days.

CONTRACTS AWARDED

Brantford, Ont.
Stores and apartments, $9,000. Owner, Dr. J. W. Robinson, Brantford. Architects, Taylor & Taylor, Brantford. Contractor, N. Kew, Brantford; 3-storey 40x56, brick, stone and concrete, hot air heating. Heating and plumbing contracts not let yet. Contract awarder June 28. Building to be completed Nov. 1st, 1911.

Bank and office building, $30,000. Owner, Royal Loan & Savings Co., Brantford. Architects, L. D. Barber & Chapman, McGiffen Association, Brantford. General contractor, P. H. Secord & Sons, Brantford. Heating and plumbing not let yet.

Medicine Hat, Alta.
Office, $10,000. Owner, M. Cousin, Medicine Hat. Architect, Mr. Trimble, Medicine Hat. General contractor, Morton Fulton, Medicine Hat; masonry, Geo. Worthy, Medicine Hat. 2-storey, brick. Building to be completed Oct. 1st.

Montreal, Que.
H. Kellert & Sons, Royal Bldg., have awarded contract to C. E. Deakin, for a 4-storey, light mfg., building, concrete and terra cotta, 75x120 on St. Catherine street, $50,000.

Office building, $18,000, Lagauchetiere street. Owner, Wilson Carbon Paper Co., Craig street general contractor, Church, Ross & Co., 22 St. John street, Montreal. Excavation and brick work, J. Morrison, 207 Guy street, Montreal. Three storeys and basement, reinforced concrete, 32 x 70.

Orillia, Ont.
Addition to factory, . $15,000. Owner, National Hardware Co., Orillia. Architect,, J. H. Robertson, Orillia. General contractor, E. Webb, Orillia. 2-storey, 45x100x34, steam heating. Contract let June 27th. Contract for heating and plumbing not let yet.

Victoria, B. C.
Site purchased for department store, (Fisguard and Herald). Owners, Hudson's Bay Co., London, England; sec., W. Ware. Sale effected by Messrs. Grant & Lineham. Land purchased front 240 ft. on Douglas street and 120 on Fisguard and Herald streets

Vancouver, B. C.
The terra cotta contract for Dominic Burns Bldg., Granville street, is stated to have been let to the Ladding & McBean, Los Angeles, Cal., $60,000; Parr & Fee, architects.

Power Plants, Electricity and Telephones

Blyth, Ont.
By-law carried for electric light. Owners, Village of Blyth; clerk, A. Elder, Blyth. Authority given to buy electric light plant and extend fire protection.

Brandon, Man.
Equipment required for street lighting, $15,000. Owner, City of Brandon; city engineer, R. E. Speakman, Brandon. 150 electric light standards and connections. In response to petition of citizens,, City will advertise standard system of lighting as local improvement. City Engineer will recommend purchase of 100 5-light standards at $150 each. G. A. Patterson, engineer, dynamos and motors.

Edmonton, Alta.
By-law defeated for power development, $100,000. Owner, City of Edmonton, Alta; city engineer, A. J. Latornell, Edmonton. The by-law to provide for initial work on the municipal power plant at Grand Rapids, north of city, was defeated.

Tenders to be called for electric lighting. Owner, Corporation of Edmonton, Alta. (Electric Light Department). Superintendent, light and power, A. W. Ormsby, Edmonton; superintendent power house, Mr. Huffman, Edmonton. The city is also considering installation of ornamental standards on three or four of principle streets. For further information apply to Mr. Huffman. Contract for installation of 75 magnatite arc lamps to be erected throughout business section of city will be awarded shortly.

Galt, Ont.
Tenders called for purchase of debentures. Owner, town of Galt, Ont. Chairman finance committee, A. M. Edwards, Galt. Cost of plant to distribute electric power, $25,000, 20 years at 4½ per cent re-payable June 5th, 1931. Interest payable semi-annually on December 5 and June 5 at office of town treasurer or Merchants Bank of Canada, Galt.

Hamilton, Ont.
A by-law will be submitted on July 25th to raise $505,160 for the purpose of hydro-electric power and light distribution.

Medicine Hat, Alta.
Contemplated, new natural gas well, $10,000. Owner, City of Medicine Hat, Alta. equipment that will be required: Well drillers. Location not decided, being discussed. This work has not yet been authorized, but is probable.

Nelson, B.C.
Application for license for power purposes. District Water Commissioner, W. F. Teetzel; A. L. McCulloch, mining engineer, Nelson, has made application for license to use 6,300 feet of water for power purposes from the Kootenay River at Granite. The parties behind the project, although names have not been disclosed, are understood to be strong enough financially to carry the work through. Alternative proposition, Mr. McCulloch has also recorded a similar amount of water at Slocan Junction, five miles below Granite.

Orillia, Ont.
By-law to be submitted for power development, $80,000. Chairman water, power and light committee, councillor Curran. $15,000 for line between Big Chute and Ragged Rapids, etc. Additional equipment rendered necessary by increased load as follows: Transformer equipment, recording meter, etc., at Big Chute, $5,000; transformers (step down) in Orillia sub-station, $4,000; switching and controlling apparatus, switchboard, meters, etc., $5,000; lightning protection appartus, $900; motor and equipment for operating sluice valves in dam, $750; air compressor, for cleaning generators. $500; additions to equipment at Ragged Rapids, $350.

Prince Albert, Sask.
Time for tenders extended for power works. Owner, City of Prince Albert; sec.-treas., C. O. Davidson; A. Holmes, mayor; engineers, C. H. & P. H. Mitchell, Traders Bank Building, Toronto, Ont. Construction of power station superstructure and transmission line part of proposed hydro?electric power development, 25 miles east of city. Plans, etc., after June 9, at City Hall, Prince Albert, offices of Canadian Engineer, Winnipeg and Montreal; and at office of the engineers. Tenders on electrical equipment extended until July 15th; received by C. O. Davidson.

Miscellaneous

Edmonton, Alta.
Tenders called for fire hose. Owner, Corporation of Edmonton, Alberta.

(Continued on page 66)

BOILERS

Fitzgibbon Type of Boilers built for McLachlin Bros., Arnprior, Ont.

BOILERS, of All Kinds for Any Service

"Inglis" Boilers are Designed and Built by Skilled and Experienced Workmen.
"Inglis" Boilers are Built of the Best Material that can be procured.
"Inglis" Boilers are Made in Shops Equipped with the Latest and Most Modern Machinery.

Workmanship, Quality, Quick Delivery and Fair Prices, together with Fifty-Two 52 Years' Practical Experience, have made "INGLIS" Boilers the "Standard." Write us for prices.

The John Inglis Company
Limited
Engineers and Boilermakers
14 Strachan Ave., TORONTO, Canada

(Continued from page 61)

City engineer, A. J. Latornell, Edmonton. Tenders called for 5,000 feet of fire hose by city commissioners. Sample of hose 6 in. long to accompany each tender.

Goderich, Ont.

The contract for construction of new sewerage system was awarded to Peter Nicholson, Monkton, Ont., $22,150.45.

Guelph, Ont.

The contract for paving Oxford street from Norfolk street to Glasgow street at $1.52 per square yard, was awarded to the Tarlithic Paving & Construction Company.

Medicine Hat, Alta.

By-laws carried for industries and fire engine. City Engineer, A. K. Grimmer. The following by-laws were carried: Auto Fire Engine and apparatus, $10,500; J. H. Preston Planing Mill, 4 acres of land on industrial site; electricity at manufacturers' rates, etc.; Medicine Hat Milling Co. 150,000 ft. of gas every 24 hours free of charge for 5 years, etc. May or Milne.

Ottawa, Ont.

The following permits have been granted recently: A. J. Cawdron, residence, Marlborough avenue, G. Bannister, builder, $4,500; William Fields, dwelling, Stewart street, $3,500; Fred Diamond, apartment, Frank street, $10,000, and tenements $14,000; James Walters, dwelling, Sophia street, $8,000; J. M. Garland & Son, warehouse, A. L. Weeks, architect, and Alex. Garvok, builder, $30,500; John Heney & Son, coal shute, Catharine street, $18,000; A. B. Foster, dwelling, N. Hollister, builder, 2nd avenue, $5,000; Caleb Chambers, dwelling, Drummond street, $3,000; F. Lefaiber and V. Boisvert, dwelling, Oak avenue, $2,500; J. S. J. Routhier, dwelling, Botellier street, $2,800.

C. P. Meredith is preparing plans for a residence for E. Barrett on Carling avenue. It will be solid brick, to cost about $6,000; C. P. Meredith, architect, is preparing plans for a residence for D'Arcy McGee on Marlborough avenue which will cost about $15,000.

J. A. Ewart is preparing plans for the factory for Rolla Crain Ltd., to be built on Spruce street. It will be a one-storey brick building covering nearly two lots.

J. W. H. Watts, architect, has prepared plans for a synagogue to be erected on Rideau street. It will cost about $15,000. A. Sugarman is calling for tenders.

The city treasurer has been authorized to call for tenders for city debentures aggregating $515,500. Ocers will be received up to September 24th.

St. Thomas, Ont.

Contract waarded for reinforced concrete coagulating basin. City engineer, M. H. Baker; contractor, G. A. Ponsford, St. Thomas, $4,990; capacity 400,000 gallons waterworks, others tendered: Perth Contracting Co., Stratford, $5,157; L. M. McCandless, Sparta, $7,216; Roger. Bids opened June 27.

Tavistock, Ont.

Tenders called for pumping equipment and fire hose. Owner, Village of Tavistock, Ont.; clerk, J. G. Field; consulting engineer, F. W. Farncombe, London. 2 half-million gal. steam pumps; 1 boiler, etc.; also 1,000 ft. of fire hose. Plans, etc., at office of clerk engineer. Tenders received until July 20th. Advertisement in "Tenders and For Sale Department" of this issue.

Toronto, Ont.

Tenders called for fire-fighting equipment Owner, City of Toronto; F. S. Spence, president of the council. Equipment required, fire hose, motor driven combination chemical engine and hose wagon, fire alarm boxes, and wire and cables for fire alarm telegraph. Specifications, etc., upon application at office of fire department, Richmond street. Fire hall tenders received until July 4th by F. S. Spence.

Vancouver, B. C.

Fire hose (5,000 ft. 2½-in. with couplings). Owner, City of Vancouver, B. C.; W. McQueen, city clerk. Successful tenderers, Vancouver Rubber Co., 526 Beatty street, Vancouver. 2,500 ft. "Eureka" $1.25; Canadian Consolidated Rubber Co., Homer street, Vancouver, 1,000 ft., "Squelcher" $1.05; Dunlop Tire & Rubber Goods Co., 359 Water street, Vancouver, 1,000 ft. "Imperial" $1.15; Goodyear Tire & Rubber Co., 1213 Granville street, Vancouver, 500 "Magnet" $1.00; W. L. Brown, 570 Granville street, Nil.

Winnipeg, Man.

Recent permits include: H. A. Walley, dwelling, Grosvenor avenue, $4,000; W. B. Chambers, stores and apartments, Sargent avenue, $2,600; G. H. Vowles, dwelling, Wolseley avenue, $2,800; Children's Hospital extension, Main street, $40,000; Andrews & Son, dwelling, Grosvenor avenue, $8,000; W. G. & T. G. Blakeley, two brick dwellings, Polson avenue, $10,000; C. W. Fanthorpe, dwelling, Burrows avenue, $2,200; A. J. Anderson, dwelling, Evanson street, $3,000; J. D. Watson, two dwellings, Rosedale avenue, $6,000; P. Czarkowski, dwelling, Slater street, $1,700; F. Spaven, two dwellings, Magnus avenue, $2,800; H. Picken, dwelling, McAdam avenue, $4,500.

New Companies

The Willcox Lake Brick Co., Ltd., Toronto, inc. with capital of $100,000, to carry on business of manufacturers and dealers in supplies etc. Prov. directors, John F. Lennox and Chas. W. Plaxton, solicitors, both of Toronto.

The North Bay Real Estate and Development Co., Ltd., North Bay, Ont., inc., with capital of $150,000 to carry on business as a land, building and development company. Prov. directors include Geo. H. Ferguson, Barrister, of Kemptville and Jas. K. Paisley, hotel keeper, of Ottawo, Ont.

Death and Watson, Ltd., Toronto, Ont., inc. with capital of $40,000 to carry on business of electrical and contracting engineers, manufacturers of electrical machinery, etc. Prov. directors, Norman P. F. Death and Lionel Watson, electrical engineers, both of Toronto.

The Beeton Telephone Co., Ltd., Beeton, Ont., inc. with capital of $75,000 to carry on business of a telephone Co. in townships of Mulmur and Mono, in counties of Dufferin and townships Adjala, Tecumseh, Tossorontion, Essa, West Gwillimbury and Innisfil in county of Simcoe. Prov. directors, David S. Morrow, druggist, and Andrew G. Gaul, both of Beeton.

The Columbia River Lumber Company, head provincial office 18 Hastings street, Vancouver, incorporated, with a capital of $500,000, to manufacture and deal in lumber and wood products. Robie Lewis Reid, K.C., attorney for the company.

The Yahk Lumber Co., Ltd., Yahk, East Kootenay, B.C., incorporated, with a capital of $50,000, to carry on a real estate lumbering and general contracting business.

Geo. C. Salt Lumber Co., Ltd., Vancouver, B.C., incorporated, with a capital of $50,000, to carry on a saw planing mill and general lumber business.

Princeton Lumber Co., Ltd., Princeton, B.C., incorporated, with a capital of $50,000, to carry on business as lumber dealers, bridge and dock builders, etc.

Mount Lehman Lumber, Timber & Trading Co., Ltd., Mount Lehman, B.C., incorporated, with a capital of $30,000.

National Real Estate and Investment Co., Montreal, Que., incorporated. $2,000,000 to carry on business of building construction real estate, etc. Incorporators include Richard T. Heneker, K.C., Alex. H. Duff, and Walter Seely Johnson advocates, all of Montreal.

The MacLumber Co., Ltd., West Lorne, Ont., inc. capital, $50,000 to carry on business of timber merchonts, saw mills, etc., heat office, West Lorne. Incorporators, Arch. McKillop, Daniel McKillop and Hugh C. McKillop, all of West Lorne.

Business Notes

The Ontario Sewer Pipe Co., Ltd., of Mimico, have recently closed the contracts for all three sections of the North Toronto sewerage system. The whole order comprises about 350 carloads or about 45 miles of pipe running from 8 in. to 24 in. in diameter.

The Fort Fraser Land Co., 541 Hastings street, Vancouver, incorporated, with capital of $500,000, to carry on business of lumber and timber merchants, sawmill owners, to build and operate pulp and paper mills, factories, etc. D. Whiteside, Registrar of Joint Stock Companies.

The Bishop Construction Co., Ltd., Traders Bank Building, Montreal, have been awarded the contract for new Herald Building, corner Craig and St. Alexander streets. Building to be seven storeys with 12,000 sq. ft. floor space. Material, reinforced concrete, brick and terra cotta. David R. Brown and Hugh A. Vallance, architects.

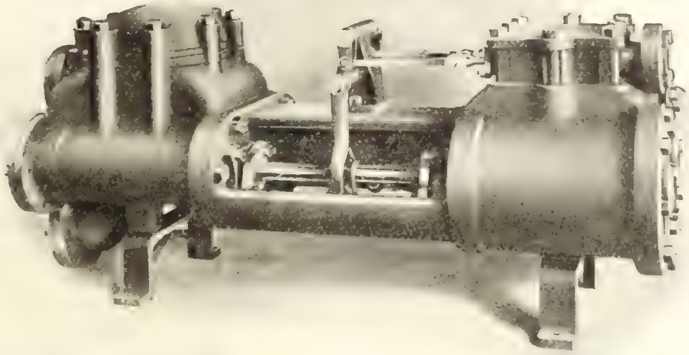
MacLean Daily Reports

The only systematic method yet devised for reporting BUILDING AND ENGINEERING projects from their inception to completion. Ask us for Rates and Specimen Reports.

220 King Street West - TORONTO

BOILER FEED PUMPS

We have a large number of International Steam Pumps' for boiler feeding purposes good up to 70 h.p. in stock ready for immediate shipment from our

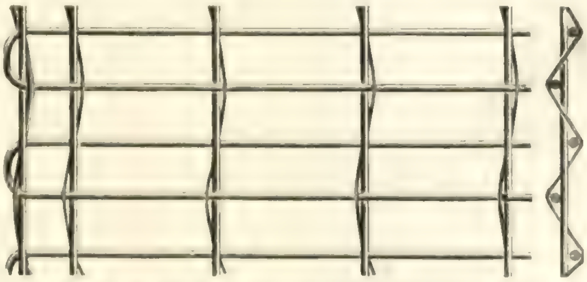


WORKS: **512 WILLIAM STREET, MONTREAL**

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.
LIMITED

LOW PRICES - HIGH QUALITY
QUICK SHIPMENT

Quality considered there is no wire lathing on the market cheaper than Greening's Wire Lathing. And our splendid, well-organized facilities and big output enable us to be unusually prompt in the shipment of large or small orders.



Greening's Trussed Wire Lathing

is a first-class plastering surface at the **Right Price.** It contains all the good features of a first class metal Lath, and eliminates many objectionale features of other types. Supplied with selvage Edge, which prevents cutting or scratching in handling, in rolls up to 100 yards. and in stock widths from 24" to 18" Other widths to special specifications.

Does not "wave" or "buckle" when unrolled and lathing may be nailed direclly along studs, joists or sheathing without furring, preventing lapping and insuring lowest possible cost of erecting.

Write further Details and Catalogue.

The B. Greening Wire Company, Limited
HAMILTON, ONT. - MONTREAL, QUE.

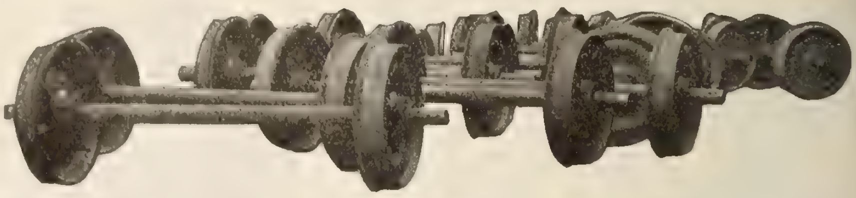
RAILWAY CONSTRUCTION PLANT

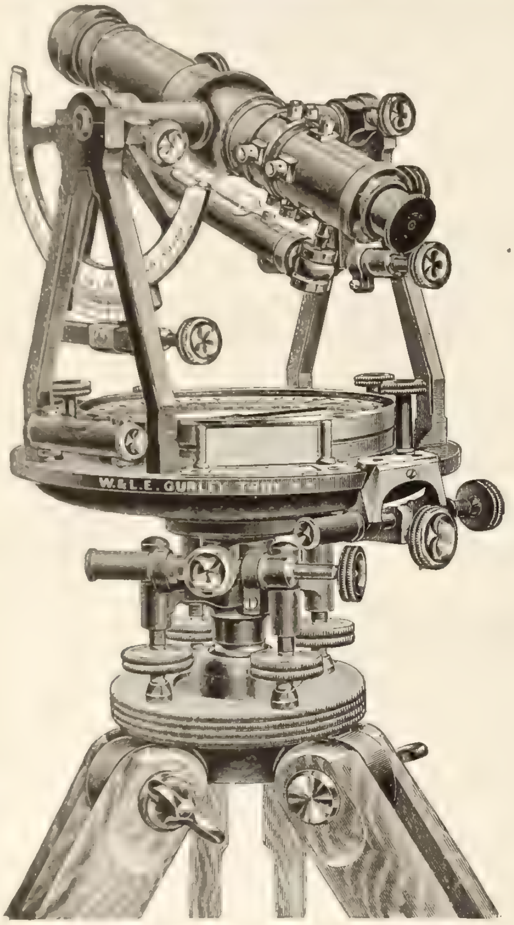
Hoisting Engines, Horse Powers, Hand Winches, Derricks, Car Wheels, Axles and Boxes, Dump Cars, Rail Cars, Buckets

MARSH & HENTHORN, Limited
Makers of Hoisting Machinery, BELLEVILLE, ONT.

Send for Catalogue

SALES AGENTS
MUSSENS
LIMITED
Montreal, Que.





1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

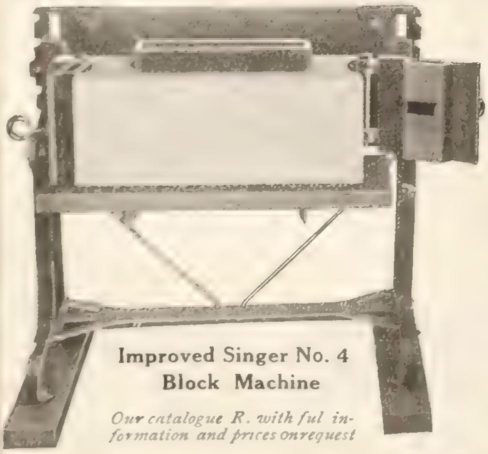
Transits	Current Meters
Y Levels	Levelling Rods
Compasses	Chains
Plane Tables	Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.



Improved Singer No. 4
Block Machine

Our catalogue R. with ful information and prices on request

It Makes

Face Down Blocks

Blocks 4", 6", 8" 10" 12", 16" and 20" long. 4", 6", 8", 10" and 12" wide.

All Blocks on One-size Pallet.

Sold in combination to suit purchaser at reasonable prices. Guaranteed against defect in material or poor workmanship.

Vining Mfg. Co.
Niagara Falls, Ont.

Tenders

A few dollars spent in advertising your proposals in

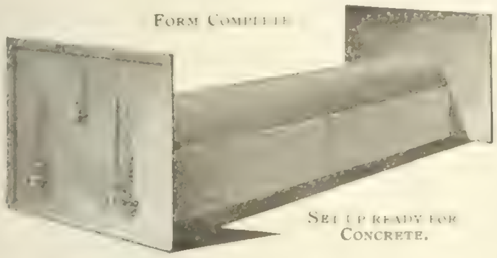
The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.



Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

WRITE FOR FORM CATALOGUE
ENGINE CATALOGUE FOR THE ASKING
COMMISSIONER'S TIME BOOK FREE

Concrete Form & Engine Co.

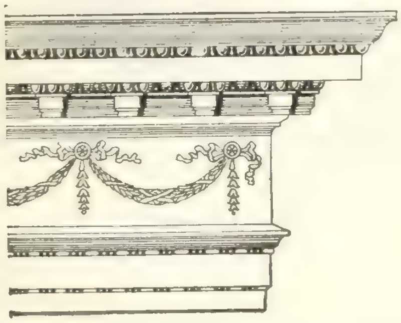
Successor to Collapsible Steel Form Co.

83 Congress St. W., Detroit, Mich.

"A good appearance is a letter of recommendation—a house well built, a monument to the builder."

Superior Quality Material and Workmanship Count

Metallic Cornices



are the MOST ARTISTIC, MOST DURABLE and MOST EASILY ERECTED cornices you can place on any building.
They are made of sheet copper or galvanized steel and are absolutely rust proof.
"Metallic" cornices can be furnished in any design desired to suit your drawings and specifications.
Let us give you prices and full information--send us your specifications. Our catalogue of sheet metal building materials, No. 70, will interest you. Write for it.

Manufacturers 195

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

The Smith Marble and Construction Co., Ltd.

Montreal

Office & Factory:
145 Van Horn Ave.

Show Rooms:
458 Blury Street

**Importers,
Manufacturers,
Contractors**

OF

Interior and Exterior Marble, Slate, Floor and Wall Tiles, Mosaics, Plumers and Electrical Marble, Granites for Building and Monumental Work.

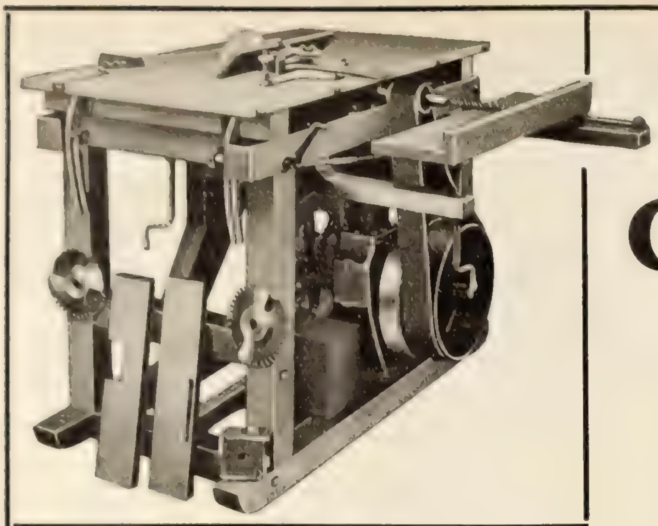
Bryan for Doors

We manufacture a line of high class doors for all parts of house finish. Our interior trim and fine interior hardwoods will give the building they are put into an artistic finish.

Send us your specifications for [illegible]

The

BRYAN Manufacturing Co.
Limited
Collingwood, Ontario



On Every Concrete Job

You can save 10 to 15 per cent by using our Contractor's Portable Saw and Variety Woodworker.

Now is the time when you are starting to do your concrete work and this saw will be just what you are looking for—a cheap practical saw that will prove itself a time saver and money maker for you.

CONTRACTORS SUPPLIES OF ALL KINDS

The
Canadian Fairbanks Co., Limited

Fairbanks-Morse Gas Engines, Fairbanks Scales. Safes and Vaults.

Montreal Winnipeg Toronto Vancouver
St. John, N.B. Calgary Saskatoon Ottawa

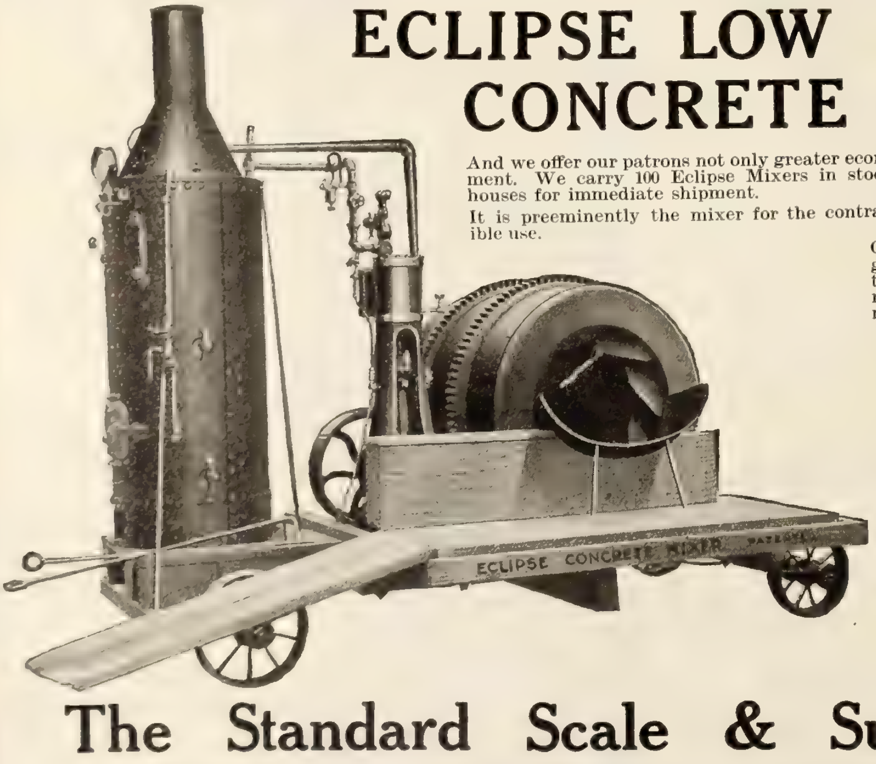
WHAT IT IS

A Rip Saw
A Matcher
A Mitre Saw
A Cut-Off Saw
A Dado Machine
A Jointer
A Boring Machine
A Gaining Machine
A Grooving Machine
A Babbitting Machine
A Moulder with Self-Contained Power

You Can Pay for the Mixer on a Single Job by the Greater Economy of Operation

It is not alone the saving of 1-3 in first cost, 1-2 in power, one man to operate the hoist and 2-3 the delays and repairs, but the greater portability enabling it to always be kept at the most convenient position on the job for rapid work that are the distinguishing features of the

ECLIPSE LOW CHARGING CONCRETE MIXERS



And we offer our patrons not only greater economy of operation but unequalled service in shipment. We carry 100 Eclipse Mixers in stock at our factory, stores, warehouses and branch houses for immediate shipment.

It is preeminently the mixer for the contractor because it saves money in nearly every possible use.

O new 1911 catalog No. 45 is just off the press and gives full information how to handle the Eclipse to obtain best results. Write for it. Our testimonial booklet explains how other contractors are making money by using the Eclipse Mixer.

You Can Buy the Small Size Eclipse Batch Mixer Complete with Power at a Lower Price than a Continuous Mixer.

MANUFACTURED BY

The Standard Scale & Supply Company

CHICAGO
1345-1347 Wabash Avenue

PITTSBURGH
243-245 Water Street

PHILADELPHIA
35 South Fourth Street

NEW YORK
136 West Broadway

The Elmitt Lumber Co. Limited, Ottawa, Ont.

Specialize in

Southern Pine Timber and Piles

Also

Fir, Hemlock, Spruce, Pine and Oak Timber and Lumber

N. B.—Can supply 10,000 Green Tamarac Piles.

TENTS

for Engineers and Contractors

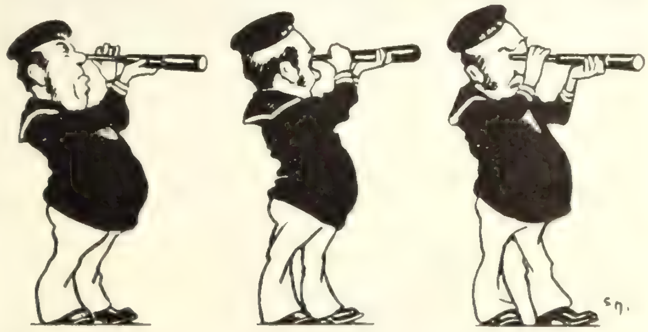
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

Woods Limited

Woods Building - Ottawa, Ont.



Looking for Business

Then our DAILY REPORT SERVICE will help you. Our organization provides the only systematic method yet devised for reporting Building and Engineering projects from their inception to completion.

Special facilities for gathering news of sales opportunities in machinery, equipment and materials required.

Ask us for further information. Let us send you rates and specimen reports.

MacLean Daily Reports Limited

220 King St. West
TORONTO ONTARIO

INDUSTRIAL - CONTRACTORS - EQUIPMENT

Lifting gate End Dump Car

We make these any guage, any size, style and number.

We make chutes of all kinds. For chuting concrete—coal—sand—anything.

Write for our Catalog No. 31-A

We make a specialty of Heavy Sheet Steel work.

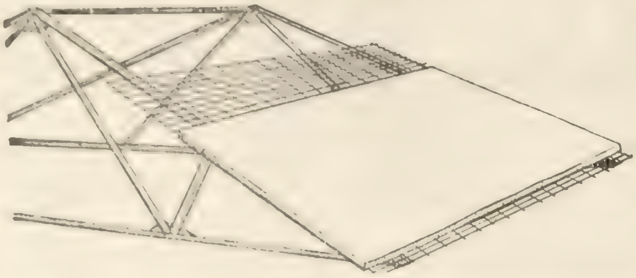
High Quality
Low Prices
Quick Shipments

SACKETT - CHICAGO

Gable bottom car, all sizes.

1691 Elston Ave., Chicago, Ill.

Concrete Reinforcement



Our Bonding is a Crimped STEEL WIRE Fabric

Can be made in any Length or Width to suit you.

We claim in the erection of roofs and floors our continuous reinforcement has no superior, inasmuch as it knits the entire mass into an actual monolithic slab, weak at no point and so tied together that in case of accident from any cause whatever, no single section would fall but would be sustained by carrying capacity of wires running in continuous lengths over top of roof trusses or purlins

Inquiries Solicited

When in Need of—

Ornamental

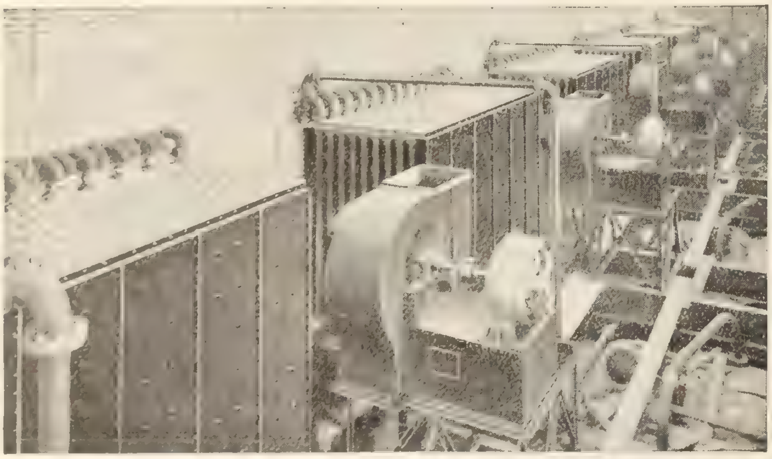
Wire and Iron Work

SEND US YOUR ENQUIRIES

We specialize in

Jail and Prison Work

Canada Wire Goods Mfg. Co., Hamilton



At the Power Plant of The Denver Tramway Co.

are installed

6 **Sturtevant** Metal-to-Metal Joint Economizers. *No Gaskets.* Capacity 300 Lbs. Pressure.

6 **Sturtevant** Multivane Induced Draft Fans direct connected to

6 **Sturtevant** Commutating Motors.

All working in connection with 6 Sterling Boilers 4200 B. H. P.

"Economical Fire Room Methods," by F. R. Low, Editor of Power; Sturtevant Bulletin No. 187-N describes the operation and equipment of one of the most efficient and economical power plants in the world, The Wood Worsted Mills, Lawrence, Mass.; told in a most interesting manner by one of the foremost technical writers in this country. It is yours for the asking.

B. F. Sturtevant Co. HYDE PARK, MASS.

853

Eadie-Douglas, Limited, Montreal **Polson Iron Works, Limited, Toronto**

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

---

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

Celebrated

Bedford Stone

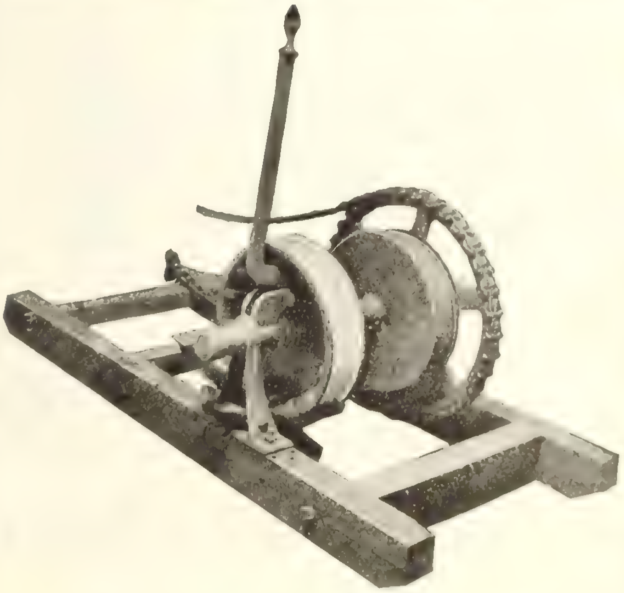
from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.

Toronto Agent
A. P. STEWARD - Builders' Exchange

DO YOU WANT A GOOD HOIST?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	**Mortar Conveying**	**Well Digging**
Bridge Building	**Sewer Building**	**Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists London, Canada

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO
Branches : Vancouver and Winnipeg
Montreal

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President
Thos. C. Irving Jr., Vice-Pres.
Jas. W. Moffat, Secretary
Chas. Warnock, Treas. & Mgr.

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, Canadian Express Bldg., Montreal, Que.
Branch Offices, Traders Bank Building, Toronto, Ont.
Norfolk House, Laurence Pountney Hill, London, E.C.

Note tremendous metal weight on this floor. Entire building of Alsen's Cement reinforced concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

for concrete reinforcement is made from high carbon, cold drawn wire. The process of cold drawing eliminates the possibility of flaws. Perfection Wire Mesh is necessarily perfect.

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

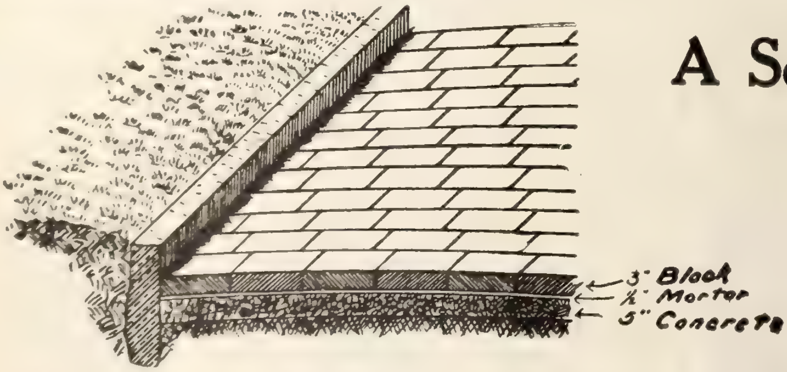
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Lap Welded Steel Pipe

MADE IN SIZES

12 to 72 inches Diameter

Used extensively for Water Supply for Mines, Mills, Hydraulic Operations and High Pressure Hydro Electric Installations.

Ask our Welded Pipe Dept. for prices.

American Spiral Pipe Works

MANUFACTURERS OF

SPIRAL RIVETED PIPE LAP WELDED PIPE
FORGED STEEL FLANGES

50 Church St. New York Box 485 Chicago, Ill.

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)
"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."

W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.

1032 Garfield Building, CLEVELAND, OHIO

SELLING AGENTS

The Dominion Equipment & Supply Co., Winnipeg, Canada

HOW ABOUT IT?

Just listen to the wonderful advantages of incorporating in your concrete.

Guelph Hydrated Lime

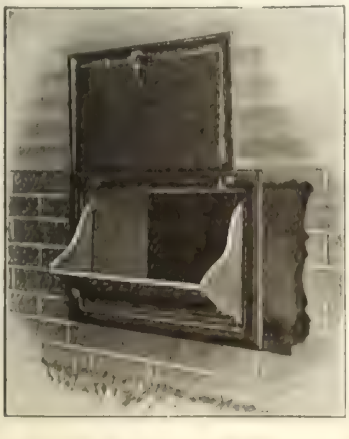
1.—The concrete works easier under the trowel
2.—It finishes easier.
3.—It improves the color of the finished work
4.—It makes the concrete more impervious to water
5.—It greatly improves the strength

The above are not five fancy ideas but five established facts.

Specify **Guelph Hydrated Lime** when ordering from your dealer

Standard White Lime Co.

Guelph - Ontario



EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

Send for our illustrated booklet, it shows and describes our full line of Coal Chutes

The Down Draft Furnace Co., Limited

Galt, Ontario, Can.

Placing EXPANDED METAL in one of Toronto's newest and most modern fire-proof factories—the new 14-storey building of The T. Eaton Co., Ltd.

Why EXPANDED METAL Remains the World's Standard Reinforcement

Expanded Metal reinforces a concrete slab in **all directions,** without wiring or cross-bonding.

Expanded Metal with its rough, twisted strands, diamond meshes and stronger-than-welded joints, furnishes a **bond** or **anchorage** theoretically and practically perfect.

Expanded Metal strands are **flat** and **straight,** not wavy and winding—hence no "straightening out" ensues when form-work is removed.

Expanded Metal—unlike rods—when once placed is not easily disaranged. The position computed for it by the engineer is assumed and kept.

Expanded Metal is not only **cheaper** and **simpler to use** than any other reinforcement, but, taken point for point, incomparably more efficient. Do not fail to consult us about your reinforced-concrete problems.

Large, illustrated Catalogue explaning the "STEELCRETE" System just off the press. You should have a copy.

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE—FRASER AVENUE

MONTREAL
138 CRAIG STREET WEST

St. John—13 Germain St.
Quebec—153 St Paul St.
Ottawa—83 Banks St.
Regina—Black Block

Fort William—113 N. May St.
Winnipeg—334 Garry St.
Calgary—309-8th Avenue.
Vancouver—416 Pacific Bldg.

IRON STAIRS

Dennis Wire & Iron Works Co.
London, Canada Limited

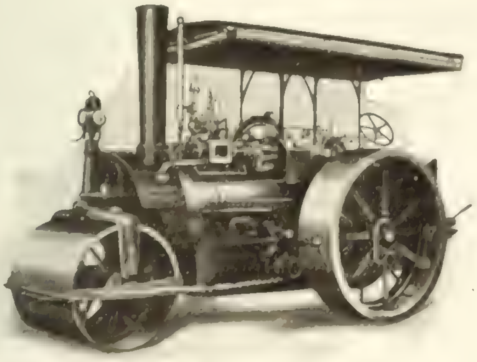
Toronto Offices - 12 QUEEN STREET E.

Cut shows a four wheel steam Locomotive Crane with 40ft. boom handling forms on New York Catskill Aqueduct at Valhalla, N.Y These contractors are finding our cranes indispensable in this work, as they can be used for so many purposes; such as handling loose materials as broken stone, sand, concrete, etc., heavy timbers, rails, concrete forms, etc.

THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City

---

There are over 100 Waterous Rollers in use in Canada to-day



The Waterous Roller
"A Canadian Roller for Canadian Roads."

That means that there is at least one in use in every province in the Dominion, working on all kinds of roads, under all sorts of conditions. Their universal success proves their right to the title "The Canadian Good Roads Pioneer."

The Waterous Roller is built in three sizes, 10, 12 and 15 tons. Carries a double crank engine, a quick-steaming locomotive type boiler of large capacity has two speed gearing cut from the solid steel for fast and slow work. Supplied with all standard engine and boiler fittings.

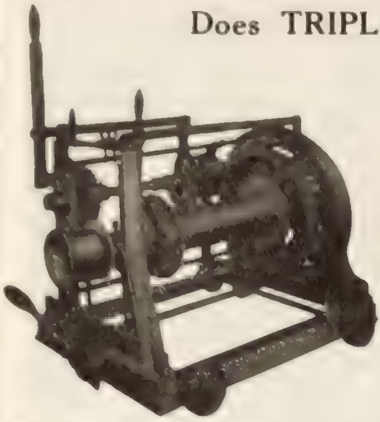
If there is no Waterous Roller in your neighborhood, write for our complete Roller catalogue No. 301 or visit us at our Brantford works and see the Roller being build and tested—a practical demonstration that is its best selling argument.

The Waterous Engine Works Co., Limited

Brantford - Canada

The Parker Reversible Friction Hoist

Does TRIPLE Duty



Run with Gasoline Engine or Motor

No Experienced Operator Required

Drum, Elevator Sheave, Winch-head all operate independently of each other, and are each reversible. This hoist operates a derrick from the drum, a double cage material elevator from the sheave, and serves various other purposes from the winch-head all on one job.

PAYS FOR ITSELF ON ONE ORDINARY JOB.

"I have used your No. 100 Reversible Hoist for over 5 years. It runs like a clock and has cost me nothing for repairs."

From an Experienced Contractor.

We also build derricks, steam and electric hoists in all sizes. Sole manufacturers of the PARKER PATENTED DERRICKS.

Write for information and prices.

S. E. PARKER, 1800-2 N. Francisco Ave., Chicago, Ill.

Selling Agents:
Gorman, Clancey & Grindley, Calgary and Edmonton, Alta.
J. L. Stuart Machinery Co., Winnipeg, Man.
A. G. Langley & Co., Vancouver, B.C.

Tiffin Flushers, Sprinklers, Dump Wagons

Garbage, Street Cleaning Carts and Municipal Devices

The Most Complete and Perfect Line Made in the United States

THE TIFFIN WAGON CO.
Tiffin, Ohio

JAS. DICKSON, Pres. GEO. T. DICKSON, Vice-Pres.

Dickson Bridge Works Co.
Campbellford, Ont. Limited

Bridge over Spanish River at Massey, Ont.

Steel Bridges, Steel Buildings
Roof Trusses
and other Structural Steel

Foundry and Machine Shop in connection.
Estimates on application

Enameled Brick

FOR EXTERIOR AND INTERIOR DECORATING AND CONSTRUCTION

Used in all modern buildings where the maximum amount of light and sanitary conditions are essential

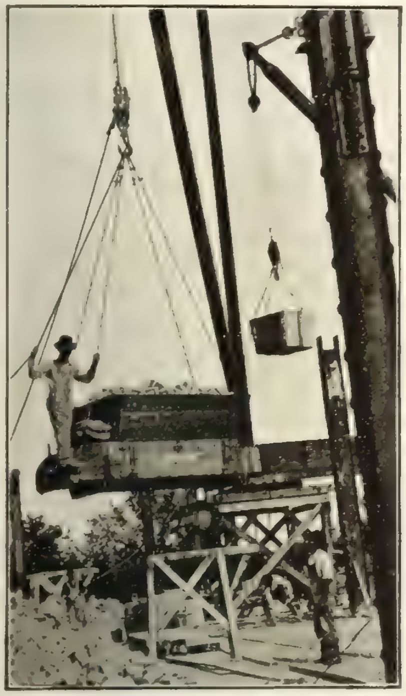
Summary of Classified List of Jobs

No.	JOBS	1st. Quality	2nd Quality
104	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,991	412,545
50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables,	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and Fire Houses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

Send for Catalogues and Color Sheets

American Enameled Brick & Tile Co.
1182 Broadway, NEW YORK CITY
Local Agents in Montreal, Toronto and Ottawa.

A Kankakee Job Tells a Story



Kankakee, Ills.
Sept. 17th, 1910.

Gentlemen,

I send you a card showing your dump box being hoisted up to the third floor of this Court House teamster and 1100 bricks.

A. SOUPAIT, Supt.

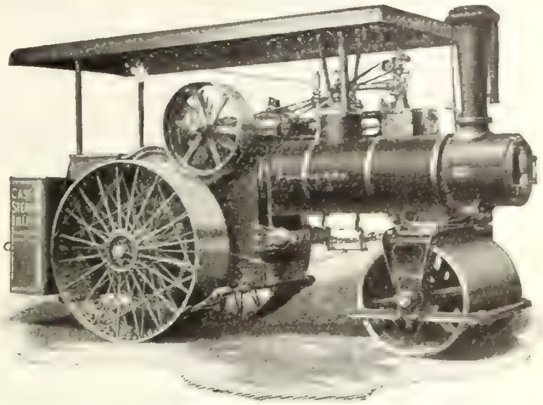
You may not want to use a dump box as a dump bucket. But if you are looking for a box that is strong and easy to handle, here's the best evidence in the world about the TROY. *And the price is Right.*

Get Bulletin 2.

The Troy Wagon Works Co.

N. Market St., Troy, Ohio.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT

THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18″ x 26″ cylinder Mogul, Standard Gauge, and 18-10″ x 14″ Vulcan and Davenport dinkeys, 36″ Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36″ Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8″ Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag-Scrapers an 4—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36″ Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW

May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED

St. James St. and Dolland Lane - - MONTREAL, CANADA

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A.

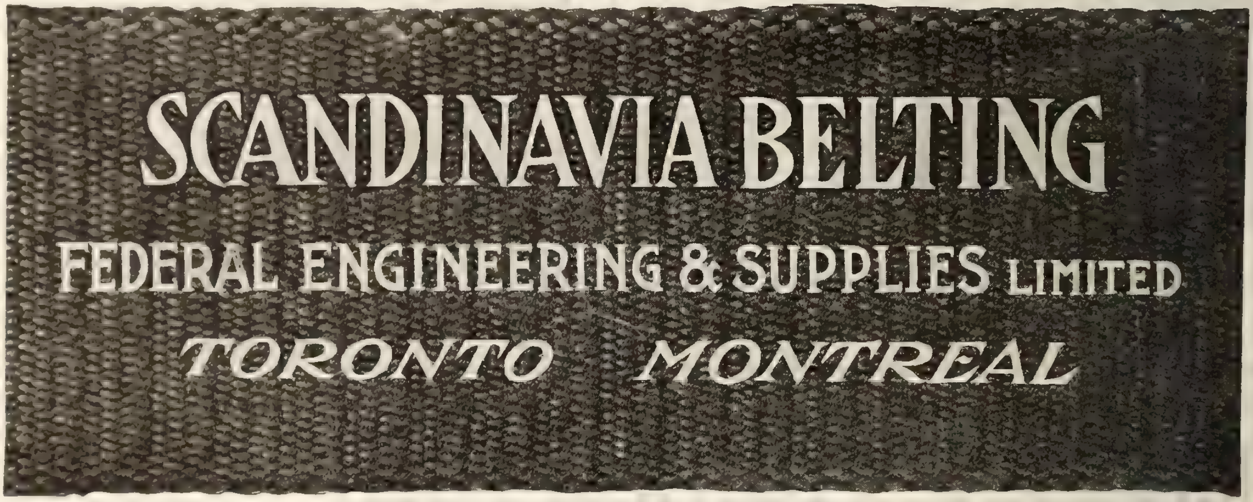
Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG



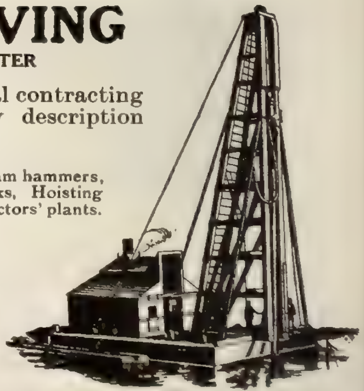
A solid woven textile belt, impregnated to resist moisture.
We guarantee this belt on any straight or crossed drives against any belting made.
It is equally good in WET or DRY places.
It is not made in plies and cannot come apart.

Inquiries solicited.

THE
Thames Quarry Co.
St. Mary's, Ont.

CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.



PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

The
Missisquoi Marble Company
Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd. - -	Toronto, Ont.
C. N. Barclay - -	Winnipeg Man.
Bosse & Banks - -	Quebec, Que.
General Contractors Supply Company, Ltd. -	Halifax, N. S.
129 Sparks Street - -	Ottawa, Ont.
James Robertson Co. Ltd. -	St. John, N. B.
G. R. Duncan - -	Fort William, Ont.
Walker & Barnes - -	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd. -	Vancouver, B. C.
315 Coristine Building -	Montreal, Que.

THE TEST FOR FIRE BRICK

GLENBOIG

Every
Glenboig Brick
bears the brand

GARTCOSH

The only reliable test for a fire-brick is in the furnace under severe conditions. The results *should* be as follows, and if the brand is "Glenboig" the results *will* be;

No Melting.
No Cracking and Spliting Off
High Reflective Power.
No Expansion or Contraction.
Immunity for hard knocks incidental to transit and furnace working.
"GLENBOIG" have stood the test.

Send for our literature

MAKER'S SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another

Tide Water Iron Works
HOBOKEN, N.J. U.S.A.

Builders' Supplies

Mouldings
Turnings
"Empire Brand"
Hardwood Flooring
Stair Building
Interior Trim
Sash
Veneered Doors
Pine Doors

J. R. Eaton & Sons
Limited
Orillia, Ontario

Sand and Gravel

Lime
Cement
Plaster
Hair
Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 604 605 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C. P. R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

RECIPROCITY

means to exchange. We have high quality fittings, you have good money. Lets get together.

S BRAND

Cast Iron Fittings and Valves are Right

"Everlasting" Blow-off Valve
SIMPLE — DURABLE — EFFICIENT

Standard Fitting & Valve Co.
Limited
GUELPH - ONTARIO

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: 34 Yonge Street, TORONTO

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES
(Installed in Toronto).

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite, 55 cents per square foot.

Viterous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 4 compression bath cock ....net $1.65

No. 4½ Fuller's ....net 2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¼ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

PAINTS AND OILS
(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, 8cc per gallon.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Brown sills and heads, in the rough, delivered, 40 cents per foot.

Rubble stone in car lots, $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered f.o.b. Toronto.

Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.

Lime, per cwt., delivered, 38 cents.

Plaster of Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

Expanded Metal, No. 10 gauge, 3½ cents per square foot.

AUTOMATIC SASH HOLDER

saves cord, weights, pulleys, and materials—no pockets—easier to install—to old and new windows. Send for sample and catalgue to-day. Agents wanted. Sold by the hardware trade or direct from 277 Broadway, New York

Automatic Sash Holder Company

Bonds of Suretyship for Officers and Employees in positions of trust.

Bonds Bid and Supply in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies

The

Guarantee Company of North America

The Pioneer Company *Established [illegible]*

Head Office - Montreal

Capital and Resources over $1 965,000
Claims Paid over - $2 265,000

No Claims in Dispute

This Company is not a party to any premium tariff combination

ARTIFICIAL STONE PAVEMENTS

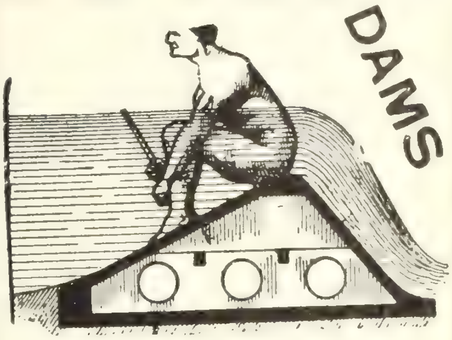
SIDEWALKS A SPECIALTY

CORPORATIONS will do well to consider our work and prices before letting contract

The Silica Barytic Stone Company of Ontario, Limited

WALTER MILLS
General Manager.

Head Office:
INGERSOLL, ONT.



AMBURSEN

Hydraulic Construction Co. of Canada, Limited.

450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.

Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty

20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.

References Given

DOMINION BRIDGE CO.

LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.

Limited

Darlington, England

Bridges

and

Steel Structures

Canadian Offices:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

—Bridge and Construction Dep't.—

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter
River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and
Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

BUILDERS SUPPLIES

**WATER
WASHED
SAND**
OUR SPECIALTY

Dealers in
Sand and Gravel
Crushed Granite
Crushed Stone

SAND
&
SUPPLIES, LTD.
TORONTO

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

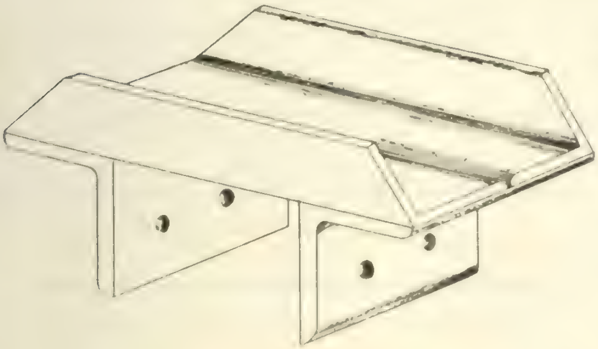
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

Portland Cement

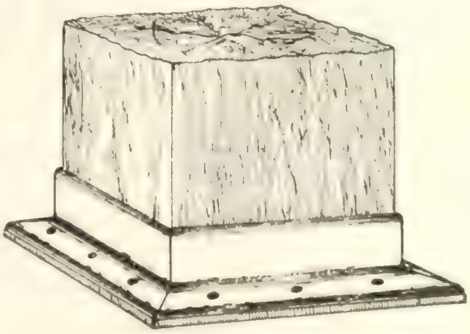
High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

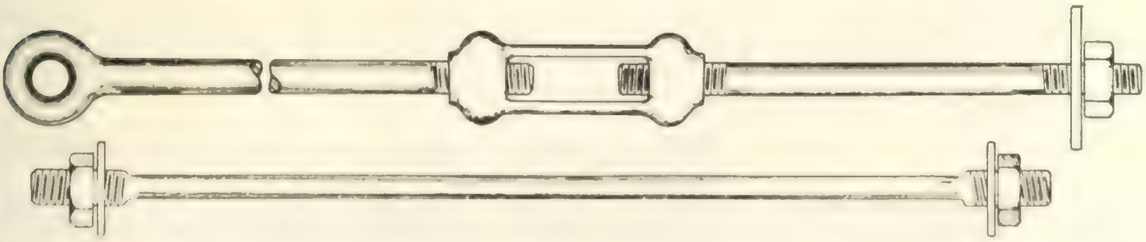
Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company Limited
Hamilton, Canada



STEEL POST CAPS
and BASES
for Wooden Posts,
any size.
Also made in
Cast Iron





EYEBOLTS, TURNBUCKLES and RODS of all descriptions

Beams, Angles, Channels, Plates, any size from 1 inch to 24 inches, and any length up to 70 feet

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O. BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President. J. G. Allan Vice-President. James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

CAST IRON PIPE

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

- Roofing Slate
- Red Slate
- Green Slate
- Mottled Slate
- Black Slate
- Blackboards Slate
- Structural and Electrical Slate
- Terra Cotta Tiles
- Asphalt Pitch
- Tar
- Asbestos Sheathing
- Building Papers
- Tarred Felts
- Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

- Glass Wired and Rough Rolled
- Galvanized Sheets
- Black Sheet
- Copper Sheet
- Tinplates
- Canada Plate
- Zinc Sheets
- Corrugated Iron
- Gutters
- Pipes
- Elbows
- Spikes
- Nails
- Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canda

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridge's Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751

405 Dorchester Street East, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.

A. M. Can. Soc. C. E. A. M. Am. Soc. C. E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 413, Pacific Block, **Vancouver, B. C.**

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { **Waterworks, Sewerage and Electric Lighting.**

Winnipeg and Calgary

John Haddin E. L. Miles

Allan Keefer

Architect

Ottawa, Ontario

Arthur L. Weeks

Architect

Canada Life Building, Ottawa

Reinforced concrete and steel structures, factories and commercial buildings

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes. "Roman" building stone. "Milton" pressed bricks. Sanitary flooring, stone crushers, fire engines, &c. T. A. MORRISON & CO. 204 St. James Street, Tel. Main 4532. Montreal.

The

Laurentian Granite Co

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g. 224 St. James St. **Montreal**

Bell Tel. M. 4354

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

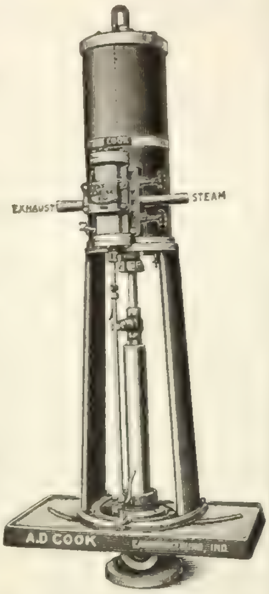
JOHN J. GARTSHORE

58 Front Street W., TORONTO

Water Supply from Deep Wells

is obtained at a minimum cost by use of our deep well pumps.

Write for Bulletin 26 explaining the use of Cook's Patent Brass Tube Well Strainer.



A. D. COOK

Lawrenceburg, Indiana, U. S. A.

Manufacturer of a Complete line of **DEEP WELL SUPPLIES** including Steam, Belt and Motor Driven **DEEP WELL PUMPS**, Wind-mill and Hand Pumps, Working Barrels and Valves, Pump Rods and Pump Rod Joints, Drill Rods and Drill Rod Joints, Drilling and Well Tools.

CATALOGUE MAILED UPON REQUEST.

PURE WATER

It is easy to obtain with our plants and apparatus

We design and contract for complete municipal filtration plants of any capacity.

We supply and install apparatus for sterilizing water supplies by the application of calcium hypochlorite.

Literature, Sketches, Estimates and Recommendations Supplied on Request

American Water Softener Co.

1001 Chestnut St., PHILADELPHIA, Pa.

We have no affiliations or working acquirements with any of our competitors.

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILE, CRESTINGS, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor

Montreal Agent: E. F. DARTNELL, 157 St. James St. **Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade**

Victoria Ave., Westmount, Quebec. "The Tarvia Modern Pavement."

Make the Roads Automobile-Proof!

Ordinary macadam is not automobile-proof. It goes to pieces rapidly under motor traffic, and the surfacing material which the engineer has put down at great cost is destroyed and blown away, necessitating expensive renewals. It is most wasteful to keep on building old style roadways and trying to maintain them under automobile traffic.

Road authorities all over the country have learned the necessity of building macadam roads with Tarvia. They have also used immense quantities of Tarvia in resurfacing them.

Tarvia reinforces the natural bond and gives to the macadam a desirable plasticity. The thrust of automobile wheels simply presses the stone down into the Tarvia matrix and makes the roads smoother.

This surface will not pulverize and create dust, and adjoining property will be greatly benefitted. Property owners in fact are frequently more than willing to stand all the expense of a Tarvia treatment to get rid of the dust nuisance. A Tarvia treatment is, however, a proper charge upon the whole community because it effects such savings in maintenance as to more than pay for itself.

The largest use of Tarvia has come about through a study of relative costs. Many road engineers now realize that it is cheaper to maintain a dustless road with Tarvia than a dusty one without it.

The use of Tarvia is based on 11 years experience dating from the experiments in France in 1900.

The experience of our experts is at the service of road authorities everywhere who want to reduce maintenance costs and add to the life of their macadam roads.

Road engineers, property owners and automobilists are invited to write for our illustrated Tarvia literature. Address nearest office.

The Paterson Manufacturing Co. Limited, Montreal, Toronto Winnipeg Vancouver
The Carritte-Paterson Manufacturing Co., Limited St. Johns, N.B. Halifax, N.S.

BEFORE AND AFTER

NO. 1.

NO. 2.

Illustration No. 1 shows the interior of the Office of Drummond, McCall & Company, Toronto, before the installation of Luxfer.

Illustration No. 2 of the same Office taken under exactly the same conditions and within the same hour, shows the efficient lighting given by Luxfer Prisms.

This is only one example in hundreds where a gloomy office has been flooded with light by the use of Luxfer.

Luxfer Prism Company, Limited
100 King Street West, TORONTO

Stop Your Building Until You've Decided on the Gas Question

?

If you are building and have made no provision for gas piping, you are making a grave mistake. You not only affect your own interests, but do an injustice to your client **Modern Gas Lighting and Appliances** hold a place in the world's progress that must not be overlooked. Your client wants the best that's going. He looks to you for the information. If you are the owner you certainly require the ideal when it comes to home comforts. If you build for renting purposes—you naturally wish to keep good tenants. Good tenants are like customers—give them good service and they stay. In Toronto nearly 70,000 homes and buildings are piped for gas light and fuel — 80% more than with all other systems combined. In Toronto, gas piped buildings are increasing at the rate of 7,000 per year. Why is it? It's because people realize that "GAS" cannot be equalled when it comes right down to quality and actual figures.

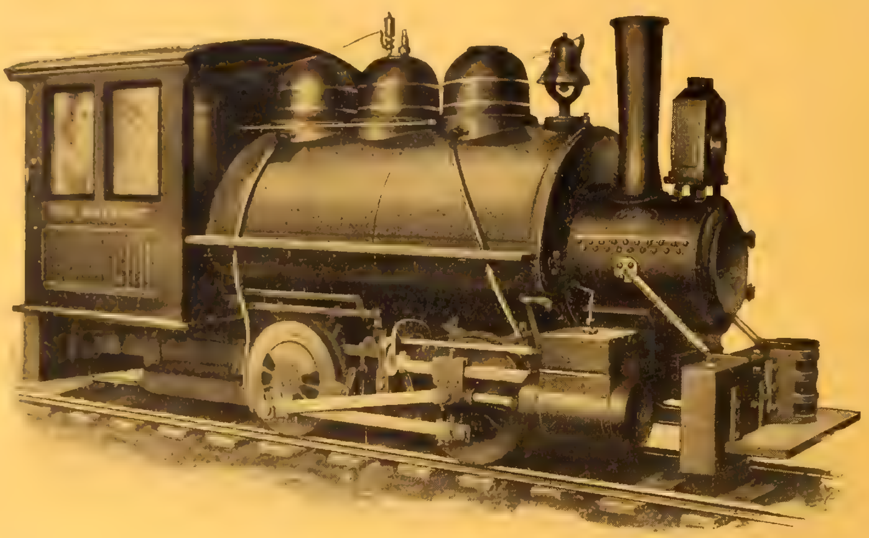
Modern Gas is a wonder. **Modern Gas Appliances** have revolutionized the gas business. We want you to consult with us now. We want you to see the "**new things**" before that building grows bigger. We want you to come right down to see the appliances demonstrated. Come in and see the beautiful fixtures, domes, chandeliers, fuel appliances, ranges, water heaters, and hundreds of other useful articles that make a home brighter and labor lighter. Won't you sit down right now and drop us a card; or better still — call and see us. Consultations free.

The Consumers' Gas Company, of Toronto

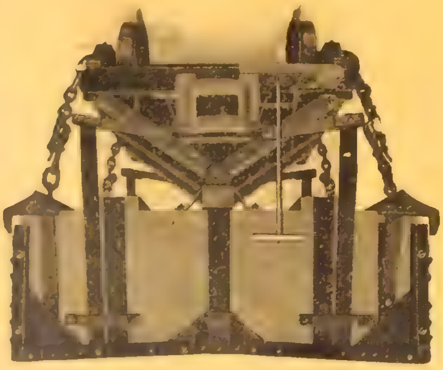
12 and 14 Adelaide St. West.
TELEPHONE: Main 1933
Head Office, 19 Toronto St.

Gas Consumers Increasing in Toronto at the Rate of 20 Per Day.

"Davenport"
LOCOMOTIVES



For Contractors' and Quarry Service
Supplied in any size and type for various gauges of track.



"Kilbourne & Jacobs"
DUMP CARS
are stronger—longer running—safer cars—cars that will do work cheaper than any other make to be obtained. Let us tell you why—
Catalogue upon request.

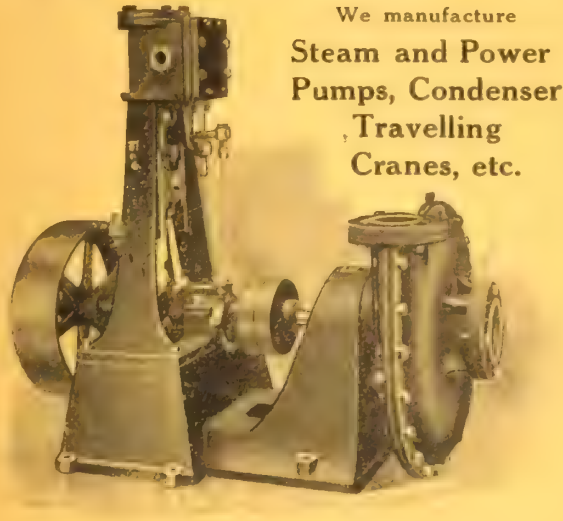
F. H. Hopkins & Co.
MONTREAL
Branch Offices: Winnipeg, Man. and Vancouver, B.C.

Vol. 25 Toronto, July 12, 1911 No. 28

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information



We manufacture
Steam and Power
Pumps, Condensers,
Travelling
Cranes, etc.

The Smart-Turner Machine Company
HAMILTON, ONTARIO Limited

"MADE IN CANADA"

Bent Glass

Made in all
Kinds of
Glass
on Short
Notice

Large Bent Plate Glass for Shop
Fronts a Specialty

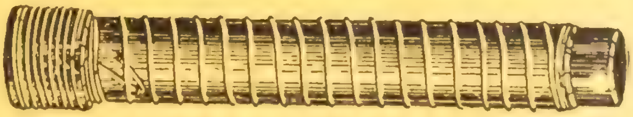
The Toronto Plate Glass Importing
Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: 91 to 133 Don Roadway
TORONTO

High Speed
Portable

COMPRESSORS

Page
28

Canadian RAND Co., Ltd.
Commercial Union Bldg., Montreal, Can.



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS
for city and town Water Systems,
Fire Protection, Power Plants,
Hydraulic Mining, Irrigation, etc.
One-half the cost of Iron Pipe—
and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

American Hoist & Derrick Co., St. Paul, Minn.
Please send information and prices on "American"
Wire Rope Block.
[illegible]

HERE'S A STANDARD "AMERICAN" WIRE ROPE BLOCK

Bigger and better than any other block made

May we send you one for comparison with any block you have ever used or seen?

Send Coupon for Information and Prices

American Hoist & Derrick Company

St. Paul, U.S.A.

Gorman, Clancey & Grindley	Edmonton and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot, Ltd.	Vancouver, B.C.
J. L. Neilson & Co.	Winnipeg, Man.
Dunn Brothers	Winnipeg, Man.
J. A. McTaggert	Winnipeg, Man.

When making specifications keep these facts in mind about Canada Cement

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

Remember

We guarantee **uniformity of strength, setting qualities, color,** and **fineness of grinding,** which must obtain if Concrete construction is to prove successful.

CANADA CEMENT COMPANY LIMITED
PORTLAND
CANADA
CEMENT
MONTREAL

Canada Cement Company, Ltd.

MONTREAL - TORONTO - WINNIPEG - CALGARY

Kinnear Steel Rolling Doors and Shutters

For Office Buildings, Warehouses, Freight Sheds, Stores, etc.

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

Special

ire-Proof Doors

For Factories, Elevator Shafts, etc.

Send for Descriptive Catalogue

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects

	Page
Keefe, [illegible]	88
Weeks, Arthur I	88

Architectural Iron Work

Canada Wire Goods Mfg Co	70
Dennis Wire & Iron Works	77
Meadows Co., Geo. B	35

Air Compressors

Escher Wyss & Co	67

Air Valves, Automatic

Marsh, J. P.	82

Asphalt Plant

East Iron Machine Co.	73

Buckets

American Hoist & Derrick Co.	2
Sackett Screen & Shute Co.	

Belting

Federal Engineering & Supplies, Ltd	80

Blowers

Sturtevant Co., B. F.	70

Boilers

Case Threshing Machine Co	79
Inglis, John	65
Jenckes Machine Co.	2
Leonard & Sons, E	73
Marsh & Henthorn	69
McDougall Caledonian Iron Works	67
Mussens Limited	4
Waterous Engine Works Co.	77

Brick Machinery and Supplies

Berg Mfg. Co.	26
Wert C. S.	29
Whitehead, John	

Brick

American Enamelled Brick Co.	78
Don Valley Brick Works	7
Hamilton Pressed Brick Co	17
Milton Pressed Brick Co	
Port Credit Pressed Brick Co.	86
Toronto Pressed Brick Co.	

Brickmaker's Supplies

Sackett Screen & Shute Co.	

Bridges (Steel)

Attica Bridge Co.	78
Canadian Bridge Co	84
Cleveland Bridge Co.	84
Dickson Bridge Works	
Dominion Bridge Co	84
Hunter Bridge and Boiler Works	30
Phoenix Bridge and Iron Works	85
Pennsylvania Steel Co.	84

Cement

Alsen Portland Cement Co	74
Britnell & Co	80
Bremner, Alex	87
Canada Cement Co	3
McNally & Co., W.	85
Morrison & Co., T.A.	88
Rogers, Alfred Limited	9

Concrete Pipe

Dominion Concrete Co.	22
Lock Joint Pipe Co.	

Cement Waterproofing

Ceresit Waterproofing Co.	33
Hercules Waterproofing Cement Co	78
Mansbendel, F. P	31

Cranes, Travelling & Locomotive

	Page
American Hoist & Derrick Co.	2
Armstrong, H. J.	71
Brown Hoisting Machinery Co.	77
Males Co	62
Willis Shaw Machinery Co	62

Conduits

Conduits Co., Limited.	87

Crushed Stone and Granite

Sand and Supplies	85

Concrete Mixers and Machinery

Canada Foundry Co	20
Cropp Concrete Machinery Co.	80
General Machinery Co.	68
Gould, Shapley & Muir	16
Hopkins & Co., F., H.	92
Ideal Concrete Machinery Co.	69
Jenckes Machine Co	2
London Concrete Machinery Co.	35
Milwaukee Mixer Co.	16
Mussens Limited	4
Morrison & Co., T. A	88
Steel and Radiation (Cement Gun)	76
Standard Scale	
Vining Bros.	
Wettlaufer Bros.	10
Wert C. S.	29

Contractors' Plant

American Hoist & Derrick Co.	2
Acme Eqpt. & Engineering Co.	75
Beatty & Sons, M.	6
Hepburn, John T	12
H. & E. Lifting Jack Co	71
Hopkins & Co., F.H	92
International Marine Signal Co.	8
Willis Shaw Machinery Co.	62
Meaford Wheelbarrow Co.	27
Marsh & Henthorn	69
Montreal Locomotive Works	32
Mussens Limited	4
Ritchie Contractors Supply Co.	72
Tiffin Wagon Co.	
Troy Wagon Works	79
Watson Wagon Co	72
Wert C. S.	29

Crushers (Stone and Rock)

Berg Machinery Co	26
Case Threshing Machine Co.	79
Hopkins & Co., F. H.	92
Jenckes Machine Co	2
London Concrete Machinery Co.	33
Males Co	62
Mussens Limited	4
Morrison & Co., T. A	88
Willis Shaw Machinery Co	62

Corrugated Iron

Galt Art Metal Co	68
Metallic Roofing Co	69
Metal Shingle and Siding Co.	27
Ormsby, A. B., Limited	11
Roofers Supply Co	87

Contractors

Bennett, Robt.	70
Foundation Co	89
Holmes, Fred.	70
McIlwraith, Jas. A.	88
Nadel & Adler	88
Wells & Gray	34

Coal Handling Apparatus

American Hoist & Derrick Co.	2
Down Draft Furnace Co.	75

Derricks and Derrick Fittings

American Hoist & Derrick Co.	2

Drills

Beatty & Sons M	6
Canadian Rand Co	28

Drilling Contractors

	Page
Harvey, J.	83

Dredges

Beatty & Sons, M	6
Males Co	62
Willis Shaw Machinery Co	62

Dry Kilns

Sturtevant Co., B. F.	70

Electrical Apparatus, Motors

Canada Ford Co.	

Engines

Case Threshing Machine Co.	79
Canadian Boving Co.	
Inglis, John	65
Jenckes Machine Co	2
Leonard & Sons, E	73
Mussens Limited	4
Sturtevant Co., B. F.	70
Waterous Engine Works Co.	77

Engineers (Civil) and Mechanical

Barber & Young	88
Chipman & Power	88
Bowman & Connor	88
Farmer, John T.	88
Fuce, Edw. O.	88
Galt Engineering Co., John	88
Glaubitz, H. J.	88
Hancock, H. Syd.	88
Inglis, John	65
Kennedy, Jas. C.	88
Lea & Ferguson	88
Mace, T. Harry	88
Mitchell, C. H.	88
McRae, John B	88
Moore & Scollan	88
Taylor, James	88

Exhaust Heads

Sturtevant Co., B. F.	70

Filters

American Water Softener Co.	

Floor Scrapers

Hurley Machine Co	30

Friction Clutches

Berg Machinery Co	26

Field Instruments

Gurley, W. & L. E.	68

Fire Brick

Gibb, Alexander	81

Fire Apparatus

Morrison & Co T. A.	88
Seagrave, W E.	80

Fireproof Doors and Windows

Douglas Bros	18
Mussens Limited	4
Ormsby, A. B.	11
Steel and Radiation	80

Gauges, Steam, etc.

Marsh, Jas. P	82

Granite and Marble

Laurentian Granite Co	83
Missisquoi Marble Co	81
Smith Marble & Construction Co.	

Glass

	Page
Consolidated Plate Glass Co.	
Luxfer Prism Co	
Toronto Plate Glass Importing Co.	1

Heating Apparatus

Jenckes Machine Co.	2
Leonard & Sons, E.	73
Steel and Radiation	76

Hoisting Machinery

American Hoist & Derrick Co.	2
Beatty & Sons, M	6
Canada Ford Co.	
Inglis, John	65
Jenckes Machine Co	2
Hopkins & Co., F. H	92
London Gas Power Co	73
Marsh & Henthorn	69
Mussens Limited	4
Parker, S. E.	80
Sturtevant Co., B F.	70

High Pressure Pipe Lines

Escher Wyss & Co	67

Hydrants

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co.	86
Kerr Engine Co	

Interior Finish and Doors

Anglin, S.	74
Brennen & Sons, M	
Batts Limited	
Canada Office & School Furniture Co	
DeLaplante, Ltd.	81
Bryan Mfg. Co.	67
Eaton & Sons, J. R.	8
Georgian Bay Shook Mills	34
Rhodes Curry & Co.	
Tillson Co.	19
Wilson Bros.	

Locomotives

Montreal Locomotive Works	32

Lime

Christie, Henderson & Co.	82
Jamieson Lime Co	70
Standard White Lime Co	75

Metal Lath

Galt Art Metal	68
Metallic Roofing Co	69
Noble C. W.	74
Steel and Radiation	78

Meters

Hopkins & Co., F. H.	92
McDougall Caledonian Iron Works	67
Neptune Meter Co	71

Paving and Paving Materials

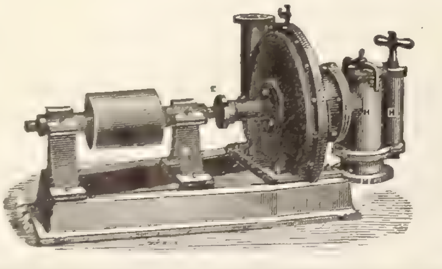
Dominion Carbolineum Works	17
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	74
Shawmut Paving Brick Co.	7
Silica Barytic Stone Co. of Ontario	83

(Continued on page 10)

M. Beatty & Sons, Limited

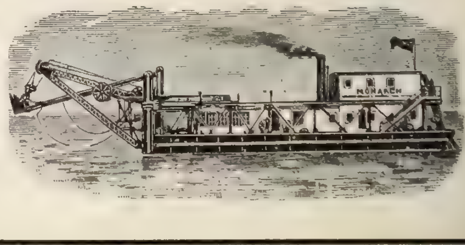
Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels



Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

SIMPLE PERFECT

CLEAN WATER

For MANUFACTURERS or MUNICIPALITIES

Can be obtained by using the

"TORRENT" or "PULSOMETER"

FILTER

Complete information furnished on request

International Marine Signal Company Limited
OTTAWA, CANADA

GRAVITY PRESSURE

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS

Limited

28 King Street West, TORONTO, CAN.

Plaster Page

Albert Mfg. Co. ... 30
Britnell & Co ... 82
Calkins H W ... 80

Portable Saw

Canadian Fairbanks ... 27

Pipe

American Spiral Pipe Works ... 75
Canadian Pipe Co ... 80
Dominion Wood Pipe Co ... 12
Dominion Concrete Co ... 22
Gartshore Thomson Pipe Co. ... 86
Lock Joint Pipe Co ...
Munderloh & Co ... 11
National Iron Works ... 87
Pacific Coast Pipe Co. ... 1
Pedlar People ...
Steel and Radiation ... 78

Plumbers' Supplies

Standard Ideal Co. ... 36

Power Engines

Inglis Co., John ... 65

Paints and Varnishes

Paterson Mfg. Co ... 90

Pile Driving Machinery

American Hoist & Derrick Co ... 2
Lincoln Construction Co. ... 80

Pumps and Pumping Machinery

American Well Works ...
Beatty & Sons, M ... 6
Cook, A. D ...
Escher Wyss & Co ... 67
Hopkins & Co., F. H. ... 92
Inglis Co, John ... 65
Leonard & Sons, E ... 73
McDougall Caledonian Iron Works .. 67
Mussens Limited ... 4
Ontario Wind Engine & Pump Co. 80
Smart-Turner Machine Co. ... 1
Waterous Engine Works Co ... 77

Roofing Materials Page

Asbestos Mfg. Co. ... 24
Galt Art Metal Co. ... 70
Metallic Roofing Co ... 69
Metal Shingle & Siding Co. ... 27
Noble, Clarence W ... 74
Paterson Mfg. Co ... 90
Philip Carey Co ... 73
Roofers Supply Co ... 87
Standard Paint Co. ... 34

Railway Supplies

Gartshore, John J ... 88
Hopkins & Co., F. H ... 92
Mussens Limited ... 4

Reinforcements. Concrete and Steel

Ambursen Hydraulic Construct'n Co. 89
Canada Wire Goods Mfg. Co ... 70
Concrete Form Engine Co ... 35
Steel Co. of Canada ... 19
Steel & Radiation ... 78
Trussed Concrete Steel Co ... 30
Turner, C. A. P ...

Road Machinery

Case Threshing Machine Co 79
Hamilton Machinery Co. ... 15
Morrison & Co., T. A ... 88
Mussens Limited. ... 4
Western Wheeled Scraper Co ... 11

Shovels (Steam)

Beatty & Sons, M ... 6
Canada Foundry Co ... 20
Hopkins & Co., F. H ... 92
Mussens Limited 4
Males Co ... 62
Willis Shaw Machinery Co ... 62

Stone

Anderson, Geo ... 18
Britnell & Co ... 82
Brodie, Jas ...
Christie, Henderson & Co. ... 82
Consolidated Stone Co ...
Contractors' Supply Co ... 82
Corinthian Stone Co ... 23
Crushed Stone, Limited ... 73
Doolittle & Wilcox ... 87
Hagersville Contracting Co 11
Laurentian Granite Co ... 83
McMillan & Son, R ... 71
Morrison & Co., T. A ... 88

Stone Page

Myers, Oakley ... 73
Roman Stone Co ... 13
Sackville Freestone Co. ... 8
Sand & Supplies ... 85
Thames Quarry Co ... 80

Sand and Gravel

Rogers Supply Co ... 31
Sand & Supplies ... 85

Steam Apparatus

Sturtevant Co., B. F ... 70

Submarine Diver

Rouleau, Joseph N. ... 88

Structural Iron and Steel

Dominion Bridge Co ... 84
Steel Co. of Canada ... 19
Pennsylvania Steel Co ... 84
Phoenix Bridge & Iron Works ... 85
Reid & Brown ... 89
Salter, W. H ... 85
Steel & Radiation ... 76

Sewer Pipe

Britnell & Co ... 82
Canada Iron Corporation ... 86
Dominion Sewer Pipe Co ... 21
Gartshore Thomson Pipe Co 86
Hamilton & Toronto Sewer Pipe Co. 20
Lock Joint Pipe Co. ...
National Iron Works ... 87
Ontario Sewer Pipe Co ... 21
Standard Drain Pipe Co ... 21

Stationary and Power Engines

Case Threshing Machine Co ... 79

Slate

Roofers Supply Co ... 87

Steel Shingles and Ceilings

Galt Art Metal Co ... 70

Smoke Stacks

Leonard & Son, E ... 73

Tents

Woods Limited ... 25

Safes and Vaults

Taylor J & J ...

Page

Testing and Inspection Bureau

Hunt & Co., Robt. W ... 73

Tiles

Smith Marble & Construction Co.,

Tanks and Stand Pipes

Berg Machinery Co ... 26
Inglis, John ... 65
Jenckes Machine Co ... 2
Leonard & Sons, E ... 73
Marsh & Henthorn ... 69
McDougall Caledonian Iron Works .. 67
Ontario Wind Engine & Pump Co. 80

Trade Journals

Castellanos A. W ... 80

Valves

Canada Iron Corporation ... 87
Gartshore-Thomson Pipe Co 86
Kerr Engine Co ...
Marsh & Co, Jas ... 82
Standard Fitting & Valve Co ... 82

Ventilating and Heating Apparatus

Gardiner & Gaskill ... 77
Sturtevant Co., B. F ... 70

Water Softeners and Filters

Berg Machinery Co ... 26
American Water Softener ...

Wire Rope

Greening Wire Co., B .. ...
Smith, Thos. & Wm ... 14
Steel Co. of Canada ... 19

Wire Guards and Screens

Canada Wire Goods Mfg. Co. ... 72
Crescent Wire Iron Works ... 83
Greening Wire Co B ...
Sackett Screen & Shute Co ...
Steel and Radiation ... 78

Water Wheels

McDougall Caledonian Iron Works. 67
Canadian Boving Co ...

Water Turbines

Escher Wyss & Co ... 67

Wheelbarrows

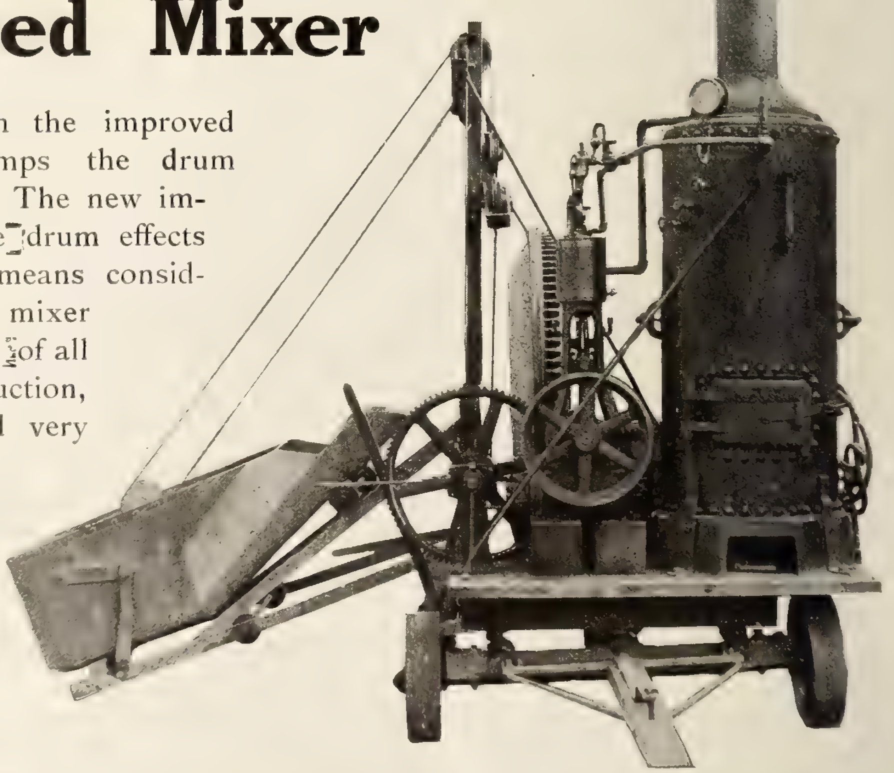
Sackett Screen & Shute Co ...

Improved Half-Yard Heart-Shaped Mixer

This Mixer is equipped with the improved dumping device which dumps the drum automatically or as required. The new improvement for discharging the drum effects a saving of one man, which means considerable on a contract. This mixer is especially built for roadwork of all kinds, sidewalk and construction, being substantially built and very compact.

Send for our Catalogue

Wettlaufer Bros.
178 Spadina Ave., TORONTO
A. R. Williams Machinery Company,
15 Dock St., St. John, N. B.
W. E. Ransome, Moose Jaw, Sask.



MODERN.

STRONGER.

CHEAPER.

→ ESTABLISHED 1861. ←

MUNDERLOH & CO. LTD.

Sole Agents in Canada for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS

AN IMPROVEMENT ON CAST IRON MAINS.

MADE UP TO 40 FEET IN LENGTH.

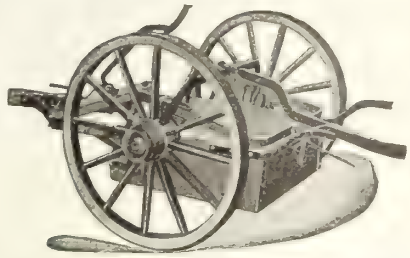
51 VICTORIA SQUARE,

MONTREAL.

RELIABLE

Scrapers and Grading Plows

Backed by a Reputation



Ask any contractor of large experience He will tell you that for over a quarter of a century there has been maintained a reputation for largest capacity and greatest durability for the

"Western" Line of Wheeled and Drag Scrapers and Grading Plows

The reason is a life-time's experience in actual contract work **combined with** an extensive manufacturing experience and every machine has been perfected after years of the most rigid tests,

Western Wheeled Scrapers, the pioneers and most extensively used characterized by square-shaped pans bent cold, general sturdy construction and many patented exclusive features. Built in any size.

Western Drag Scrapers, Chicago Tongue and Western Buck Scrapers.

Western Railroad and **Township Plows,** designed for hardest service and proved by many years of use. Any size from 2 to 16 horse power.

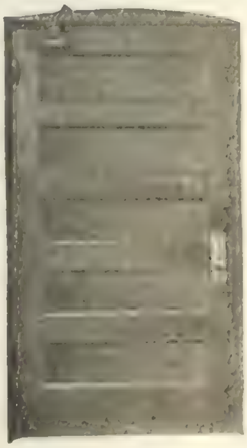
Get our complete catalogue of earth and stone handling machinery.

Western Wheeled Scraper Co.

AURORA, ILL.

IN

Montreal, Toronto, Winnipeg, Vancouver



and many other Canadian cities, our **Kalameined Clad Doors** are to be found in the leading office buildings. Architects in all parts of the Dominion are specifying them, they add to the appearance of their building, they give real fire protection. No matter what your detail is, we can execute it correctly and give you doors that are as fine looking as any wooden doors. Our Doors do not bulge between the wood and the iron.

A. B. Ormsby, Limited

Experts in Fireproof Windows and Doors

Factories: - - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries: **HAGERSVILLE, ONT.**

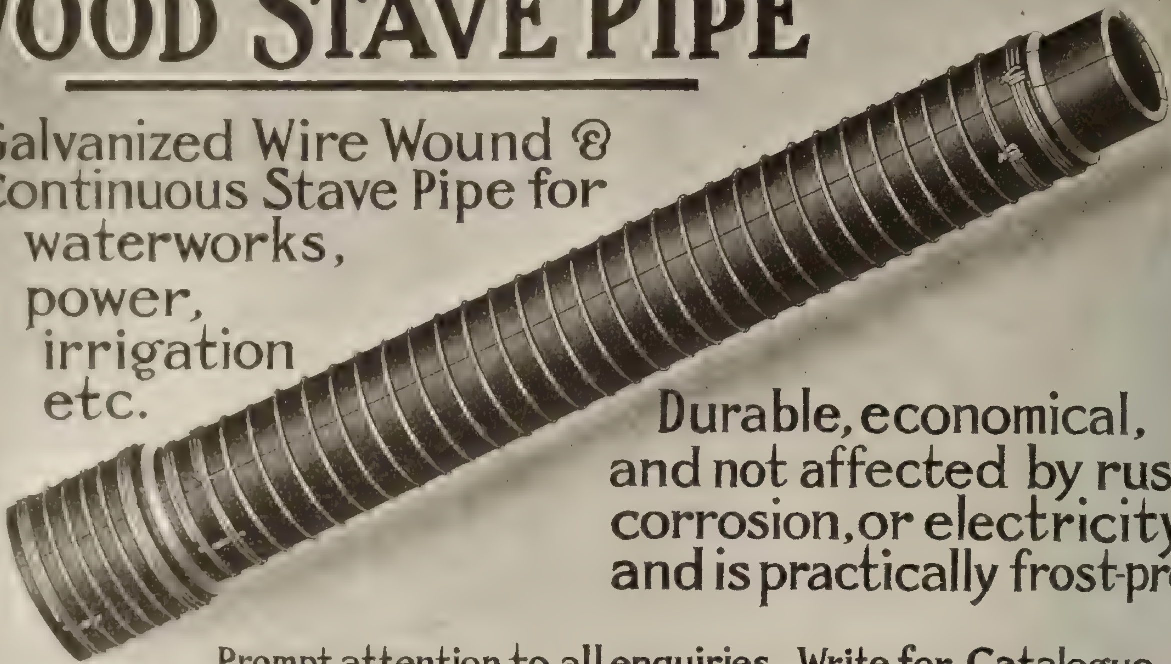
SALES AGENTS FOR TORONTO:
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.

Limited

Hagersville - Ont.



WOOD STAVE PIPE

Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.

Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Have you any use for a Derrick?

There are large plans under way. Large contracts are being placed. In all directions there is bustle and activity. Everything points to an unusually busy season for construction work of all kinds. But what about equipment?

John T. Hepburn

Scotch Derricks

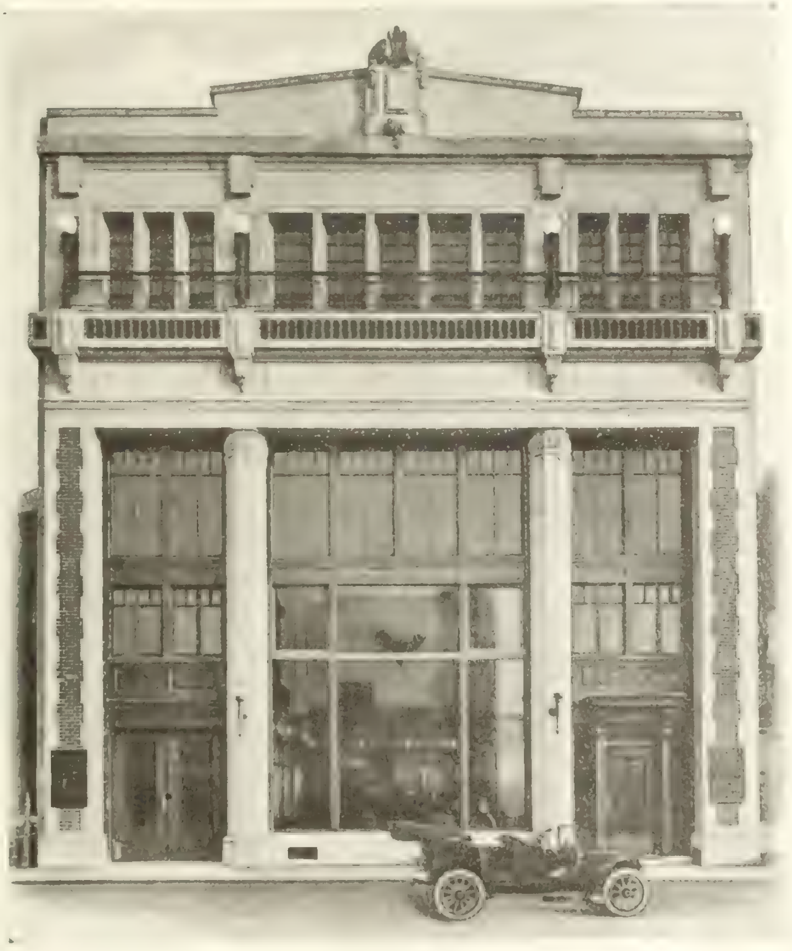
are in use by all leading contractors in all parts of the country. They are designed and built for hard work, combining safety and high efficiency, with low operating cost. Being made in standard sizes, any part can be replaced at short notice. They may be operated by hand or power—are fitted with single and double purchase gears—powerful band brake—and safety locking device that prevents boom from falling.

We are busy now. We shall be busier in two or three weeks
Better place your order to-day to secure early delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

Roman Stone

(Trade Mark Registered)



Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company

Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

THOS. & WM. SMITH, LD.,

WIRE ROPE MANUFACTURERS,

NEWCASTLE-ON-TYNE, ENGLAND.

ELECTRIC CABLEWAY OVER THE ZAMBESI RIVER AT THE VICTORIA FALLS.
Span, 870 feet. Working Load, 10 tons. Main Cable 8⅛'' circ. Breaking Stress of Main Cable, 275 tons.
Main Cable supplied by THOS. & WM. SMITH LTD., Newcastle-on-Tyne.

HIGH-CLASS WIRE ROPES

For CONTRACTORS' WORK, such as BLONDINS, CRANES, INCLINES, BALLAST ROPES, &c., &c., and all classes of work requiring Wire Ropes.

AGENTS IN CANADA:

EVANS, COLEMAN & EVANS, Ltd., Vancouver.
ANGEL ENGINEERING & SUPPLY CO. Ltd., St. John's, N.F.
DOMINION EQUIPMENT & SUPPLY CO., Winnipeg.
BAINES & PECKOVER, Toronto.

REPRESENTATIVE FOR CANADA:

D. W. CLARK, P.O. Box 521 TORONTO, ONTARIO.

USE ONLY SMITH'S "RED THREAD" WIRE ROPES.

'Champion' Road Machinery

Leads all Others

Good design will never compensate for structural weakness.

Structural strength will never make a poorly designed machine good.

It is only when Road Machinery is **right in every respect** that it can be trusted to do all that is expected of it under all conditions.

"Champion" Road Machinery leads all others because it has no weaknesses to offset its invaluable, exclusive features.

"CHAMPION" Rock Crushers

"CHAMPION" Graders

"CHAMPION" Sprinklers and Sweepers, etc.

have born the champion reputation for over 20 years. Write for the catalog before you buy—tell us which machine interests you and we will give full information.

Save 3 to 5 days on Repair Parts

Order all repair parts direct of the Hamilton Machinery Co., 144 York St., Hamilton. By sending direct you will save from 3 to 5 days in shipment of your order.

Manufactured by

American Road Machine Co., of Canada, Limited

GODERICH, ONT.

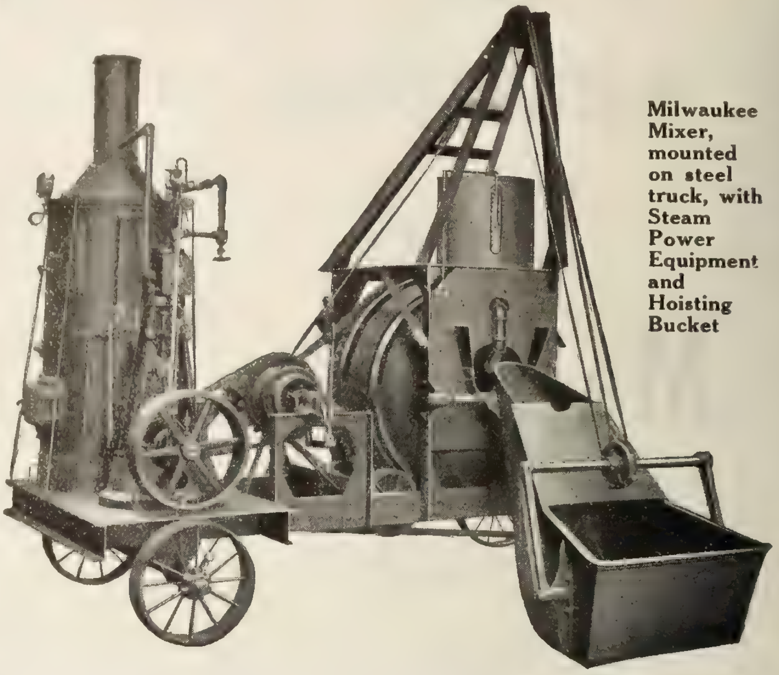
THE HAMILTON MACHINERY CO., LIMITED, HAMILTON, ONT.

Sole Agents for the Above Company

Also Canadian Distributors for the famous Inter State Automobile.

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES.

The Stuart Machinery Co., Winnipeg, Man. C. W. Stancliffe & Co., Vancouver, B. C.

H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS

Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

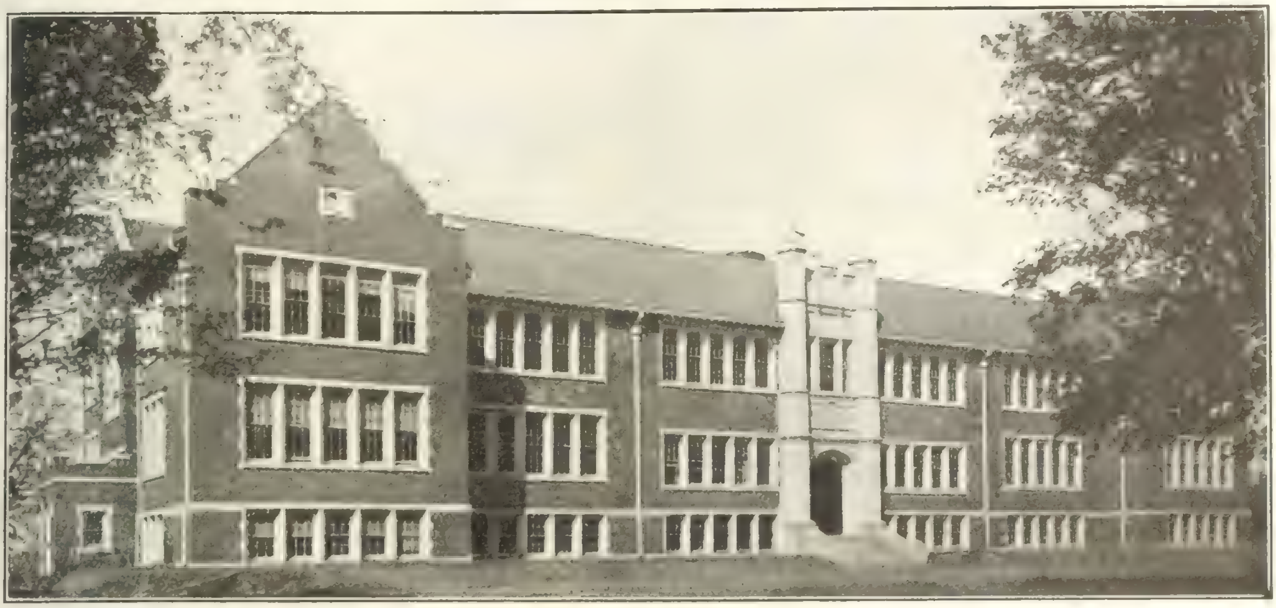
Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada

Hamilton Pressed Brick



New Collegiate Institute, Brantford, Ont. Chapman & McGiffen, Architects, Toronto

For Clean Brick-Work

This brick is free from so-called soda. After twenty years it will look as clean and fresh as the day it is delivered. Hamilton Pressed Bricks are uniform in size and color. The illustration shows a neat, clean cut job obtained with our brick. Specify **more** than "Brick" make it **"Hamilton Pressed Brick."**

Besides furnishing a high class product we can fill your orders promptly. Connections with T. H. & B, C. P. R., G. T. R., M. C. R

Hamilton Pressed Brick Company
Limited

Phones
Factory 1992
Office 2931
Residence 345

Spectator Building, Hamilton, Ont.

Toronto Representative, WALTER HUNTER 105 MacDONALD AVE.
Montreal, STINSON-REEB CO., Eastern Townships Bank Building.

Circular Diamond Saws

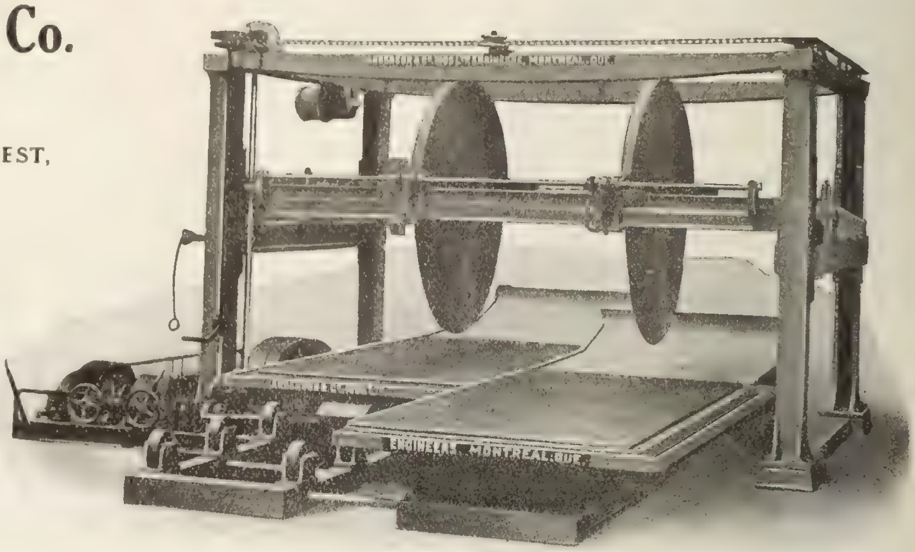
For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICES & WORKS
London, England, 82 Victoria St., S.W.
Newark, N.J., U.S.A. 420-422 Ogden St.
Montreal Works, 157 Craig St. West
Head Works, Carnoustie, Scotland

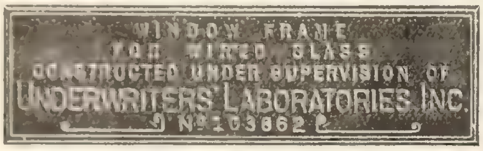
MAKERS OF

**Gangs, Planers, Marble Dressers, Derricks, and Electric Traveling Cranes up to 50 tons, Quarry Machinery, Gas Engines and Producer Plants.
10 H. P. to 150 H. P.**



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 SINGLE AND DOUBLE TABLES

About 50 of the above Machines at work in Canada


WINDOW FRAME
FOR WIRED GLASS
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES, INC.
№ 103862

Underwriters' Label.

The Underwriter's Test

There is absolutely no question as to the comparative value of our Metal Fireproof Windows over the old-fashioned metal or metal-covered wood shutters. Repeated tests have proved conclusively the superiority of metal fireproof windows.

The ideal fireproof windows should be constructed to meet the following requirements:

It must be absolutely fireproof.

It must have hollow sheet metal frames and sash, fitted with wire glass.

It must be riveted and locked together so that it will not fall apart when exposed to intense heat, solder only being used to finish the seams and mitres.

The Douglas Window has stood the National Board of Fire Underwriters' test to which it has been subjected at their Laboratory at Chicago, and is endorsed by them.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

The

Tillson Company

Limited

WHOLESALE MANUFACTURERS OF

Sash, Doors, Mouldings, Frames for Doors and Windows, Columns, Interior Finish of Every Description, Porch Work, Gable Ornaments, Brackets, Head Blocks, Corner Blocks, Base Blocks, Door and Window Screens, Etc.

Millwork of all kinds

Tillsonburg,

Ontario

The Steel Company of Canada Limited

Hamilton - Toronto - Montreal

PLAIN ROUNDS, & SQUARES, COLD TWISTED SQUARES

MAXWELL DEFORMED BAR

STEEL BARS

for Reinforcing Concrete

J. H. NEW, President RYLAND H. NEW, Vice-Pres.

Hamilton Vitrified Salt Glazed Sewer Pipe

Known as the best for 50 years
The Quick Shippers

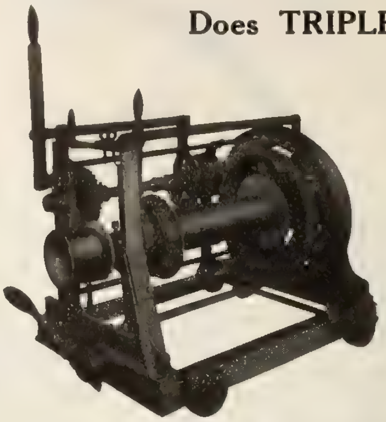
The HAMILTON & TORONTO SEWER PIPE CO., LIMITED

HAMILTON and TORONTO

LONG DISTANCE PHONES: Toronto, Main 990, College, 1558
Hamilton, 3990, 3991, 3132

The Parker Reversible Friction Hoist

Does TRIPLE Duty



Run with Gasoline Engine or Motor

No Experienced Operator Required

Drum. Elevator Sheave, Winch-head all operate independently of each other, and are each reversible. This hoist operates a derrick from the drum, a double cage material elevator from the sheave, and serves various other purposes from the winch-head—all on one job.

PAYS FOR ITSELF ON ONE ORDINARY JOB.

"I have used your No. 100 Reversible Hoist for over 5 years. It runs like a clock and has cost me nothing for repairs."

From an Experienced Contractor.

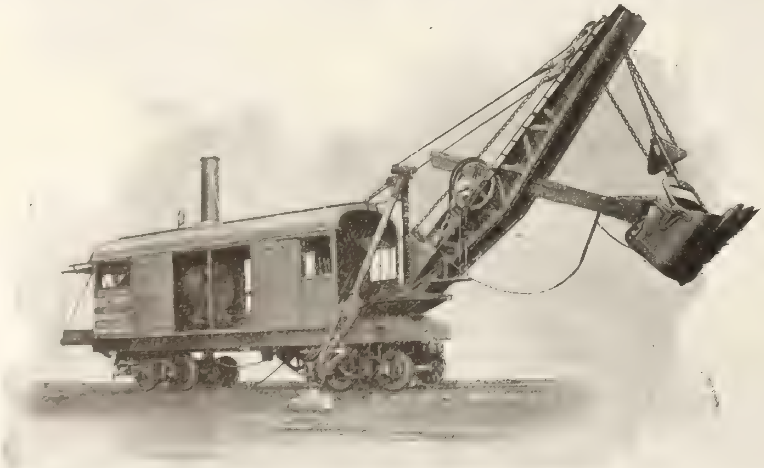
We also build derricks, steam and electric hoists in all sizes. Sole manufacturers of the PARKER PATENTED DERRICKS.

Write for information and prices.

S. E. PARKER, 1800-2 N. Francisco Ave., Chicago, Ill.

Selling Agents:
Gorman. Clancey & Grindley, Calgary and Edmonton, Alta.
J. L. Stuart Machinery Co., Winnipeg, Man.
A. G. Langley & Co., Vancouver, B.C.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert Pipes

We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES

True to Size.
Impervious to Water.
Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

The Pipe of the Hour — Mimico Brand

MIMICO PIPE IS RIGHT

ROUND PIPE and SQUARE DEALINGS

It is not Gas Pipe nor Steam Pipe, it is
SEWER PIPE

MEN who know have
Intimated to us
Many times that
It pays to buy "Mimico." The
Cost is little or no more than
Other makes.

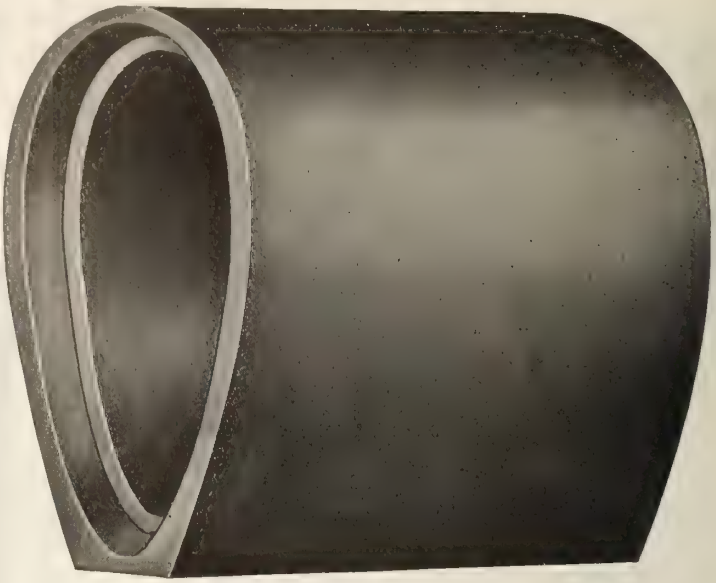
Perhaps you are
Interested in
Proposed contracts. Ask the
Engineers about it.

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422; Evenings, Park 3888 and 3889

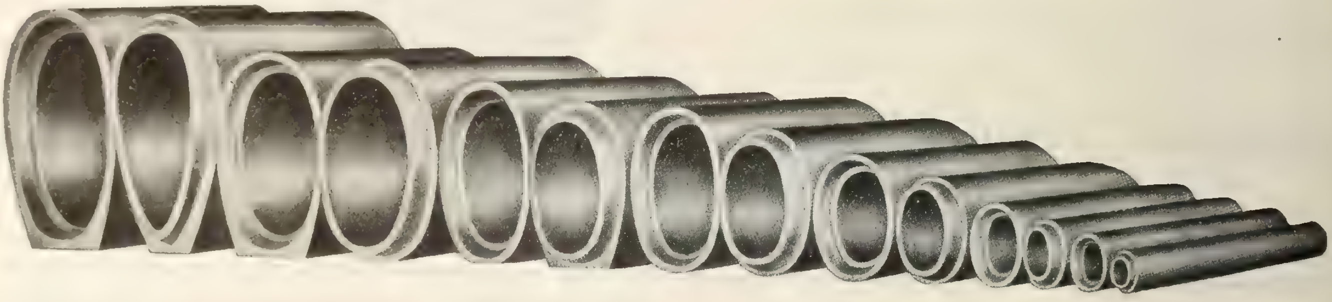
Municipal Engineers and Contractors

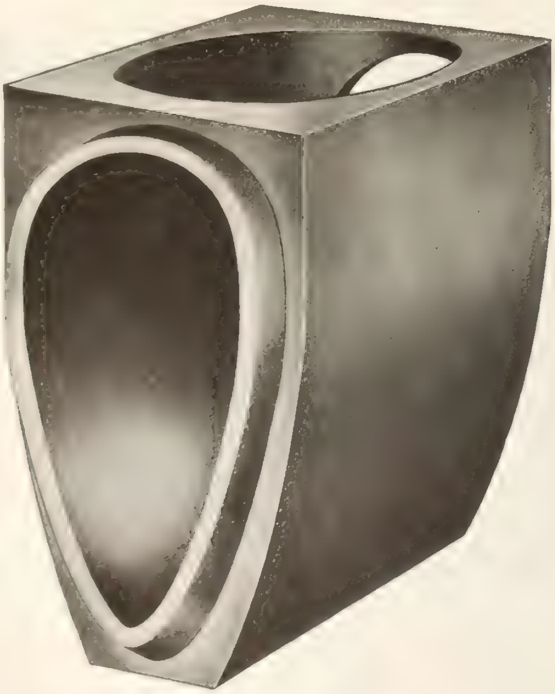
For **sewers** the only everlasting pipe is **concrete.** Builders do not use brick in foundations. Why? Because of the moisture. They do use concrete. Why? Because it is a proof against the destructive tendency of moisture. Why continue to use brick for sewers when a better material is now available at as low a cost?

In **Duluth** brick sewers failed after seven years so as to require replacement. **Concrete** sewers put in at the same time are **intact.** In **Millwaukee** after 25 years concrete pipe was found better than when new. Of 300 miles of sewers in **Millwaukee** over 200 miles are of **concrete.**



Section of 2' x 3' pipe





Man-hole Section of 2' x 3 pipe

Concrete sewers abound in **England** and **Germany**. The modern **sewers** of **Paris** are all of **concrete**. American cities have adopted it. **Brooklyn** has hundreds of miles of it with not a single failure, whereas even Scotch vitrified pipe has been found to have deplorably failed there. **Toronto,** after much hesitation, is now in line with concrete. Why be the last to join the ranks you eventually will and must join?

Our circular and egg-shaped sewer pipe are unsurpassed in quality, are more easily laid than flanged pipe, and give no trouble or ridiculous expense over man-holes or connections.

We have replaced vitrified pipe with concrete pipe and have found over 50 per cent of the vitrified unfit for re-laying. We carry a large and mature stock, we guarantee the quality, we take care of breakage in transit, and we solicit your patronage.

WRITE FOR CATALOGUE PRICE

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO

Corinthian Stone

is extensively used for Church Building, in trimmings for brick or stone work, it is without an equal. Special prices for any work where a large quantity of repetition occurs :: :: ::

Ingersoll Methodist Church—Architects, Messrs. Taylor & Taylor, Brantford.

A large quantity of Corinthian Stone was used in the remodelling of this church. Estimates given for all classes of work. Send plans or write to :: :: :: : ::

The Corinthian Stone Co.

OFFICE AND WORKS:
G. T. R. JUNCTION, GUELPH, ONTARIO

Stop the Continual Expense

for repairs and replacements necessary with most ordinary roofing materials and use

"Asbestos Shingles"

These shingles have been severely tested in the Chemical Laboratories, also in actual use and have never failed to "MAKE GOOD."

For a period of three months the Asbestos Cement Slate absorbs and assimilates moisture in exactly the same ratio as the best natural slate. After that time the absorption ceases altogether, and the material becomes impervious, indestructible and as hard as iron.

Specify

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P. Q.
Factory at Lachine, P. Q.

TENTS
for Engineers and Contractors

We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

Woods Limited
Woods Building - Ottawa, Ont.

The United States Steel Corporation, at Gary, Ind.;
Stone & Webster Engineering Corporation, Minneapolis, Minn.;
A. Monsted Co., Milwaukee, Wis.;
Geo. B. Swift Co., 903 Security Bldg., Chicago.;
Pacific Coast Condensed Milk Co., Seattle, Wash.;
Sheffield Farms-Slawson Decker Co. Amenia, N.Y.; and
Inland Steel Co., Indiana, Ind.,
are among the largest users of concrete in the United States. They and many others, are using

REICHERT METAL FORMS

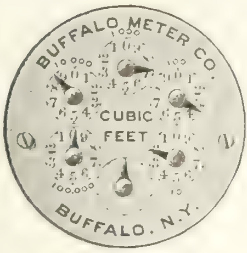
And saving from 3 to 7 cents per square foot.

Why do YOU stick to the old methods and let this additional profit slip away from you?

Building a big factory building with Reichert Metal Forms. Pacific Coast Condensed Milk Company's plant at Berlin, Wis. Stone & Webster Engineering Corporation, builders.

REICHERT MFG. CO.
MILWAUKEE, WISC., U.S.A.

AMERICAN AND NEW NIAGARA
WATER METERS



Standard Dial

Straight Reading Dial

Jewel Bearing
Intermediate Gears
Self Cleaning and Sanitary
Adjustment for Pressure
Extra Thick, Strong Disc
Accuracy Guaranteed
Fewest Parts

BUFFALO METER CO.
290 TERRACE, BUFFALO, N.Y.

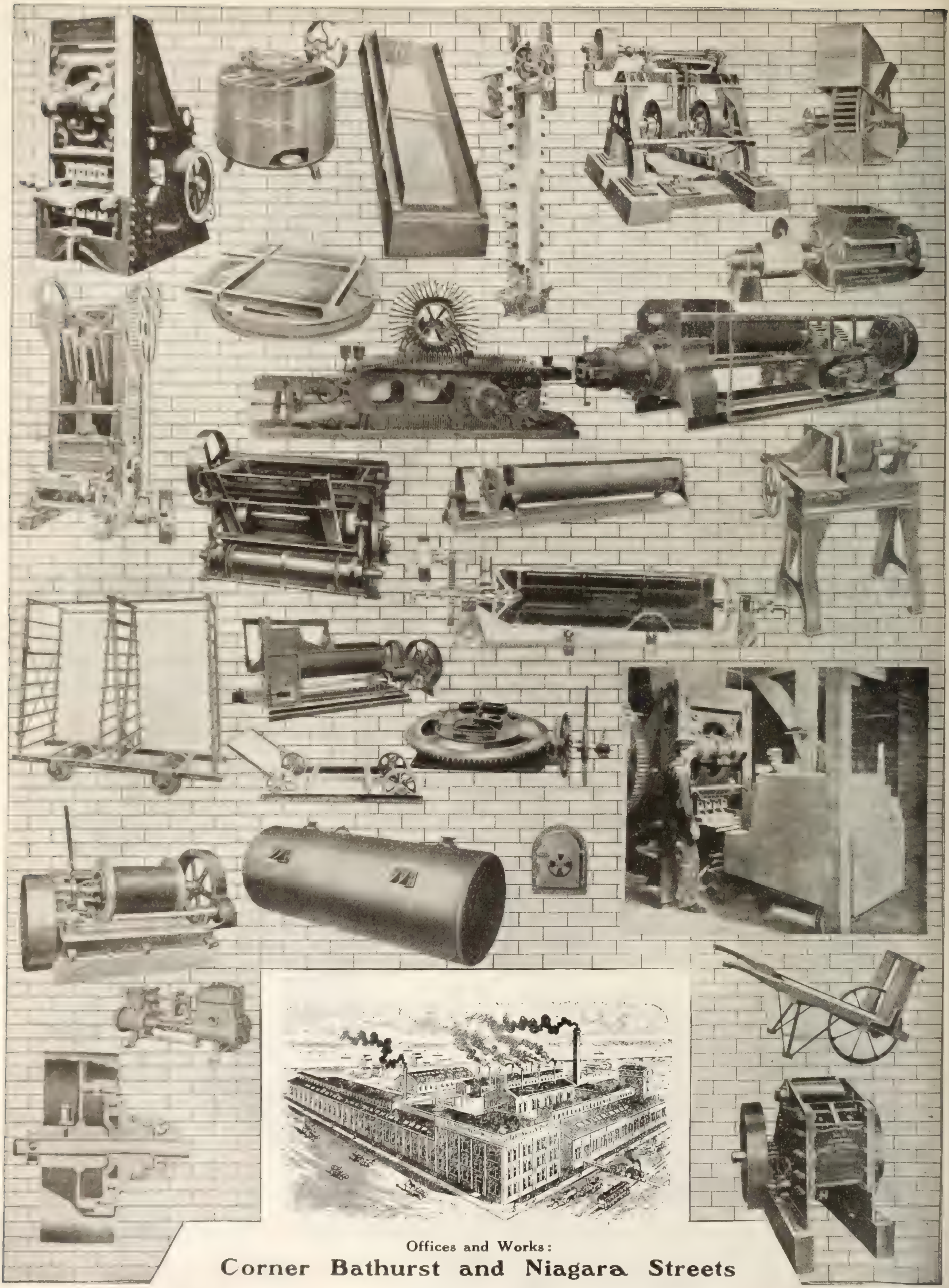
Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City

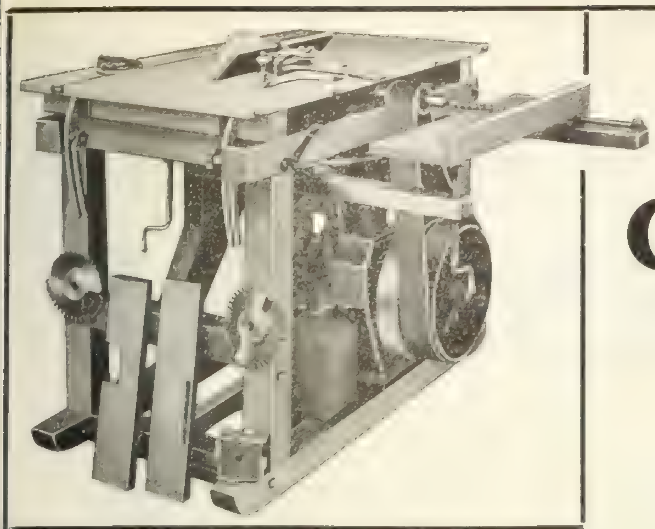


Offices and Works:

Corner Bathurst and Niagara Streets

The Berg Machinery Manufacturing Co., Limited

Toronto - Ontario



On Every Concrete Job

You can save 10 to 15 per cent by using our Contractor's Portable Saw and Variety Woodworker.

Now is the time when you are starting to do your concrete work and this saw will be just what you are looking for—a cheap practical saw that will prove itself a time saver and money maker for you.

CONTRACTORS SUPPLIES OF ALL KINDS

The Canadian Fairbanks Co., Limited

Fairbanks-Morse Gas Engines, Fairbanks Scales. Safes and Vaults.

Montreal Winnipeg Toronto Vancouver
St. John, N.B. Calgary Saskatoon Ottawa

WHAT IT IS

A Rip Saw
A Matcher
A Mitre Saw
A Cut-Off Saw
A Dado Machine
A Jointer
A Boring Machine
A Gaining Machine
A Grooving Machine
A Babbitting Machine
A Moulder with Self-Contained Power

Do You Build on 'Spec'?

Houses and stores sell better, and rent quicker, when ceiled with Preston Steel Ceilings. People don't like to live amid bare walls for the year that must usually elapse before plaster dries.

Preston Steel Ceilings are not only beautiful in themselves, but the most practical ceiling for the speculative builder. For they can be painted as soon as they are installed, and that alone helps sell or rent any property. Moreover, they are fireproof—which lessens the insurance rate : and sanitary—which no plaster ceiling ever can be. Dampness does not effect them. Yet they are economical.

Nothing equals a Preston Steel Ceiling for rented property. For, once in place, they need no repairs and will outlast the building itself. Choose from over 1,100 most modern designs. Send for handsomely illustrated book of designs, and trade price list.

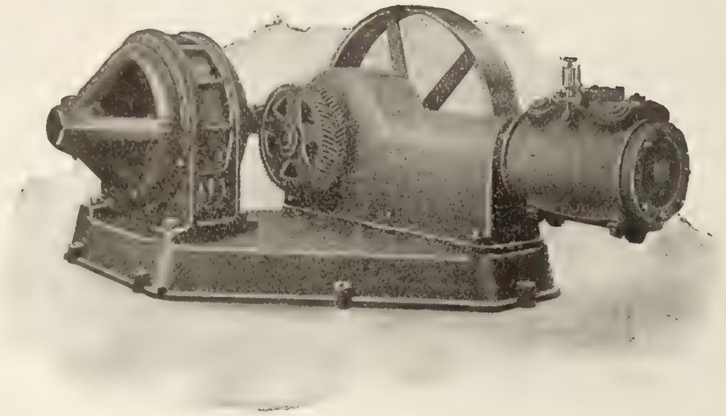
Over 1,100 DESIGNS

Ask for the book

The Metal Shingle & Siding Co.
Limited
Preston, Ontario
Branch Office and Factory - MONTREAL

Portable, Gear Driven

COMPRESSORS



Rand Class "NE—1" Straight Line Compressor mounted on a rigid sub-base and geared direct to an Electric Motor. A high speed, simple and perfectly automatic machine particularly adapted to contracting duties, where electric power is available.

The gear driven Class "**NE-1**" Compressor is a simple, reliable design in which automatic operation is combined with great power economy. This type permits of the advantage of direct electric drive at a very moderate first cost.

It is a well known fact that power economy is best effected by generation from a central plant.

Why not take advantage of this direct electric drive and economize on your power consumption, instead of generating your own power by small expensive boiler units.

Class "NE-1" Compressors are built in standard capacities of 50 to 300 feet free air per minute. Pamphlet K-92.

PNEUMATIC TOOLS **ROCK DRILLS**

CANADIAN RAND CO., LIMITED

Commercial Union Building, MONTREAL, CAN.
Toronto, Cobalt, Winnipeg, Lethbridge, Rossland, Vancouver, Halifax
South Porcupine Spokane Sydney

MADE IN CANADA

FOR THE BETTER CONVENIENCE OF THE TRADE AND TO EXPEDITE DELIVERY

THE R. I. W. DAMP RESISTING PAINT CO.

HAVE ESTABLISHED A FACTORY AT

1372-6 BATHURST STREET - TORONTO

WHERE THE TECHNICAL PRODUCTS AND DAMP RESISTING PAINTS OF

TOCH BROS. - NEW YORK

WILL BE MANUFACTURED WITH ALL THE CARE, SKILL AND SUPERVISION EXERCISED IN THEIR NEW YORK PLANT.

ALL ORDERS FROM ALL PARTS OF THE DOMINION WILL BE FILLED FROM THE TORONTO FACTORY

"CEMENT FILLER" and "CEMENT FLOOR PAINT"

Renders surface of floors damp-proof, allays dust, stops suction.

"R. I. W." DAMP RESISTING PAINT

For damp-proofing Brickwork, concrete and metals.

"TOCKOLITH"

To protect Steel and Iron against rust or corrosion.

"TOXEMENT"

For Damp-proofing Concrete or Cement Mortar against pressure.

"KONKERIT"

To Damp-proof Brick, Stone and other walls and to prevent salting.

CANADIAN DISTRIBUTERS:

CHILLAS-BLACK, LIMITED
TORONTO

E. F. DARTNELL
MONTREAL

DUNN BROTHERS
WINNIPEG

WM. H. O'NEIL
VANCOUVER

THE POPULAR AND SUPERIOR

PERFECT BRICK MACHINE

AND MY VARIOUS MOULDS ARE USED IN ALL PARTS OF THE WORLD

Patened in Canada

C. S. WERT

Inventor and Manufacturer of

The Perfect Brick Machine and Moulds

602 North Main St.,
Kendallville, Ind., U. S. A.

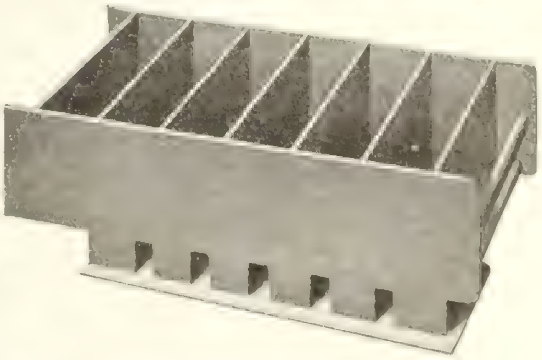
Write for Catalogue and Prices

Agents and Distributers wanted in Canada.

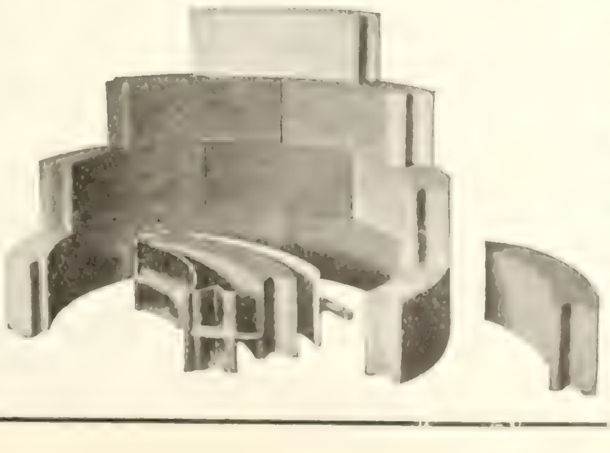
THE POPULAR AND SUPERIOR

PERFECT BRICK MOLD

IS USED IN ALL PARTS OF THE WORLD



The Perfect Well, Cistern and Silo Molds



PRICE LIST

No. [illegible] Circle Mold [illegible] feet. No. [illegible] Circle Mold [illegible] feet. No. [illegible] Circle Mold [illegible] feet. All sizes [illegible] at [illegible] retail at $15.00 each.

[illegible] its circumference.

In [illegible] always give the diameter of [illegible] and I will then understand the kind of Circle Mold you desire.

[illegible]
No. 14 " " " 14 "
[illegible]

Price $15.00 [illegible]

KAHN SYSTEM

of Construction includes

Rib Metal

Expanded from the best grade of medium open hearth steel.

Supplied in sheets up to 18 ft. in length, width 16 ft. to 5 ft. 4 in. For reinforcing concrete floors, roofs, walls, cisterns, etc.

Other Products—**Kahn Truss Bars, Rib Bars, Hy Rib, Trus-Con.** Chemical products for waterproofing and finishing concrete.

Trussed Concrete Steel Co.
of Canada, Limited
Head Offices and Works, Walkerville, Ont.

BRANCHES:
TORONTO—23 Jordan St.
WINNIPEG—Union Bank Bldg.
MONTREAL—128 Coristine Bldg.
VANCOUVER—52 Hutchinson Bldg.

"Hammer Brand"
Hard Wall Plaster

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Works Destroyed by Fire
—Now Rebuilding

COFFERDAMS
AND CONCRETE WORK

Cofferdam at Southampton; 40 feet x 12 feet, 14 feet deep.

We are experts at this work and before you close a contract, get our figures. We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

The Contractor's
"Money Saver"

Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment --- Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto—write us **to-day.**

MACHINE
PAYS FOR
ITSELF
IN A FEW
DAYS.

" Little Giant Floor Scraper "

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

Tel.
Main 4155

We are now
in the
Sand Business

• Our Wagons hold 2½ Yards
High Grade Sand and Prompt Delivery

Rogers Supply Co.
28 King St. West,
Toronto

KITON is nothing else but **TAR**

which through a Patented Process is made

Soluble in Water

This solubility however is lost, the moment KITON becomes dry for the first time, that is, after evaporation of the water with which it is mixed. From that instant on, KITON can never be re-dissolved in or washed off by water. It is **impervious** and **weatherproof.**

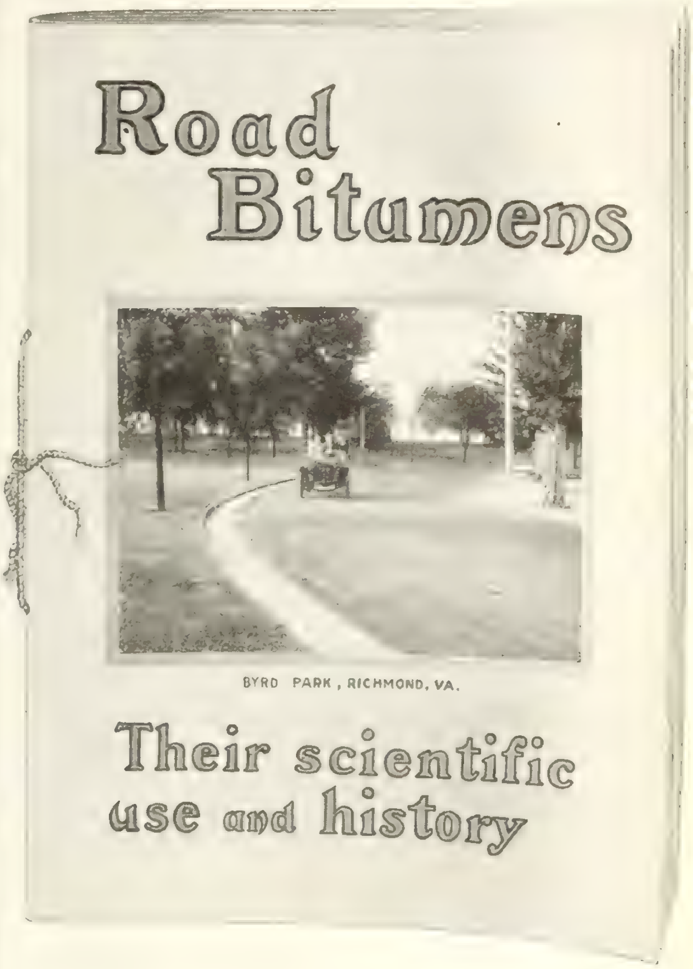
just like tar

BECAUSE it can be applied as easily as ordinary paint,
" it can be coloured if desired,
" it is so economical and yielding,
" it is instantly ready when you want it,

KITON is the cheapest and most reliable surface coating for material subjected to the deteriorating action of weather and atmosphere.

ASK FOR BOOKLET, SAMPLE AND PRICES
ATTRACTIVE PROPOSITION FOR DEALERS

F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.



Road Bitumens

BYRD PARK, RICHMOND, VA.

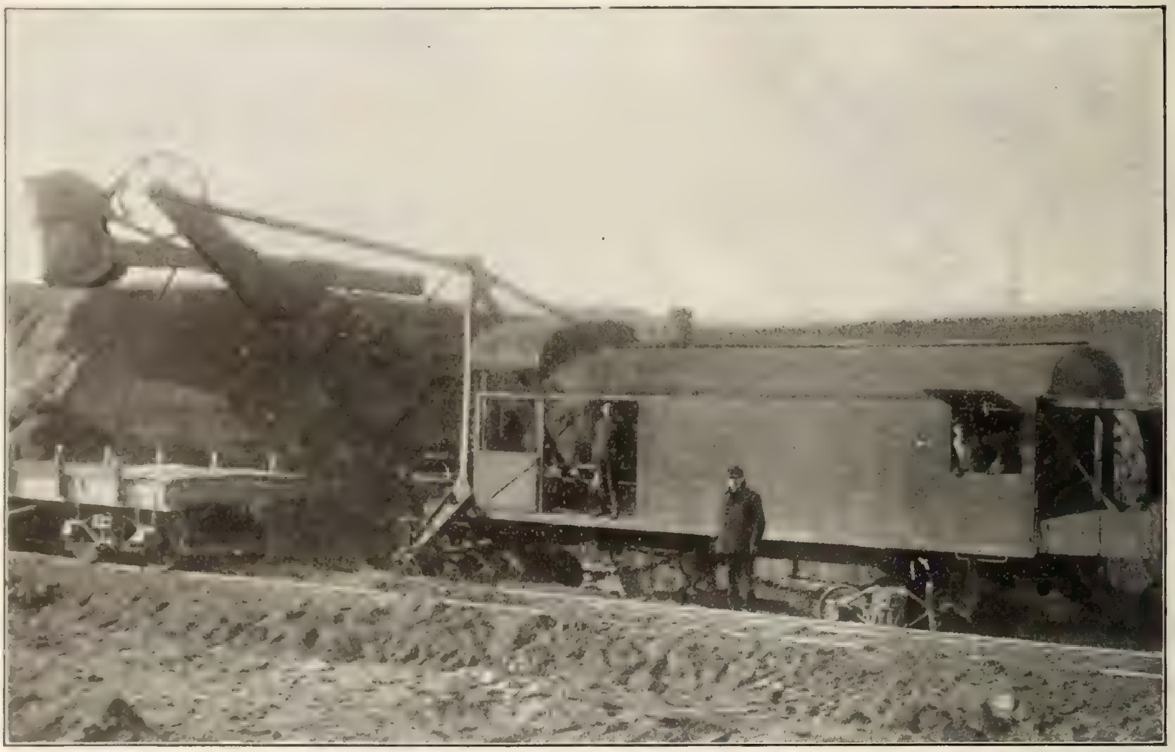
Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a pamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement
Company
First National Bank Building
CINCINNATI

ATLANTIC STEAM SHOVELS



CLASS 45-16-2½ ATLANTIC SHOVEL

ECONOMY IN OPERATION

Reduction in friction and boiler losses, with corresponding increase in pull at dipper is the reason why the Atlantic shovel digs more at less cost than shovels of the chain type.

Wire rope hoist, found only in the Atlantic, exerts a direct pull on the dipper and substitutes friction of a rope with but one large sheave for that of a chain with from four to six additional small sheaves. The less power lost in the machine itself, the more you have left for digging.

Further economy in operation is secured by using a large boiler of the locomotive type, in which more of the heat is utilized and less is lost up the stack. This is possible only because of the removal of the hoisting engines from their usual position on the car body, to the boom.

The placing of the main hoisting engines at the foot of the boom reduces the power necessary for swinging the boom and removes the twist upon the car body when working on one side. With this construction the turnable center and boom foot constitute the engine frame. One casting takes the place of four or more in the usual construction, reducing the total weight of the shovel, and the weight on the front trucks.

Spare parts are kept on hand at our works at Longue Pointe, Montreal, Canada. Every part is made to gauges, and sure to fit.

MONTREAL LOCOMOTIVE WORKS, LIMITED

41 OTTAWA BANK BUILDING, MONTREAL, CANADA

Looking for Business

Then our DAILY REPORT SERVICE will help you. Our organization provides the only systematic method yet devised for reporting Building and Engineering projects from their inception to completion.

Special facilities for gathering news of sales opportunities in machinery, equipment and materials required.

Ask us for further information. Let us send you rates and specimen reports.

We Want Men

We require a man in every important town in Canada to report the progress of the building and engineering activities of his locality. We want men to tell us when machinery, equipment, supplies and materials are required—men who can report promptly and accurately news of all sales opportunities in these trades.

We report this information daily to our subscribers. This enables them to get in direct touch with the buyer.

There are one or two places where we are not represented. Perhaps it is your town. It will be worth your while to ask us.

MacLean Daily Reports

Head Office: 220 King St. West, Toronto. **Branches: Vancouver, Winnipeg & Montreal**

A Reliable Waterproofing

For Cement and Concrete

Unlike all others for foundations, cellars, cellar floors, tunnels, dams, reservoirs, swimming pools, building walls, bridges, etc.

What is Ceresit ?

Ceresit is the name of a dependable waterproofing.

Ceresit is a cream white paste which is added to, and is generally dissolved in the water used in mixing cement mortar and concrete.

By mixing in the water the Ceresit permeates the entire mass uniformly. This is impossible with powdered waterproofing.

Ceresit for Concrete

Ceresit is incorporated in the concrete mass and thus becomes a part of it, permanently rendering the mass proof against the penetration of water even under great water pressure besides protecting it from frost.

Please write for our Book "S" on "Waterproofing" for Cement and Concrete. Ceresit is catalogued on pages 46 and 47 of Sweet's Index.

Ceresit Waterproofing Company, Chicago

General Offices Commercial Bank Bldg.

Branches: 1133 Broadway, New York 1218 Chestnut St., Philadelphia

Italian Pool in the Gardens of Doubleday, Page & Co., Publishers of "Country Life" at Garden City, Long Island, waterproofed with Ceresit.

Ceresit for Cement Mortar

Ceresit can be mixed with the water used in cement mortar coating to waterproof or dampproof structures built of any material such as brick, stone, concrete, stucco, plaster and tile.

Ceresit is Guaranteed

Ceresit is guaranteed to be an unfailing permanent waterproofing when the work is done under our direction.

PLEASE CUT OUT THIS

REMINDER

to write for BOOK "S" on

WATERPROOFING

to Ceresit Waterproofing Co., Commercial Bank Bldg., Chicago.

C. P. R. Freight Car Repair Shop, West Toronto

We completed this job in 2 months

WELLS & GRAY, Limited, Engineers and Contractors, **Toronto**

Doors, Pine and Veneered Hardwood

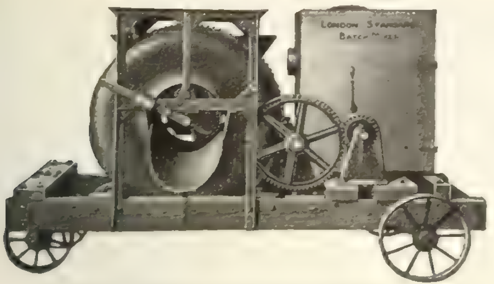
Midland Brand

Our stock of doors is most complete, all we want is your order. We are prepared to take care of any amount of business you may give us. Our doors are made to get business and to keep it.

Will You Send Us Your Next Order?

Georgian Bay Shook Mills, Limited

MIDLAND, ONTARIO



London Standard Drum Batch Mixer No. 1
Equipped with Gasoline Engine

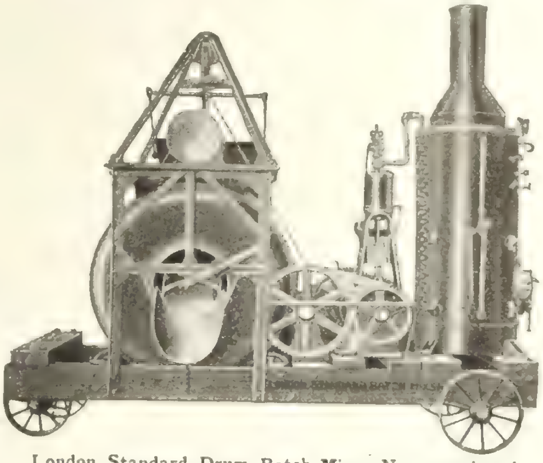
London Standard Batch Mixers

THE LONDON STANDARD DRUM BATCH MIXERS are made in four sizes, namely, one-third yard, one-half yard and one yard batches and are furnished with any equipment.

THE MANY NEW AND IMPROVED FEATURES of the London Standard Drum Batch Mixers appeal to every contractor desiring a mixer of this type. WE CAN GIVE YOU THE BEST VALUE FOR YOUR MONEY of any Firm doing business, BECAUSE we manufacture only Concrete Machinery, and on this account we can sell you a machine at very much less cost than Firms who do not manufacture their own machines but handle a concrete mixer along with other lines of goods.

We also Manufacture—
FACE-DOWN BLOCK MACHINES
CEMENT BRICK MACHINES
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES
SEWER PIPE MOLDS
ORNAMENTAL MOLDS SILO CURBS
ADJUSTABLE SILL, STEP AND WINDOW
CAP MOLDS FRICTION HOISTS
And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.



London Standard Drum Batch Mixer No. 2 equipped with Steam Engine and Loading Skip

London Concrete Machinery Co.
Limited
19 Marmora St., LONDON, CANADA

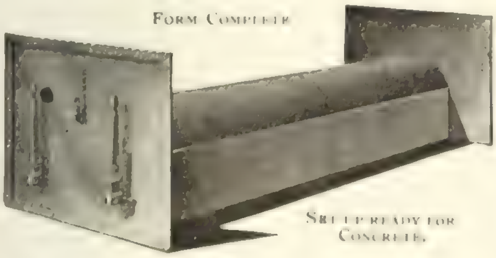
We are the Largest Manufacturers of Concrete Machinery in Canada

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.
Foss & Hill Machinery Co., 329 St. James St., Montreal.

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.

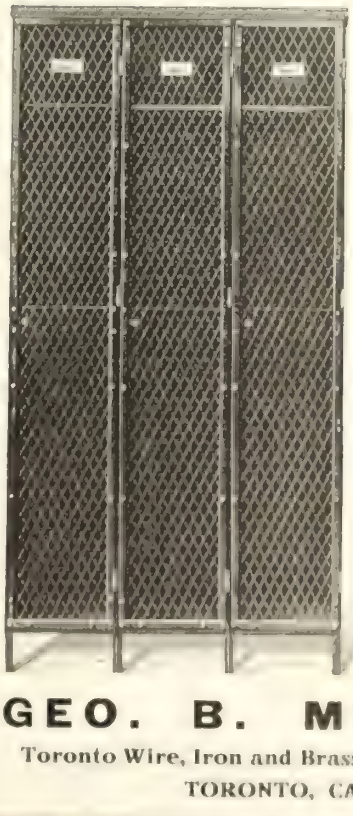


Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

Write for Form Catalogue
Engine Catalogue for the asking
Commissioner's Time Book Free

Concrete Form & Engine Co.
Successor to Collapsible Steel Form Co.
83 Congress St. W., Detroit, Mich.

'Meadows' Metal Lockers



Make friends because of their substantial construction and unique features. We make several styles and sizes of these lockers. We'll know what you want if you just hint at your requirements.

Send for our interesting booklet entitled
"Locker Lore"

GEO. B. MEADOWS
Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA

EADIE-DOUGLAS LIMITED

HEAD OFFICE: 12-14 University Street, MONTREAL

Building and Mechanical
Supplies and Specialties

BRANCH OFFICES:
TORONTO, - - 65 Victoria Street
WINNIPEG, - - 445 Main Street
OTTAWA, - - 198 Queen Street

REPRESENTING

Leeds Fireclay Company

Burmantofts Architectural Terra Cotta and Enameled Brick. Used by leading Architects and in representative buildings throughout Canada.

"Keystone" Fireproofing Company

Keystone Gypsum Partition Blocks and Furring. Fireproof. Soundproof, better and cheaper than Terra Cotta.

"Esco" Steel Coating and Preservo

A Waterproofing preservative paint for steel, wood and concrete. The solution of all paint difficulties. **PRESERVO—A preservative and waterproofing** for canvas.

"Terrano" Flooring Co'y of Canada, Limited

Terrano Jointless, sanitary flooring. Laid throughout the world, in hospitals, schools, hotels, private houses, power plants, factories, warehouses, etc.

Alphons Custodis Chimney Construction Co.

Custodis Radial Brick and Concrete Chimneys. Are in service in the largest plants in Canada and are lasting monuments to good judgement and business enterprise.

Edward Darby and Sons Company

"Pen Dar" Metal Lockers are the standard throughout Canada. The strongest and best constructed metal lockers, in all different styles and prices.

Mellows & Company Limited

Eclipse Lead Covered Clazing Bars for skylight Construction. Last a lifetime without any painting or repairing. MELLOWS STEEL SASHES AND CASEMENTS.

"Insulyte" Company Limited

A complete organization for the selling and installing all classes of insulating material.

B. F. Sturtevant Company (Eastern Canada Only) { **Sturtevant Electric Vacuum Cleaners,** simple, effiicient and lasting. Ventilating and Heating apparatus, engines, motors, etc.

Send for catalogues and descriptive matter on any of the above lines that you are interested in.

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

THE STANDARD Ideal COMPANY LIMITED
GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA

THE STANDARD Ideal line of Laundry trays is the most complete made.

All combinations are set up and fitted at factory before shipping.

Booklet showing roughing measurements sent on request.

Plate F. 353

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 July 12, 1911 No. 28

Reliance Upon Subordinates

Numerous contractors and indeed many of them with business of considerable magnitude, are very apt to attend to almost all the details of their various projects themselves, without taking anyone in their employment into their confidence to any notable extent. They know just how they have estimated on the work in progress or work for which tenders have been submitted and they know just how they intend to carry on the work to make a profit. But is there anyone else in their employ who can take their place should they be compelled to be absent for a week or a month? Has the foreman exact knowledge of where to buy the different materials and supplies, and on what terms? Does he know anything about the cost of doing the work and what amount should be charged for overhead expenses? Even though he might be able to finish up the work in hand would he be able to estimate on new work? In short would the business of the contractor come to a standstill because he were not able to give his undivided attention to the work?

The greatest mistake that any business man makes is not to have an understudy, a second boss who is able and ready to take up his work in case he should be called away. Some contractors seem so afraid that their foremen will know something about their business that they will scarcely let him know what they have figured on a piece of work, much less ask his assistance in estimating. They fear that if he learns too much he will start in business for himself and that next they would hear from him might be that his tender proved lower than theirs. A man is perfectly justified in wanting to better his conditions, and the foreman who has no ambition to some day take a contract for himself is not of much value as a foreman. Little hesitancy should be shown in taking advantage of any inclination on his part to assist in making estimates. In doing this the contractor is preparing his foreman to start for himself some time, and is doing it in such a way that will make him an intelligent competitor, who is far less likely to enter into cut-throat competition than a man who knows little or nothing of estimating or the cost of doing work. For instance, if he has learned to make sufficient allowance for general running expenses in making up an estimate, he will not be likely to approach this important matter vaguely when he starts in business for himself, and as an intelligent, conservative competitor he will do well-established concerns less harm than if he were ignorant of the real cost of construction work, and if his sole aim were to bid low enough to be awarded the contract, and then be tempted to skimp the work in order to save himself from serious loss.

Meanwhile, training foremen and office staff so that each may bear a more intelligent part of the business, and that each of them may have some real responsibility, will form a business into such a shape that should the absence of the heads of the firm be unavoidable, even though it be for months, the work will go on very much the same as though they were there for personal supervision, or at least it will be sufficiently well managed that a short absence would not prove disastrous.

Concerning Certified Cheques

The numerous comments that have been received upon the editorial, "Concerning Certified Cheques," published in June 21st issue of Contract Record, are unanimous in subject matter. Without dissenting voice, those whose interest prompted a reply condemned the practice, many of them suggesting it an absurdity that nevertheless had to be respected, Examples were cited that appear outrageous. Here is a sample. One engineer asked for a certified cheque for $500 to accompany the tender of a highly reputable firm for a contract which at most would not amount to more than a thousand dollars. Another requirement was that the cheque would be retained for nine months in lieu of a bond. The information goes on: "Can you imagine any firm tying up 50 per cent. of the amount of the contract for nine months in lieu of a bond and being paid on its contract as follows: 80 per cent. of the value of the material delivered monthly and the remainder 20 per cent. 30 days after completion and final acceptance."

Another letter instances a case where the contractor is obliged to furnish a marked cheque for 10 per cent of the contract price, amounting to $1200 and an additional bond of $10,000 upon signing the $12,000 contract. At present the marked cheque is not being returned, although the $10,000 bond would appear to be sufficient security for the satisfactory carrying out of the work.

For the sake of comparison we need merely repeat the conditions prevalent in England, where the sum of 3 guineas is in most cases sufficient to insure the bona fide intentions of the bidder. This cheque is generally returned to the unsuccessful tenderer upon return to the office of specification data and is always returned to the successful bidder. In no case is it retained longer than absolutely necessary, nor is it put into current use by the recipients. Frequently the contractor is asked to furnish additional security which is to be furnished by two corporations and to amount in all to only 10 per cent. of the contract.

The Moncton Times of June 20th calls attention to what it terms "A tremendous outlay proposed on a most unbusinesslike plan," in the following manner:

"The department of public works has issued a call for tenders for extensive work in the [illegible] at St. John, which will probably bulk up to [illegible] or [illegible]. Contractors are asked to put in bids for a dry dock and ship repairing plant of the first class, for the dredging of Courtenay Bay, for the construction of three steamship berths and of a breakwater. All are to be bid for in the lump. Contractors here are aghast at the proposal.

They say that only a firm which has an outside pull will have any chance whatever of getting the contract. It is pointed out that it will take more than a year, perhaps two years to do the necessary dredging before a stone can be laid for the steamship berths or dry dock.

The specifications are so indefinite also that a concern not having the benefit of confidential relations with the department of public works will be unable to make an offer that cannot be set aside for the benefit of favorites.

A deposit of half a million dollars is supposed to accompany each tender."

Turning to the question of withholding these cheques. One writer to the Contract Record has this to say: "What strikes me at the moment as being rather strange in connection with this certified cheque practice is that the cities like Toronto and Winnipeg almost always cash these cheques. In fact our bank manager informs us that he knows from experience that it is done 99 times out of a hundred by municipalities generally throughout Canada. As you know, these cheques are often kept for a long time after the contract has been definitely settled and the sum of the amounts are rather large (for instance when based upon 10 per cent. of the contract). It means that we have to pay each what amounts to a very large sum in the course of a year to allow cheques like these to lie dormant while the people to whom we have sent them are making use of our money."

Finally, the opinions of contractors in general on this important question may be summed up as in the following letter:

June 28th, 1910.

Editor, Contract Record:

I was much pleased to read the article on Page 35 in the Contract Record of June 21st, and must say that I agree in every particular with the remarks made.

Our company has frequently allowed contracts to slip past us altogether on account of the terms for tendering, especially the matter of certified cheques. I think the demand for certified cheques accompanyinfi tenders should be done away with, especially where companies are known to be reliable. I have seen tenders advertised where deposit cheques have been called for that would hinder any company with small capital from putting in a tender, and have felt that the motive has been to keep out competition. We have also experienced the need of capital caused through the demand for certified cheques.

FAIR PLAY.

Road Improvement

People all over Canada are more or less interested in the movement to ascertain what can be done to improve the condition of the highways, both in town and country, and may, therefore, desire, to learn something of the work that is being done in an older country in that direction. Under the heading 'Improved Country Roads,' the following remarks have been published in an English paper:

'Pedestrians, cyclists and motorists are appreciating the extension of tar-sprayed roads to the country districts, though as yet only a stretch here and there is met with. Experiments have been carried out on the main Gloucester road, about the best highway leading from the city, for years past, and it is agreeable to find that at last Somerset is following the lead. A mile of the road has been tarred in the Long Ashton village, and the improvement is such, that with motors dashing past, the dust raised is scarcely perceptible. A report was submitted to the surveyor at the district council meeting this week, and, there being three tons of tar left, it was amusing to find how eager members were that it should be utilized in their own particular parish. The outcome of the discussion which ensued was that any parish willing to bear the cost of the tar and the use of the machinery, could have free of cost the labor, the most expensive item. Seeing that the Surveyor holds that a coating would not only make the heavily worked roads more tolerable for the persons using them as well as for residents and property adjoining the roads but would also be economical, the wonder is that road authorities in the country districts do not more extensively adopt the system. As is the case in many commercial matters, the initial outlay prevents people adopting what in the long run is economical, to say nothing of improvements in other directions.'

The officials of the Canadian Pacific Railway report that since June 30th, 1910, nearly 500 miles of new lines have been built. The annual report of the company for the fiscal year of 1910 gives the total Canadian mileage of the railway at 10,270.6. The C. P. R. has now in commission in Canada 10,758.80 miles of track.

Equally satisfactory are the figures showing the new track mileage under construction by this company. It is reported that 1,023 miles of track are now being laid, of which 897 miles are single track. Of the balance in double track 11 miles are being laid in connection with Montreal terminals; 15 miles between Smith's Falls and Gletnay; 77 miles between Portage La Prairie and Brandon, and 23 miles between Pasqua and Caron. The last mentioned is probably the only extension that will not be completed and in commission this year. Of the double trackage at the Montreal terminals the greater part has been laid in the Place Viger yards. 95 per cent. of the grading on the Portage La Prairie line has been done.

The single line construction includes sections practically from ocean to ocean, 20 new lines in all being under construction. The longest of these is from Craven to Colonsay, a distance of 110 miles. Half of this has already been laid. The Outlook-Kerrobert extension which is 101 miles long will take some time to complete as it includes a big bridge at Outlook. A 46 mile extension between Forwards and Lethbridge is expected to be finished within a few months as 26 miles of track have already been laid.

Other branches which will be finished in a short time are Wardner northerly; Galloway to Waldo; Cameron Lake to Alberni; Tilston to Alida; Irrivana to Alberni and Coldwater to Bethany. The latter branch is 76 miles long and is being built as a new grain route from Victoria Harbor to Montreal. This is expected to be completed by the time this year's western crop is ready to be moved.

Wood Reinforcement for Concrete

Ligno-Concrete More Economical than Ferro-Concrete of Equal Strength—Opinions of English Engineer—Results of Important Tests.

Although the use of metal rods for the reinforcement of concrete has come largely into use during the past half century, it is known to have been applied as a reinforcing material by the Romans as early as 100 B.C. History gives us the information that a still earlier practice of the builders of antiquity was the use of concrete reinforced with wood. This dates from the construction of the great wall of China. Mr. G. O. Case, an eminent London engineer, has recently made a series of investigations upon its use and states his belief that ligno-concrete structures of certain types can be produced more economically than ferro-concrete structures of equal strength. A report of his work is given by Mr. F. J. Gray in The Surveyor.

Mr. Case about two years ago set himself the problem of finding for reinforcement a material at once equal to and cheaper than steel. His selection had to be made of one of the other materials or of the woods. None of the other metals of high tenacity possesses the advantage of cheapness over steel, but all the woods are cheaper than steel, and some of them are strong in tension. It is the practice to use wood members in tension in the lattice work of timber bridges, roofs, granaries, and similar purposes, and, as a general rule, when the members of such structures fail, it is not due to tensile stresses, but to shear. The tenacity of wood beams depends upon the fibres of the vascular tissue, and consequently it is greatest along the grain, those timbers being the strongest in which the fibres are straightest and most distinctly marked.

"Taking the tensile breaking stresses of mild steel to be 80 tons per square inch, the tensile strength per square inch, and the required sectional area of the hard woods may be stated in percentages of the value of steel:—

Material	Tensile strength	Sectional area
Mild steel	100	100
Tallow wood	21	476
Teak	19	526
Jarrah	19	526
English oak	13	769

The cost of these woods differ somewhat, but taking oak—the weakest in the list—to be one-thirteenth of that of mild steel per cubic foot, and allowing for 7.69 times the sectional area of steel, it is seen that oak is over 40 per cent. cheaper.

"In constructing a ligno-concrete beam, Mr. Case carefully embeds in Portland cement concrete, so as to leave no voids, four die-square wood tension pieces. These wood pieces have a sectional area calculated to render them somewhat stronger in tension than the usual steel rods of a ferro-concrete beam of the same dimensions. For example, he uses ¾-inch wood of square section in place of ¼-inch steel rods. These tension pieces he fixes in position either by means of iron straps or by wood ties, spaced at suitable intervals and fastened by screws. A framework is thus obtained, very convenient for use in moulding the concrete, but it is understood that rigidity of the framework is not essential to a ligno-concrete beam.

"Comparative tests have been made of ligno-concrete, ferro-concrete and concrete beams at the Brighton Municipal Technical College. Each of the beams tested measured 4½ inches broad, 4½ inches deep and 55 inches long. They had been made in the open air, in wooden moulds, and had been cast four at a time from the same gauging of concrete. The granite concrete used was composed of one part granite chips, one part sand and one-half part Portland cement. The wood reinforcements were arranged in the moulds so as to leave ¾ inch of concrete outside them, and the softer woods were immersed in water for a time to counteract the effect of shrinkage when encased in concrete. SiemensMartin steel was used for reinforcing the ferro-concrete beams. The object of the tests was to find the respective loads applied at the centre of a span of 42 inches at the time of initial cracking and of rupture, and the results obtained are tabulated below, in the order of the stresses. These tests amply demonstrate the efficiency of ligno-concrete; for they show that wood of suitable dimensions can impart to a concrete beam of a given size a tensile strength equal to that imparted by ordinary steel reinforcements.

Description of beam	Age of beam, days	Initial cracking load lb.	Maximum load lb.
Granite concrete, reinforced with four ¾-in. jarrah rods, connected by six ½-in. by ⅛-in. iron straps .. .. Remarks:—Crack gradually opened. Rods broke at maximum load.	10	850	3,300
Granite concrete, reinforced with four ¾-in. tallow-wood rods, connected by nine ⅝-in. tallow-wood cleats . . . . Remarks:—Four cracks gradually opened. Rods broke at maximum load.	10	1,050	3,150
Granite concrete, reinforced with four ¾-in. teak rods connected by six ½-in. by ⅛-in. iron straps Remarks:—Three cracks gradually opened. Rods broke at maximum load.	12	1,400	2,500
Granite concrete, reinforced with ¾-in. spruce rods connected by six ½-in. by ⅛-in. iron straps	6	Initially cracked in cartage	2,250
Granite concrete, reinforced with four ¾-in. oak rods connected by six ½-in. by ⅛-in. iron straps Remarks:—Cracks gradually opened. Rods broke at maximum load.	14	1,400	2,240
Granite concrete, reinforced with			

four ¾-in. ash rods connected by six ½-in. by ⅛-in. iron straps	12	1,000	1,800
Granite concrete, reinforced with four ¾-in. mahogany rods connected by six ½-in. by ⅛-in. iron straps	12	1,200	1,595
Remarks:—Cracks gradually opened. Rods broke at maximum load.			
Granite concrete, reinforced with four ¼-in. steel rods connected by 1/16-in. wire links	14	900	1,500
Gritty beach concrete, reinforced with four ¼-in. steel rods connected by 1/16-in. wire links	15	500	1,000
Remarks:—Cracks gradually opened. At maximum load steel rods bent up and concrete cracked off.			
Granite concrete not reinforced	10		650
Granite concrete not reinforced	12		425

"Among other experiments which Mr. Case has made were some for adhesion. He found, on cutting away the concrete from ligno-concrete beams three months old, that the adhesion to the concrete of the woods—both hard wood and soft wood—was perfect. The coefficient of contraction of concrete setting in air is given by Considere as 0.0005 and this contraction probably counteracts the small shrinkage of hard wood or of creosoted soft wood. On this account the wood reinforcements have no tendency to fail by shear, and their full tensile strength—which is considerable—is exerted before rupture under the breaking stress.

"It is too early now to require practical proof of the durability of ligno-concrete structures; but evidence is available from which its durability may be inferred. The wood reinforcements can rot only by moisture passing through the concrete from outside. The steel rods in ferro-concrete, which in this sense are analogous, are known not to have rusted in cases where the ferro-concrete was several years old; and there is no reason to think that the wood rods would be affected to any greater degree. Certainly it might be prudent to creosote soft woods to prevent them from absorbing any moisture from the setting concrete; but the hard woods would take up practically no moisture from that source. It is certain, too, that dry rot cannot occur provided the wood is well seasoned, or its sap removed and replaced by a preservative; and it is obvious that wood imbedded in concrete cannot decay from the action of germs in the atmosphere.

"Mr. Case estimates the selling prices, at Brighton, of piles and beams made of ligno-concrete, ferro-concrete, pitch pine, and oak to be as follows, per cubic foot: ligno-concrete, 2s. 3d.; ferro-concrete, 2s. 7d.; pitch pine, 2s. 6d.; and oak, 3s. 6d. Hence, ligno-concrete is over 16 per cent. cheaper than ferro-concrete, and over 38 per cent. cheaper than English oak. It appears, therefore, that in ligno-concrete the requisite properties are combined, fitting it to become a substitute for timber in building construction. It possesses great strength, and is more economical and more durable than timber . . . . .
Wherever costly hardwoods have been used in the past for piles, beams, and the like, the application of ligno-concrete appears to be indicated in the future; wherever timber is required for harbor works, wharves and groynes, ligno-concrete may be adopted economically; wherever fencing and similar works involving a great consumption of materials, are continually being constructed, ligno-concrete may be employed to the benefit of afforestation; and, in short, ligno-concrete is calculated to supersede timber work to the same extent as ferro-concrete has superseded structural steel work."

City Planning

Montreal recently had a visit from Mr. Dunnington-Grubb, B. S. A., who has just resigned the superintendency of the improvement work now being carried out in connection with the Peace Palace at The Hague. He is touring Canada for the purpose of studying conditions in our large cities. He has the reputation of being one of the leading landscape architects in Great Britain and his wife stands almost as high in the profession as he does. It is said to be the intention of Mr. Dunnington-Grubb to take up the practice of his profession in Montreal at the conclusion of his trip to the Coast.

In an address delivered at Westmount during his stay in Montreal Mr. Dunnington-Grubb expressed himself very strongly against the square block design of cities. Such an arrangement, he said, did not lend itself to distribution from the centre of the city. The square block was usually adopted regardless of topography. He favored a system such as existed in Paris and Vienna where the streets radiate from a centre to circular boulevards. It was not, however, merely wide boulevards and beautiful public buildings that were needed to make a city lovely and healthy. These would be useless if the masses of the population were herded in insanitary tenements where they were deprived of abundance of fresh air and sunlight. Modern town planning should be made to control individual enterprise so as to secure the greatest amount of health, happiness and prosperity for every individual in the community. The lecturer also touched on transportation, production, economy, land ownership, and the distribution of the land in a city. The traffic and transportation problem was one that required careful study and a wise solution, and the sooner this question was faced squarely and manfully the better for the community. He referred to the fact that the city of Paris had granted 300,000,000 francs for new embellishment schemes; the new Australian capital also was paying due attention to this important subject. Experiments were being tried in Chicago with the object of doing away with mercantile transportation in the centre of the city. Overhead traction, the lecturer said would, he believed, find no favor. Quite apart from aesthetic considerations it was imperative that nothing should interfere with the free circulation of air and the free access of light to all living places. Multiple decked streets we would undoubtedly have, but traction should be carried on below the thoroughfare rather than above it. The highest level in the street should be the pavement. Immediately below this he would suspend the entire system of pipes required for civic purposes including electric cables, water service, compressed air and vacuum cleaning tubes. Lower yet would come the electric goods transportation service communicating with all houses underground, while at a still lower level rapid transit service would be installed. Above the street the air would be as pure as in the open country.

Progress of the Toronto Filtration Plant

Work will be Completed in October The Quantity of Concrete Assuming Gigantic Figures Fifth Article of the Series upon this Enterprise,

Special to the Contract Record.

It will be remembered that as far back as 1896 Mr. Mansergh, the eminent English engineer, recommended obtaining a supply of water from Lake Ontario, this supply to be filtered before delivering to the city. The advance in the science of water purification since that time has been marked and the plant now nearing completion at Toronto embodies the latest ideas on the subject. For the purpose of recapitulation it may be stated that the plans were prepared for the city by Mr. Allan Hazen, as consulting engineer to the City Engineer, Mr. C. H. Rust. The contract for the complete plant was awarded in May, 1909, to Messrs. Dill, Russel & Chambers, Toronto, who commenced operations almost immediately, and have employed a large gang of men throughout the past two summers and well on into the winter months. Mr. A. Richley, who has had a wide experience in work of this nature, is in charge of the work for the contractors. Mr. F. F. Longley is engineer in charge for Mr. Hazen.

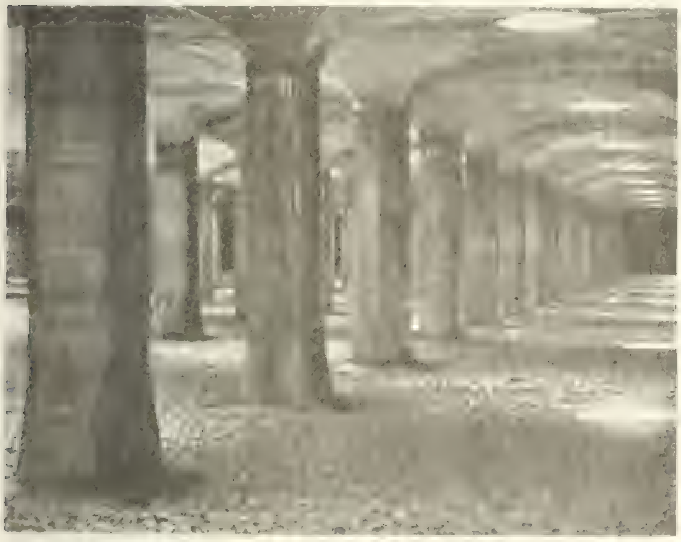


Fig. 1.—Filter beds showing first layer of broken stone

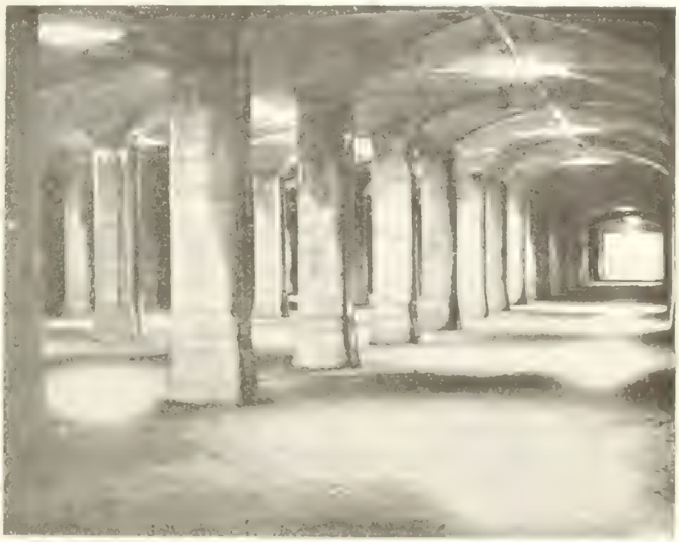


Fig. 2.—Filter beds containing 3 layers of broken stone and gravel

The water problem in Toronto has been the subject of innumerable suggestions for some time, and the clarion "boil the water" has in no wise become as great a nuisance as the means of obtaining pure water is a handicap. Since the publication of the last article of this series (see Contract Record, September 28, 1910), the construction of the filtration plant on Centre Island has taken on the appearance of being in a fair way toward completion, and the finishing touches will in all probability be applied in the course of a few months.

The plant has been described in detail in previous articles as to general plan and layout. It will be remembered that from the pumping station the water to be filtered will flow through a 72-inch reinforced concrete pipe, from which two 36-inch branches are taken off at right angles to the inlet pumps under each filter entrance. There are twelve of these filters, each 117 by 213 feet in plan. These are grouped equally on either side of the regulating houses and sand bins. Each filter has an inverted groined arch floor and a similar ceiling, the latter supported by square concrete piers 13 feet to centres.

The water upon leaving the 36-inch branch at the entrance to the filter is spread over the surface of sand to a depth of 6 to 8 inches, and is then obliged to filter through three feet six inches of specially cleaned and graded sand. Under this there are three layers of broken stone and gravel to a depth of about 12 inches, the lowest layer consisting of about seven inches of 2-inch clean-washed broken stone as shown in Fig. 1. Fig. 2 shows the interior of the filter with these three layers in place and ready to receive the sand.

Upon reaching the broken stone the newly filtered water is collected in 10-inch split tile or channel pipes, which drain into a main pipe at intervals of 13 feet. This main drain is built of concrete and is about six feet in width. It carries the water through a 24-inch cast iron effluent pipe to one of the regulator houses. Each of these pipes is provided with a reinforced concrete Venturi meter. The regulator houses will fill a very important function in the operation of the filtration plant, containing as they do the outlet pipes and controlling gates of the several filters, the means for controlling and refilling the filters after cleaning, as well as the device for obtaining an accurate measure of the velocity of the water through the filters. From there the water will pass to the pure water reservoir, an illustration of which is shown in Fig. 3. This shows the piers in place and ready for the roof, which has since been completed and appears in Fig. 4. This pure water reservoir is 312 feet square, covering an area of 2¼ acres. The floor contains over 2,500 cubic yards of concrete, the roof concrete being the same. There are 529 piers (see Fig. 3), each 13 feet high, and spaced 13 feet centre to centre, each way. The walls are 14 feet high and average nearly three feet in thickness. The floor level is about seven feet below the ordinary level of the lake. The water when it reaches this reservoir is filtered and ready for use.

For the operation of the filters a constant supply of washed sand has been provided. Four circular storage bins were constructed, each of which has a capacity of 612 cubic yards, an inside diameter of 34 feet and a depth of 21 feet.

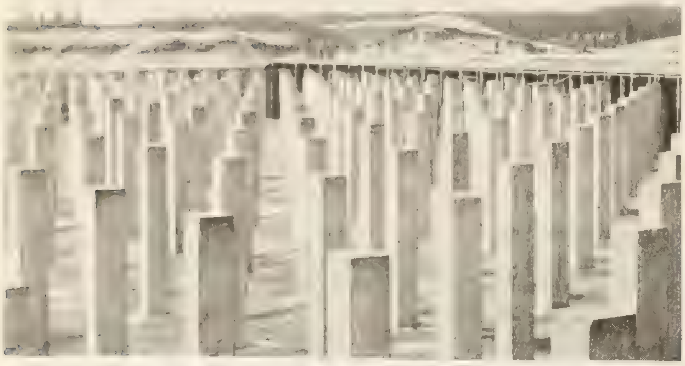


Fig. 3.—Pure water reservoir before roofing

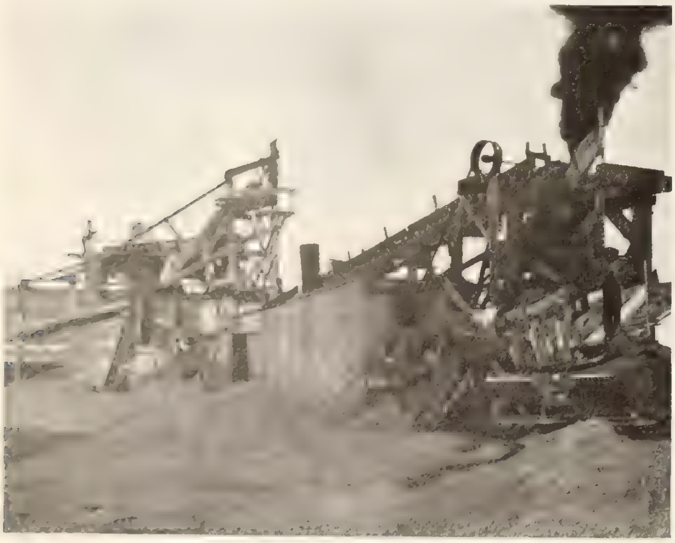


Fig. 5.—Screening plant for coarse gravel.

Returning to the operation of filling these filters, Fig. 5 illustrates the screening plant used to obtain the layer of 3-8 inch gravel which forms the top layer of the coarse material in the filters. The material used was the screenings from the screens providing concrete material, and was carried from a chute by an endless belt up an incline and dropped upon vibratory screens on which water was sprayed to remove all dirt and sand. Figs. 6 and 7 show the plant for rendering the filter sand ready for use. The crude material is delivered to this plant through pipes from a large dredge to a gradually widening table, which has the effect of reducing the velocity of flow from the pipe. The coarser gravel settles through an opening and is carried to a screen by a drag operated by an endless chain. The remaining material passes into a large V-shaped box, the dirt and the finer sand flowing over the top with the surplus water. The heavier sand and fine gravel settles to the bottom of the box and is carried by spigot pipes to a washer box. Here water pressure is applied to the bottom of the box and the remaining fine material removed. The sand is then elevated by bucket conveyor to storage bins and from there by cars to the filters.

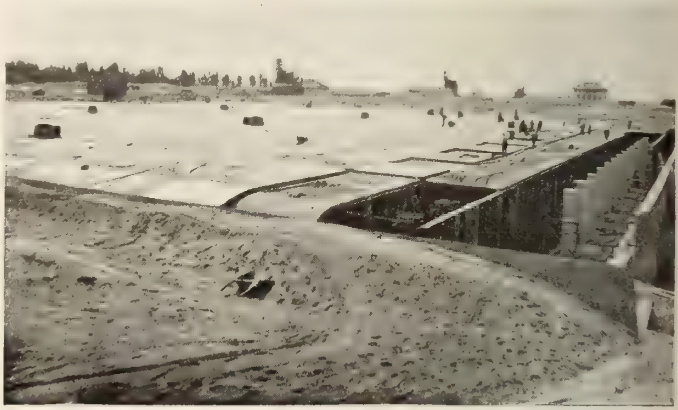


Fig. 4.—Pure water reservoir with roof in place.

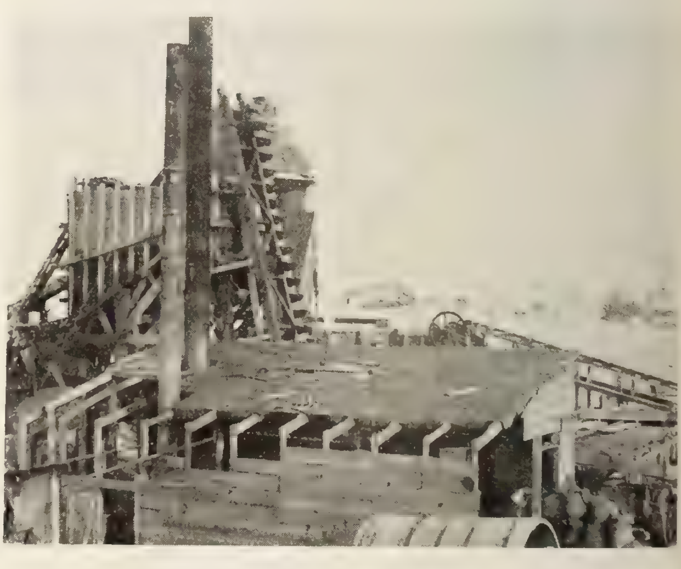


Fig. 6.—Washers for filtered sand.

The laying of the 72-inch concrete pipe connection from the pure water reservoir to the present city intake is illustrated in Fig. 8. This was a particularly difficult piece of work as the bottom of the trench was 13 feet below the lake level and the proximity of the lagoons made it difficult to handle the water, especially as the main trench crossed the drainage canal, which surrounds the whole plant (its total length being 4,000 feet), and the water had to be kept low in this canal to permit of the whole operation of the work being carried on as usual.

Since our last article on this subject was published, about 300 men have been constantly engaged in the various portions of the work. Very rapid progress has been made in the concrete work, the total quantity placed being nearly 45,000 cubic yards.

Laying of 72-inch pipe connection to city intake

Considerable interest has been evinced in the construction of the sand washer plant, previously described, in the design and construction of which the contractors were assisted by Professor Haultain, Engineering Faculty, University of Toronto.

At the present time the pure water reservoir is completed. The pumping plant in the pumping station is practically all installed. Eight of the twelve filters have been completed so far as the concrete work is concerned, and the other four will be finished in a month's time. Two have been filled with sand, and it is expected that everything will be ready for operation early in October.

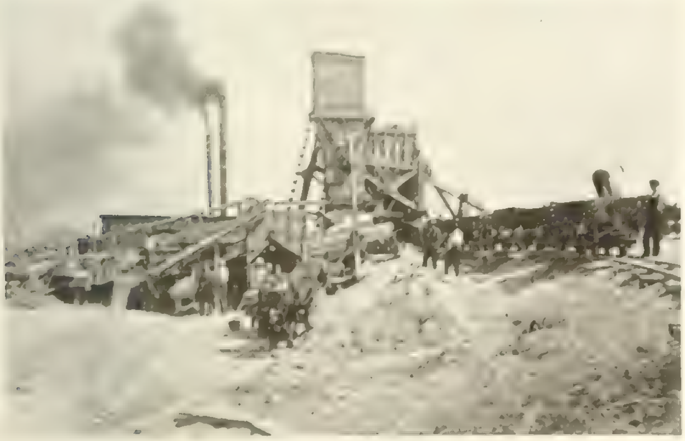


Fig. 7. Washers for filtered sand.

Owing to a shortage of cement and unfavorable weather conditions the building returns of Edmonton show a marked decrease from those of the month of May.

Reinforced Concrete as a Sound Deadener

The charge has been made against reinforced concrete, that it transmits sound too readily, and is therefore not adaptable to dwellings, halls, etc. The sound waves penetrating into a solid body are propagated with less loss, the more homogeneous a body is. The various degrees of sonorousness are only functions of the surface hardness of the body which receives the sound waves. Thus wood transmits sound less than iron, because it reacts less to the activity of the shock as the sound waves strike it. The same applies to reinforced concrete. It is much less sonorous than iron, and reinforced concrete reacts infinitely less to the action of the sound waves than any other material. Concrete is of such a heterogeneous composition, that it does not take up the sound waves that strike it, and therefore, does not send them along as iron does. If there are any transmitted, they are transmitted in such a bad form that they have no influence at all upon the acoustic qualities of a room. Perfect deadness to sound can be obtained much more easily in a concrete building than in an iron one. It is only necessary to interpose a very thin body between the concrete and the sound to get this condition. A simple linoleum placed upon the floor of a concrete building, is sufficient to ensure perfect deadness to sound. This is impossible to obtain in a frame structure. However, care must be taken to avoid cement or brick floors placed directly over reinforced concrete floor-beams, for the change of medium in this case will transmit sound and counteract the good effects of the concrete. There is no reinforced concrete construction that cannot be made soundproof with a little care and thought. On the other hand, it is impossible to reach complete deadness to sound in construction where the metal is the predominating element. Iron transmits sound so perfectly that it is next to impossible to reach the desired effect as can be done in reinforced concrete.—Le Ciment Armee.

Relation of the Contractor to his Foreman

Good Foremen are Money-Savers—They Lower Cost by Increasing Efficiency—The Question of Bonuses as Incentives.

By Daniel J. Hauer.

In contract work, or in fact in any class of construction, the foreman factor is an all important one. Thousands of men are thus employed, and the employer is entirely dependent upon the foreman for the handling of all details of his work. Their success means success for him, their failures and shortcomings mean money losses for them. Frequently we hear foremen and contractors say that although a profit has not been made upon a certain piece of work yet a loss has not been sustained.

The writer has always asserted and maintained that if a profit has not been made by a contractor, that money loss has been sustained, as in the contracting business it is not possible to stand still. We must either go forward or else we take a step backwards. There may not be a direct loss on the job, but the indirect loss may soon show itself and be keenly felt. To illustrate: A railroad contractor with a twenty team scraper outfit undertakes a contract to build a section of a road, and at the end of a year's work he draws his final estimate and balances his books he finds his profit and loss account is balanced and he congratulates himself upon the fact that although he has not made a profit yet he has not lost money. But he has. His money is worth money and if interest has not been earned on the capital invested that much has been lost . His time, too, is worth money, and if a profit has not been made to recompense him for the time and thought put upon the job, he has lost money. During the year, the horses and mules and the scrapers and other tools have been exposed to all kinds of weather and worked to the utmost, so that they are not as fit to start a new job as they were before. In other words they have depreciated in value. This is a money loss that soon makes itself manifest. Thus the contractor's time has gone for naught, and his capital has depreciated so that he has sustained serious losses.

A contractor must always be attentive to his duties, but his close attention means but little unless his foremen are alert and try to work for his best interests. Many foremen state that if they cannot make money on a job for a contractor they want to resign. This is as it should be if it is the fault of the foreman, but if it is not, a foreman makes a grevious mistake by resigning when a job is not netting a profit. At times a contractor underestimates the work and takes a job at prices that are so low, that it is not possible to make a profit, and there are occasions when unforseen conditions exist or accidents occur that turn a seemingly profitable contract into a losing one. There are circumstances over which a foreman has little control and if his labors do not show a profit he is not to blame, but on the other hand he should not desert the ship when disaster overtakes it, but rather put his shoulder to the wheel by concerted action with his fellow foremen and with his employer, the contractor, pull the job through with the least possible loss. A foreman's reputation is not injured by being employed on a losing job, unless money is lost through his fault, and if he leaves the job at such a time, he will suffer in reputation and he will soon be known as a "quitter," a man who gives up as soon as he encounters difficulties. To continue work will help to make his reputation, but those interested will learn of the circumstances even if he says nothing about the facts.

With easy work, good men, efficient tools and machinery it should not be difficult for any foreman to make money for his employer, but with adverse conditions, when good men are discouraged and with worthless laborers and a run down plant, a foreman who can then bring a job through to completion at the lowest possible cost shows he is a man of marked ability. It is only by overcoming difficulties that we learn, and on a job where there is only trouble and loss, a man has a greater opportunity to learn and make a reputation for himself than where things run smoothly. Bitter and costly experience is the most valuable to us. George Washington showed his great ability at Valley Forge rather than at Yorktown. Valley Forge made Yorktown possible.

Good Foremen Are Money-Savers

Many examples in the contracting business can be cited to illustrate these things. Only recently a contractor was losing money on a heavy piece of construction work located in the east. He himself was ready to give up the work, when he succeeded in obtaining a superintendent or general foreman who was not afraid to be employed on a losing contract. This man reorganized the work, obtained for the contractor certain concessions from the owner, changed the methods of doing the work and ended by turning a losing contract into a winning one. His reputation was materially enhanced so that when he stepped out of his position he went to another job where heavy losses were being sustained, and once more so improved conditions that a profit was made on the job in the end. This man will never lack work, but what would have been the results if he had said, "I cannot afford to let my reputation suffer by working on a money losing job."

A foreman should always be alert to learn and should welcome advice. No matter how long we have been following a particular line of work, there is always something to learn. At all times we should be willing to learn new work and be ready to give it a fair trial. If they are not money-makers they will soon demonstrate the fact and they can then be discarded. Even an artist can learn from a cobbler. Many foremen will take orders from their superintendent and employers as to what work to do, but they will not allow themselves to be advised or instructed as to the methods of doing their work, acting as if those above them could not possibly know more than they do. Granting that this is the case, it is wrong in most cases not to follow the contractor's orders or advice as it is his money at stake and not the foreman's, and it should certainly be the privilege of the contractor to decide how his money is to be spent, when he wishes to assume that responsibility.

There are times though that a foreman might be justified in ignoring orders or even in directly disobeying them. To illustrate: A foreman asked permission of a contractor to allow him to send a well-drilling machine to drill blast holes for blasting in front of a steam shovel and making holes for deep blasts. This was before the days of using these machines for that class of work. The contractor absolutely refused to allow such a machine to be brought onto his job. The foreman did not argue the question, but as soon as his employer left, he went off and hired the well driller and put it to work. A week or so later the contractor again visited the job and one of the first things he noticed was the well driller at work on a hill. He at once inquired who had hired the machine and when told it was the foreman, who had asked permission to do so, the contractor at once ordered him dismissed for disobedience. Upon being discharged the foreman went to the contractor and told him that in many ways he had done the proper thing in discharging him, but at the same time he had proven he was right, for with the machine he had materially reduced the cost of drilling and had saved in a short time several thousand dollars. Upon investigation the contractor found this was true and he at once ordered the foreman to be taken back and placed in charge of all drilling. He also gave orders to purchase a number of these machines. A short time after this one of the leading engineering journals published a description of the work done by the well drillers on this job, with the result that such machines have been employed on contract work in this country ever since. Here was a justifiable case of disobedience. A case showing that the foreman was a man of his convictions and willing to sacrifice himself to prove that he was right, and by doing this, gave the construction world an efficient tool.

The cost of foremen to a contractor is a heavy item in his expense account. The smaller the job the larger is the proportionate cost for a foreman. In earth and rock excavation this expense may sometimes amount to several cents per cubic yard and may be no inconsiderable part of the total price the contractor may receive for his work. It lies entirely with the foreman to lessen this cost. Not by taking less wages, but by increasing the efficiency of his forces and the machines that he has in charge.

The wages paid to a foreman should hardly be taken into consideration, provided he obtains results. To hire a foreman because he can be employed for a low wage is false economy. His ability should be considered and if he is found to be efficient and experienced he should be engaged.

Hiring foremen and deciding upon their wages is a most important subject. It is difficult to judge a man's ability as a foreman from his appearance and a short talk with him. Most of them are very apt in telling of the work they have done and of how they can manage men and obtain remarkable outputs from machines. Good foremen are always scarce and when in need of one, if it is not possible to obtain a man that is recommended by some other contractor or engineer, or one who is known, it is necessary to employ a foreman who may apply for a job. He is an unknown quantity, and it is always a question as to what salary to pay him. A contractor is not looking or rather should not be looking for a low priced man, but at the same time he does not want to pay a man who may be inefficient and be discharged within a week or two a large salary. A good method in such cases is to employ a man, say at a daily wage of three dollars, and tell him that if he proves satisfactory within a month he will be paid the standard wages of four to five dollars per day. A man without a job cannot object to being employed in this manner and the contractor protects himself somewhat by this method.

Some contractors pursue this course, and when they secure a good man soon place him on a monthly salary instead of a daily or weekly basis. This means the man has regular employment even during bad weather, and receives a stipulated salary. When work has to be shut down or the contractor finishes all his jobs without obtaining new ones, the best of the monthly men are selected and left on the pay roll and given such work as overhauling outfit and repairing and painting tools and machinery.

Value of Weekly or Monthly Bonuses as an Incentive

Some contractors find that they can not only get the foremen to take greater interest in their work, but the foreman obtains more work from his men and machines by paying the foreman a bonus when he gets better work done. These bonuses are paid for either weekly or monthly work.

In doing this the writer's practice has been to keep a very detailed account of the cost of each foreman's work. All labor, teams, supplies and other expenses are charged against the foreman and the section or part of work he has charge of, at the same time records are kept of the work he does. These daily records are checked against the engineer's estimates, so that the daily records cannot be padded without detection. In this way it is always possible to tell if a foreman is making money for his employer, and it is also the basis for starting a system of rewarding the foreman with a bonus for making extra money. Then, if the foreman does not come up to a certain standard or show a profit on his work, there is cause for discharge.

It is quite surprising to those who have never used this method to find out that many so-called "good foremen" do not show a profit on the work they do each month. On one job of railroad work done by the writer he employed nine foremen, and in order to obtain efficient men he used this method Three good foremen resigned their positions to take better ones during the job and to obtain the twelve men who proved satisfactory, seventy-seven different men were tried out. A few who showed a profit on their work were discharged for drunkenness.

Such a method keeps a foreman anxious to obtain results and there generally springs up a friendly rivalry between the different foremen doing the same class of work. They also study their men to learn what kind of work the man is best suited to do.

Some years ago the writer had a number of foremen who each complained that one or two men in his gang were not doing good work and should be discharged. In every case the men had been employed for several years, many of them longer than the foremen. Laborers were scarce and it cost from $15 to $20 transportation to obtain new ones. The writer, consequently, decided to change his organization for a short time. He selected a foreman who quickly sized up men's ability and gave him the men whom the other foremen were dissatisfied with, to use in his gang, dividing his men among the other crews. This foreman worked these men for about three weeks and showed more profit from their work in that time than either he or any of the other foremen had ever made in a month. He was anxious to keep these men under him, but the other foremen seeing how their old men were handled and the results obtained, clamored to have their men back and the old organized gangs were formed again, and every foreman got better results from that time on.

The test of a foreman showing a profit on his work each month is a hard one on most foremen. A contractor employed the writer to increase the efficiency of his forces, and he quickly found out that many of the foremen that the contractor believed to be his best ones, really showed a loss on their work each month or the profit was so small that they hardly covered the overhead charges. It was difficult to prove to the contractor that such was the case. One man who was considered an efficient blaster lost money each month on his blasting, due to ignorance of handling explosives.

General foremen or superintendents are employed in most cases on monthly salaries. However, many of them are paid a percentage of the profits made on the job in addition to their salary. This is a bonus to obtain better work from him, and it is generally successful. However, some contractors who do this will not consider paying a bonus to a foreman. If the method works well with the superintendent it will also improve the work of the foremen, and the writer has gone farther than this, by applying it to the laborors themselves.

One great advantage in the last named case is to materially decrease the foreman cost. Men working to make a bonus can be worked in larger gangs, so that the foremen's wages are distributed over a greater amount of work, or by the bonus or task system a few men can be worked at a task, and a foreman's time divided among a number of such gangs, while by the ordinary method foremen must give close surveillance to each man.

The day for a foreman to swear at and beat his men is past. With some he may have to be emphatic, and at times harsh, others may be stirred to quicker and more work by praise. A foreman should study the temperament of each man under him, and handle him accordingly. No two men can be controlled in exactly the same manner. Words of praise are essential to both foremen and men. They are valued as highly by employees as the contractor values commendation from the engineer under whom he is working. Remember that a laborer is a man, and as he is on the lower round of the ladder of life he feels his position keenly and is quick to resent any slight or seeming hardship.

Great care and consideration should be given to placing foremen in charge of certain work, as frequently foremen are given work to do for which they are entirely unsuited. One man may be competent as a sub-foreman and yet be a failure in charge of the whole force, and a man may be successful in running a scraper force, when the teams are owned by the contractor, yet may prove a dismal failure with hired teams. These things are not really the foreman's fault, but rather the contractor's, as the latter should be a quick judge of a man's qualifications and his disposition.

Training Essential to Success in This Position

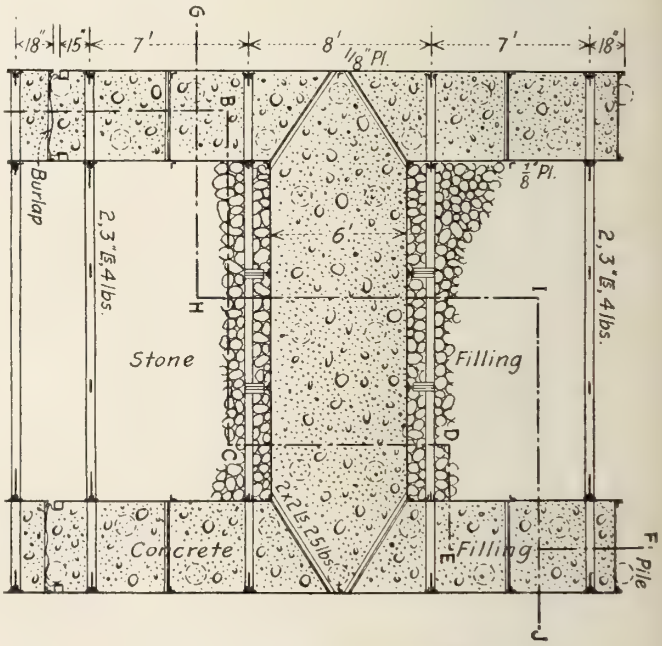
Many contractors make the mistake of making foremen of good active laborers, the so-called leaders of their gangs. They generally ruin a good laborer and make a poor foreman. The proper way in such cases is to encourage such men by increased pay, then to make them sub-foremen, then assistants, and finally after this training, promote them to be foremen. The chances are that they will be good ones, as leaders who rise from the ranks by hard work are as a rule competent.

There is no doubt a great field open to young, industrious men of the country to fit themselves for foremen on construction work. Contractors in all sections of the country are continually on the lookout for foremen of ability. They prefer young men whom they can teach their methods. It is to be regretted that many people think the title of foreman a reproach. It is not, and it is as honorable a position as that of clerk or manager. Young men should not hesitate for any such false notions. Their chance of promotion is great, greater even than that in the engineering field.

With less education than that needed for engineering, a young man can start as a foreman and rise higher and quicker. From foreman he can go to superintendent, general manager and become a contractor if he wishes, better equipped for success than through any other channel. Should he possess an engineering education or training it will be an aid to him. The supply of able foremen falls short of the demand.

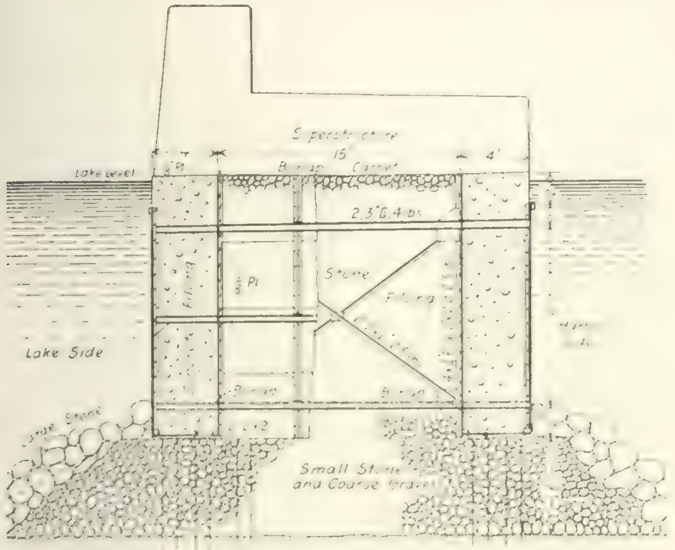
Steel Forms of Concrete Breakwaters or Piers

The accompanying drawings show the details of a system of steel forms for building concrete cribs for piers or breakwaters, designed by Mr. E. J. Duffies, M. Am. Soc. C. E., U. S. Assistant Engineer now stationed at Harbor Beach, Mich. It is intended that they be used to sink on prepared foundations, be filled with concrete and broken stone and then topped with a concrete or stone masonry upper works as desired, leaving the steel forms in place to rust away.

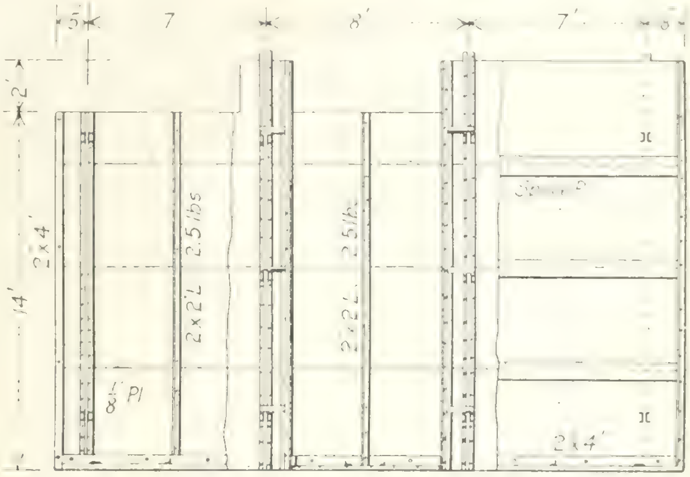


Plan of Steel Form with Filling.

Each form is in H-section, the legs and cross bar of which are of structural angles and other shapes, covered with steel plates and braced inside and together with angle struts as shown. Each section is to be fabricated in handy size on shore, floated out to its location on a barge and dropped, by derrick, into place on the foundation. The legs and cross bar of the H are then to be filled with concrete and the intervening spaces with broken stone. The upper outer 2-ft. of the form, on both sides is to be removable, so that only concrete will be visible above the water line.



Cross Section G-H-I-J.



Longitudinal Section A-B-C-D-E-F.

Section Details ot Steel Forms.

The foundation is to be of the type used in this class of construction. Where the bottom is sufficiently solid, the form may be let down directly upon it with no further preparation than leveling, but ordinarily a broken stone bottom, either plain or piled, will be needed. When a stone foundation is used, the bottom of those cells of the form to be filled with concrete are to be covered with heavy burlap carpeting, so as to hold the concrete from oozing out through the stone. This burlap, while secured firmly to the form, should be ample in width so that it can accommodate itself to the irregularities of the foundation and not tear when the concrete is dumped upon it. Burlap is placed in the legs of the last form set, adjacent to the preceding form so that no concrete will waste between the forms, also so that the concrete will force itself into the irregularities of the preceding form and thus tie the two forms together. Burlap is also placed over the stone filling in the centre of the forms to prevent the concrete of the superstructure running down between the stone.

The advantages claimed for these forms are the ease with which they can be erected and placed, and their cheapness. As they have only to do temporary service the unit stresses used in their design may be very high, and the loads they have to support, that is the pressure of concrete under water, is much less than what ordinary above-water concrete forms have to bear. They may be built on shore at any time and placed only in calm weather, so that no extra strength has to be added to care for wave action. They must be strong and stiff enough to permit of being handled by a derrick preliminary to sinking, but if the other strength requirements are adhered to it is probable that the forms will be sufficiently strong and stiff to stand handling.

The section shown in the drawing is for the intermediate portion of a pier or breakwater, and not for the first or the last form, which would have to have some slight modifications in details. On the drawings also a portion of the sway bracing probably necessary has been omitted. The connection to succeeding forms, as shown at the lower end of the plan, is not integral, but consists merely of a butt joint, with the burlap to permit of expansion between the two sections. In placing the forms, the end adjacent to the preceding form will be held to line and grade by proper guides, while the outer end can be alined in the usual manner. The outside end can be leveled and held to proper grade by two jacks made for this purpose. The forms are to be filled with concrete by buckets or tremies dumping under water. The designer estimates that it should take about an hour to set the form and perhaps five hours to fill it with concrete. The stone filling could then take place at any time as the form would be firmly anchored by the concrete filling.

The form shown in the drawing, for a breakwater or pier 23 ft. wide and about 16 ft. deep, made in 25-ft. lengths, would weigh about eight tons. With flat outside plates this is estimated to cost as follows:

172 cu. yds. concrete (aggregate) @	$4.50	$ 774.00
206 bbls. cement	1.50	309.00
411 cu. yds. stone filling	2.00	822.00
24 piles	12.00	288.00
8 tons steel	80.00	640.00
		$2,833.00

Equivalent to $113.32 per lin. ft.

A superstructure of the size outlined on the plans could be built for $38.62 per ft. If corrugated steel plate be used there would be some reduction in cost. —[Engineering News].

The record for quickest erection and inclosing of anl 8-storey building is claimed by the contractors of the Underwood building, at Vesey and Church street, New York. The structure is an office building, 52 ft. by 76 ft., and about 220 ft. high. The steel superstructure was erected and inclosed with stone and brick in 69 days, chiefly in December and January, under unfavorable conditions of weather and daylight, snow storms and extreme cold making work impossible some days.

Bituminous Highway Construction

Investigations as to Suitability and Cost—Water-Bound Macadam Versus Asphalt Poured Macadam—Methods of Application.

The form of construction involving the use of bituminous compounds has hithertofore been looked upon as entirely experimental. According to "The Contractor" the Illinois Highway Commission during the last few years have constructed numerous roads for determining the following questions.

1st. The general desirability of the poured asphalt or tar macadam road as regards dustlessness, resistance to wear and comfort of travel. 2nd. The relative cost of the water-bound macadam and the tar or asphalt poured macadam. 3rd. The relative cost of maintenance of water-bound macadam and the poured asphalt or tar macadam. 4th. The suitability of an asphalt oil in the construction of earth roads.

In the construction of bituminous macadam roads it was decided to confine the experiments entirely to the poured macadam. It is a matter of common observation that on roads which are traveled exclusively or almost exclusively by farm teams, the traffic confines itself to seven or eight feet of the width of the road, the wheel wear coming entirely upon two strips of the roadway which usually do not exceed two feet in combined width. Where this concentrated traffic is encountered, there is a marked tendency for bituminous macadam to squeeze out along the wheel track, forming a broad depression. The wear also must necessarily be great where the vehicles all follow the same track. This depression will eventually become deep enough to hold water which hastens the deterioration of the road. On village streets there is no such tendency because the traffic must necessarily spread out because of the constant passing. Where these conditions are encountered, it is essential to design a poured macadam pavement so that the lower course shall give stability and the upper course provide a durable wearing surface so placed that the opportunity for lateral displacement of the stone composing it is reduced to a minimum.

Four sizes of stone are used in the state experimental bituminous roads as follows: Stone passing over a 2-inch screen and through a 3-inch screen, designated as 3-inch stone; stone passing over a ¾-inch screen and through a 2-inch screen, designated as 2-inch stone; stone passing over a ¼-inch screen and through a ¾-inch screen, designated as chips; screenings that pass through a ¼-inch screen, sometimes containing a percentage of chips.

In general, bituminous macadam roads have been made about 9 inches thick at the crown line and about 6 inches thick at the edge after rolling. The stone is placed in two courses, the top course of 3-inch stone being 2½ to 3 inches thick after rolling and the lower course of 2-inch stone being 6½ inches thick at the crown line and 3½ inches thick at the shoulder or curb line after rolling. The lower course is spread, harrowed, rolled and bonded with water and screenings in the manner of an ordinary water-bound macadam roadway. It was learned early in the experiment that an essential part of this form of construction is to have the top course of uniform texture, and it was found that herein lay the greatest difficulty in the construction; unless every detail is carefully watched from the inception of the project, it is certain that there will be a lack of uniformity in this upper or wearing course. In order to insure absolute uniformity in thickness and texture of the upper course, evidently the lower course must be laid very carefully and finished absolutely true to cross section and grade in every particular. The top course of stone must then be spread with great care so as to insure uniform thickness, it must be harrowed to bring a uniform sized stone to the surface and then be rolled until it is well keyed together. Where the 3-inch stone is used, it has usually been found necessary to sprinkle over the surface after the first rolling a small quantity of 2-inch stone, and to roll this smaller size into the surface, which has the effect of pushing together the larger stones in the surface and keying them up tight so that after this rolling has been done, the surface presented is so compactly knit together that without the addition of any binder it is possible to haul a loaded wagon over the surface with but slight disturbance to the stone. When this condition is realized it seems that the ideal for a poured macadam has been reached. The upper course of stone now presents a surface which is sufficiently stable to carry the weight of the loads which will come upon it and it only remains to add to it something that will prevent the displacement of the stone.

It is estimated that this surface layer of stone will contain about 20 per cent of voids after the rolling. Theoretically all of these voids should be filled to prevent any displacement of the stone, which would require a little more than 2½ gallons per square yard of surface for a layer of 2½ inches thick. Practically, however, this may not be essential because the stones composing the surface have been so locked together that there is no opportunity for lateral movement of any stone unless some of them are first removed from the surface. It is the function of the bituminous compound to prevent that, and on the state experimental roads, 2 gallons per square yard has been the usual treatment. It will often be found that the surface of the road is so open that a smooth surface cannot be obtained without first filling the surface interstices and the chips are used for this purpose, being whipped into the interstices from the shovel. The surface is then broomed to sweep all chips into the voids leaving a clean surface. The voids are then poured practically full of the asphalt or tar binder.

Care in Selection and Application

In the use of bituminous compounds for this purpose, two facts must be taken into consideration. First, the material which is to be used for this purpose must be well chosen and must be appropriate to the conditions under which it will be applied. Second, the application must be made in such a way as to insure that the material will go on the surface in a uniform layer and that the surface will be in such a condition as to permit the material to flow into the inter-

---

Paper by T. R. Agg, Assistant Engineer, Illinois Highway Commission stices and to fill practically all of the voids in this upper lawer of stone which has been discussed.

If a tar is used as a binder, the following method of application has been found to be successful . The binder is received in tank car lots and is heated in the car by means of the steam coils provided in the cars for that purpose. In heating the tar, it is necessary that an ample supply of steam be provided and usually it has been secured from some power plant of large capacity. It is possible to heat the material in the tank car by this means to a temperature of 250 degrees Fahrenheit which is sufficient to make the tars used soft enough for their application. Undoubtedly the temperature at which the material is applied is of great importance, and the temperature which would be correct for one material will not be correct for another. The ideal condition to be reached is that the material shall be sufficiently fluid when it reaches the road to flow into the interstices before cooling. It must not remain as a mat on the top of the stone. In handling tars, the material is forced out of the tank car into a distributing wagon by means of steam pressure applied to the top of the car. Steam pressure has not been found to be altogether satisfactory on account of the water which condenses and remains in the car, but has been fairly so. However, if pressure may be furnished by means of compressed air from a portable compressor the method is entirely satisfactory. The material is then drawn to the road in the distributing wagon and attached to a steam roller and steam connection made from the roller to the top of the distributing wagon; the tar is then forced out of the distributing wagon through a hose and nozzle and is prayed by means of the nozzle on the stone. This method of distributing is very satisfactory, it being possible to apply either large or small quantities of the material in a very uniform layer to the stone. The only objectionable feature so far observed is the slight amount of water which condenses in the tank wagon. This water turns into steam as soon as the new batch of hot binder is turned into the wagon and may cause the binder to foam badly.

Petrolium Unsatisfactory

The same general method of application has been attempted with petroleum residuum compounds, but has not been found satisfactory because it is impossible to heat the binder sufficiently by means of the steam coil to make it flow through the hose. It cannot even be heated sufficiently to spread by means of hand spreading cans filled from the tank wagon. At the temperature to which the material can be heated by steam the method is not satisfactory because the material is not sufficiently fluid to flow into the interstices; the result is that there are patches on the surface of the road which are unsightly and make the surface uneven to an extent which is perceptible to those who traverse it. In general it is thought that asphaltic compounds should be applied to the road surface at a temperature not less than 400 degrees Fahrenheit, and in some cases the temperature would need to be considerably above that in order to get satisfactory results. The principle mentioned before applies in this case, in that the binder must be sufficently fluid to flow into the interstices of the stone before cooling. It must not, however, be heated to the flash point of the material if an open kettle is used. In using an asphaltic compound, the best results have been obtained when the material is heated in kettles, drawn off from these kettles into hand sprinkling cans and poured onto the surface of stone.

The first spreading of these compounds will leave the surface of the road slightly rough where individual stones project partly from the surface, owing to the fact that they have been disturbed by the men walking over the surface in spreading the chips and compound. By rolling this surface with a wet roller before a second spreading of asphalt is applied, this fault can be corrected. After the first spreading of bituminous compound, then the surface of the road should be rolled and then covered with stone chips, and thoroughly broomed so that these chips work into all of the interstices and voids that show up in the surface of the road. This is the most important operation aside from the pouring of the compound, but if it is carefully done an extremely uniform surface can be secured. After this spreading of chips has been carefully broomed, a second spreading of compound in the nature of a paint coat is applied to the surface. In this application not to exceed one-half gallon per square yard of surface should be used. In the first application the amount of compound must be determined by the nature of the surface layer of stone. Usually 1¼ to 1¾ gallons per square yard has been used in state work.

Experience with the use of various bituminous compounds in construction work led to the conclusion that there are some important variations in the characteristics of the commercial preparations sold for use in road construction. In the absence of accepted standard specifications for these compounds, no attempt was made to secure compounds meeting any certain specification except in a few instances, but all materials used in 1909 and 1910 were analyzed according to approved methods and a record made of the results. It is thought that a study of those analyses and a comparison of them with the behaviors of the compounds on the roads will give information that may eventually be incorporated in a set of specifications.

Summary of Results

Inspections were made in 1910 of roads built in 1909, and the condition of the various tars is sumarized as follows:

Sample 101 gave fair results as a binder, holding the surface of the road intact and forming a slight mat on the surface which plainly showed the print of the shoes of the horses. During the hot weather the material softened sufficiently to flow out of the macadam on the earth shoulder at the edge to some extent. The constant kneading of the mat surface seemed to deaden the material so that it began in places to separate from the stone and to become brittle. So far the wear is almost entirely on the mat of tar on the surface of the macadam.

Sample 103. The same general conditions were found as where the No. 101 was used except to a slightly less degree, with the probability that the life of this material will be somewhat longer than that of No. 101.

Sample 104. This material seemed to work out on the surface to an undesirable extent and became quite soft during hot weather, running out onto the earth shoulders in large quantities. The mat on the surface is dead and brittle and is peeling off from the stone. This seems to be the poorest tar used during the season. So far the mat of tar is taking all the wear.

Sample 10[illegible] The tar was used on a road [illegible] ed that large quantities of mud were carried onto it during the winter. The tar now appears to be dead and somewhat brittle and does not seem to have held the chips in the interstices of the upper layer of stone. The surface of the road is rough, the wear all coming on the stone.

Sample 106. No report received.

Sample 107. This material has held its life well on a very heavily traveled road. On about 60 per cent. of the surface, the tar has worn off entirely, the surface presenting a mosaic appearance, each stone being surrounded by the tar, the stone forming the wearing surface. On the remainder of the surface, the tar forms a thin mat over the stone and is taking the wear and protecting the stone. This tar is apparently the best one used during the season.

Sample 108. This tar was used in resurfacing work where a considerable quantity of stone dust and mud was found on the road. The tar became brittle and wore off the surface. There has been no loosening of the stone. It is thought that the poor results were due in part to the fact that the tar was applied in cold weather.

Sample 109. About the same results were obtained with this material as with No. 105, it being used under similar conditions.

Sample 110. This material was used under conditions similar to those where Nos. 105 and 109 were used. The results were better, however, the surface being fairly smooth. The chips hold in place in the interstices of the surface. The stone is taking the wear and the surface presents a mosaic appearance.

Samples 111 and 112. With these materials the stone is held in place but the wear is on the stone. The tars here become slightly brittle during cold weather, but in warm weather seem to regain their life. They did not soften enough to flow.

Sample 113. This tar became brittle and the surface of the road cracked up under traffic, due, it is believed, to the fact that the tar was applied during cold weather, and that the road was not in proper condition for receiving the tar treatment.

In general, it may be said that all the roads were dusty except those that had an excessive mat of tar on the surface, and these were comparatively free from dust. This mat, however, is probably short lived and the conclusion is that all tar treated roads will become dusty within two or three years after construction, and that if the mat surface is not obtained, the roads will be dusty from completion. It may also be said that the surface layer of stone, in all cases, is held firmly in place, but that the finer particles in the interstices are not held in place by brittle tars. It is probable that when the mat surface wears off one of these roads, it can be replaced by applying a proper grade of tar in the nature of a paint coat and that this will be the cheapest method of maintaining roads of this character.

Quality of Tars not the Best

It seems that some change must be made in the character of the tars available for construction purposes, to insure that they will not soften and flow in hot weather and not get brittle during cold weather. Just how this can be done is not at once apparent, but it is probable that volatile light oils should be eliminated and the free carbon held as low as possible. There should then be a sufficient quantity of dead oils present to give elasticity to the pitch.

The oiled earth construction was undertaken with the object of determining the durability of this form of construction under the soil and climatic conditions encountered in Illinois. It was desired to accomplish something more than a surface treatment which would merely serve to alleviate the present dusty condition of roads during dry weather and possibly reduce the cost of maintenance on a country road. In order to accomplish these purposes, it was thought necessary to incorporate into the surface layer of earth on the road a sufficient quantity of an asphaltic oil to render this surface layer impervious to water. In accomplishing that purpose, it seems possible that such a large quantity of oil will need to be used that in the hot weather, the oil will soften up sufficiently to make the surface layer of the road plastic. If such is to be found the case to any extent, it is at once apparent that the slight depression which is formed by the wheels will hold water and will soften and eventually cut through; but it seems also probable that if the surface becomes sufficiently plastic to be put out of shape by means of the traffic, it will also be sufficiently plastic to be readily put back into condition, and it is probable that on such a road the surface can be reshaped about once a year and it is believed that if this is done, the road will not get muddy to any extent during the winter. It is possible then that the road may be well worth its cost, but until more experience has been had with this class of construction, no definite answer can be made on that point.

Ivesdale Road

Section I of this road in Bement township, Platt county, was constructed in 1908. This oiled earth road was constructed on a black gumbo soil by mixing with the upper layer of the road an asphaltic oil in such an amount as to give a layer about five inches thick which was treated with oil in as large a quantity as it would absorb. In general, the method of construction was as follows:

The centre of the road for a width of about 15 feet was plowed up, disked, and pulverized as fine as possible. The pulverized earth was then removed to the side of the road and the middle portion of road bed, on which the oil was to be used, was shaped and thoroughly compacted with a 10-ton steam roller. Alternate layers of oil and earth were then placed on this foundation, thoroughly mixed with a disc harrow, and rolled. The road was finished by putting on a light layer of earth and rolling the surface.

In the construction numerous difficulties were encountered, particularly in getting proper mixtures of the earth and oil. This mixture when once made was of such a gummy nature that it was almost impossible to get it evenly distributed over the surface of the road. Also the nature of the soil was such that it could not be entirely reduced to dust and there were numerous large clods in the mixture which were not broken up in any of the operations and remained in the surface of the road after its completion. It was found that the oil never impregnated these larger pieces of earth at all.

Subsequent work on this road showed that the earth and oil mix more uniformly if the earth is moistened with water during the mixing process. At first the road is very soft but as the water dries out the oil apparently takes its place and the surface becomes harder. During this time the road should be rolled and kept smooth.

Conclusions

Conclusions. The experiments have conclusively shown that a poured macadam is a desirable roadway. It has an elastic surface pleasant to travel which is much less dusty than the untreated macadam. While the roads built have not been in service long enough to give accurate data on the life of the macadam, still it is apparent that for some years the wear will be entirely on the bituminous compound if a proper one is used. In general we may safely state that the life of the road is greatly lengthened especially if the road has a mixed traffic with a considerable amount of one horse and automatic traffic.

Oil earth construction must be considered as of doubtful value so far as the experiments already made may be interpreted and while there can be no question but that the roads were greatly benefited still it remains to be proven that the treatment is worth the 30 cents per square yard it costs.

As to the relative cost of the waterbound and bituminous macadam, the tar macadam will cost 15 cents per square yard more than the waterbound at the present cost of tar, and the asphaltic macadam will cost from 15 cents to 20 cents per square yard more than the waterbound, depending upon the price paid for asphalt.

In regard to the relative cost of maintenance, no data can be given because none of the bituminous roads have been in service long enough to determine this point. It seems probable, however, that a bituminous macadam will maintain its surface at least as long as a waterbound macadam and probably much longer. When necessary it can be repaired by a surface dressing or paint coat of the proper grade of binder at a cost of about 15 cents per square yard of surface. To properly resurface a waterbound macadam road would cost 30 cents per square yard, so that the maintenance of the bituminous road is probably longer for the macadam and the road itself more desirable.

Need of Standard Specifications

The committee composed of Prof. A. Marston, Seth Dean and W. B. Warrington, appointed by the Iowa State Drainage Association to look into the matter of Standard Specifications, opened the report with the following interesting statements:

"A very serious situation has developed in Iowa during the past season in connection with the construction of large tile drains. An especially disastrous failure of large drain tile occurred in Sac county, Iowa, under the load of earth filling in the ditch, the damage running up to several thousands of dollars. Following this failure, intelligent and reliable experts have made examinations of a number of large tile drains in the northern part of the state, and they report that many of the pipe in such drains are found cracked when the depth of earth filling exceeds five to eight feet. The above is true both of cement and clay drains. We also have reports from time to time of cracked pipe found in examinations of city sewers.

Great Need for Standard Specifications

"It appears, therefore, that at present many large tile drains have been built of material not sufficiently strong to stand the loads which come upon them in the ditches. When we understand that Iowa has already completed within the last few years, or put under way, $17,000,000 worth of drainage work in thirty-one counties in the northern jart of the state, and when we further realize that the construction of large tile drains in preference to open ditches is constantly growing in favor, and that hundreds of thousands of dollars worth of such work will undoubtedly be under way the present season, then it may be readily understood that some immediate remedy for a possible disastrous state of affairs must be found.

"Up to the present, drainage engineers have had no standard method of making tests of the strength of drain tile, nor have they had at hand any data on the strength actually developed by tile which are considered to be of fair quality. Hence, it is impracticable for drainage engineers to prepare proper specifications which will insure satisfactorily strong tile, and equally impracticable for the manufacturers of tile to be certain that the product will stand the actual conditions of use. It is absolutely essential, therefore, that specifications for standard methods of making tests should be adopted at once, to govern in Iowa during the coming construction season, even if later it becomes necessary to revise the specifications. In fact such revision, should it prove necessary later, will be no more serious than the revision which has just been made of the standard specifications.

Glass in Canada

Mr. J. F. W. Thomson, St. Nicholas street, Montreal, who deals extensively in imported glass, marble and metals, interviewed by the representative of Contract Record on the glass situation in Canada stated that there has been no appreciable change in the quotations in recent years with regard to window glass and even less in connection with plate glass. The standard price list for window glass that exists to-day was established in 1874. The variations from this standard are indicated by discounts and the fluctuations in recent years are fairly represented by the following figures: The discount this year is 64 per cent. In 1909 it was 67 per cent. In 1906 it was 65 per cent. and in 1894 it was 81 per cent. This shows plainly that the present prices are not the lowest ever experienced in this country. Mr. Thomson is in close touch with the Belgium market as well as familiar with conditions in the Canadian field. The glass market for Belgium is at Charleroi where open market is held every week. Large glass dealers may have branches in various parts of Europe or elsewhere, but practically all important companies have their head offices there.

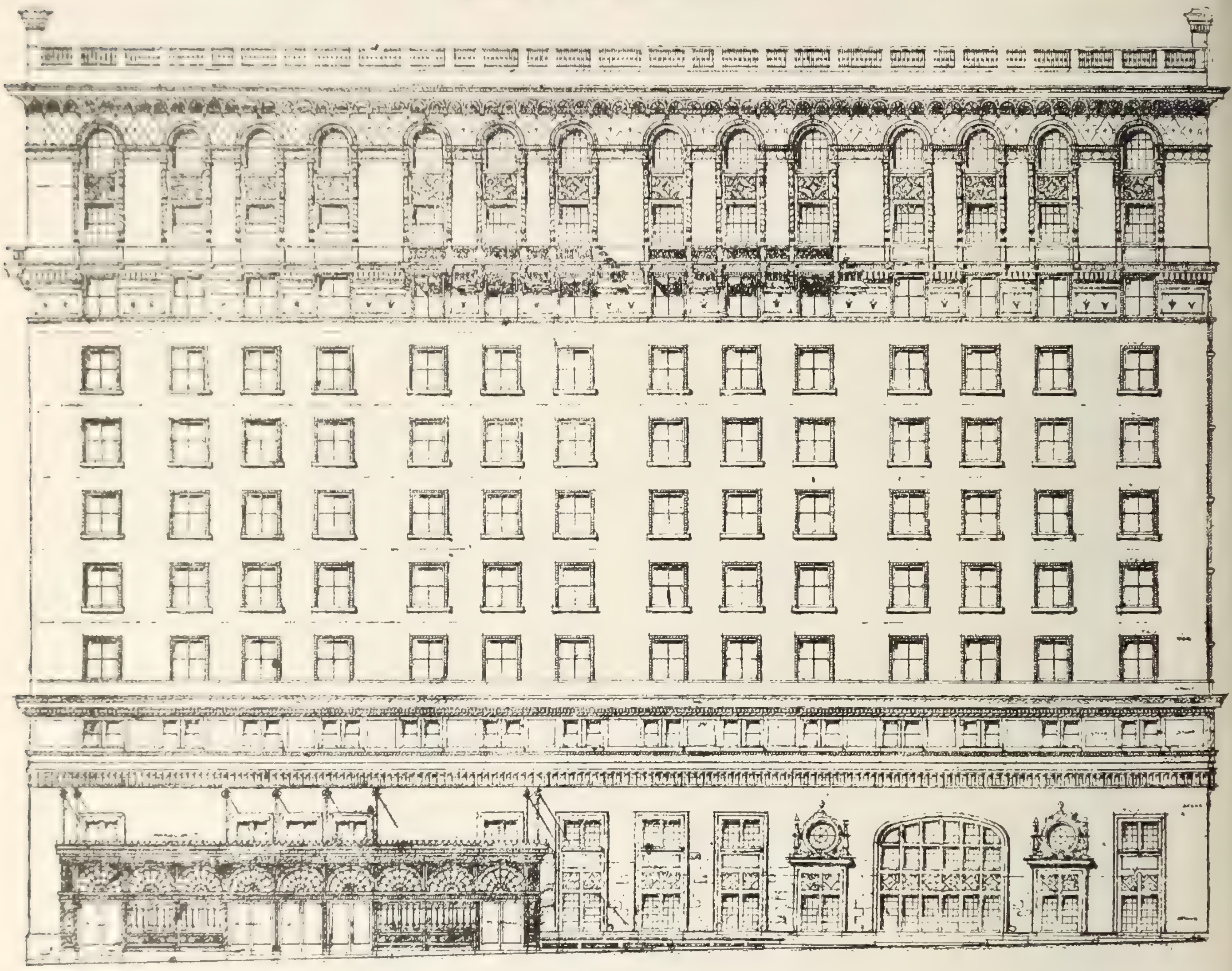
Belgium has the world for its market, and Mr. Thomson accounts for the steady prices that have been maintained by the fact that when there is a brisk demand in one country there is liable to be a dullness in other parts of the world. Canada last year bought freely and did not get rid of the heavy stock on hand. This year so far the market has been very dull and any possible change in quotations will depend largely on how stocks are cleared up within the next two or three months. Mr. Thomson believes that a firm giving a large order would obtain the same quotations this year as last.

As to the existence of a combine and any effect the combine might have on Canadian prices Mr. Thomson declares that there is none. There is a sort of understanding or agreement supposed to be in force, but it is so little observed as to be worthless. The agreement, like the commodity dealt with, is very easily broken and when it suits them dealers show no hesitancy in making holes in it.

Building Operations in Montreal

The New Ritz-Carlton Hotel—Harbour Commissioners' Elevator — Post Office Improvements

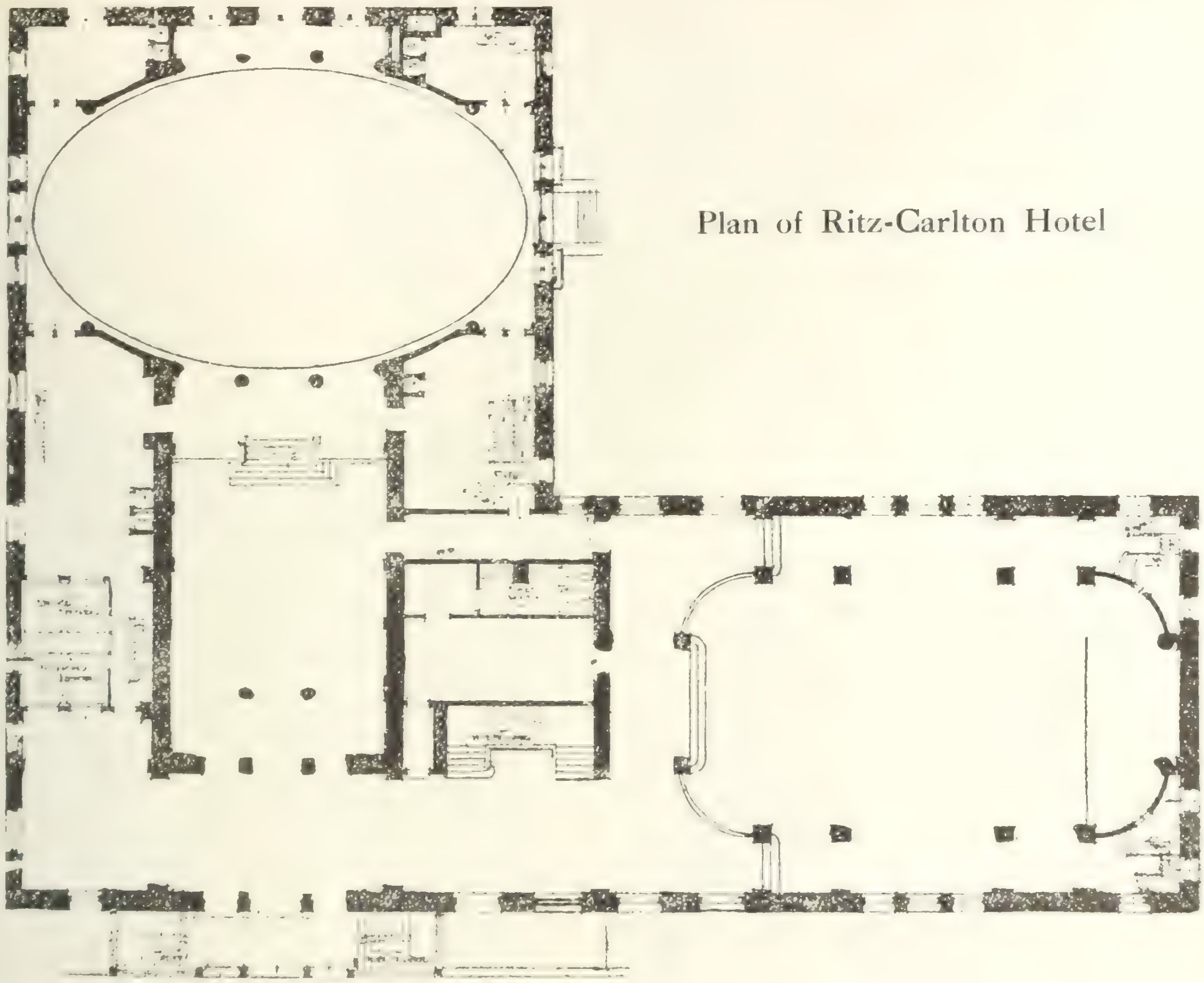
Special to the Contract Record.



The plans for the Ritz-Carlton hotel to be erected on Sherbrooke street at the head of Drummond street are well advanced and a large part of the excavation work has been done by The George A. Fuller Company, Limited, who are the contractors for the foundation work. The contract for the steel work has been awarded to The Dominion Bridge Company and this portion of the structure is to be in place by the middle of November. Tenders have just been received for the general construction, but the contractors will not be announced for a couple of weeks. The architects are Messrs. Warren & Wetmore, East 33rd street, New York. The building is being erected for the Hon. Lionel G. Guest of Montreal.

The Ritz-Carlton Hotel will have a frontage of 187 feet on Sherbrooke street and 142 feet on Drummond street, and will be ten storeys high. The Sherbrooke street entrance will be covered by a large vestibule. On the left of the entrance lobby will be the office and elevator hall; on the right the reception lobby and staircase leading to the ball room. Facing the entrance lobby will be the palm garden 34 feet by 59 feet leading by a low flight of steps to a terrace at the entrance of the restaurant. The restaurant will be an oval shaped room devoid of all columns and will be fifty by eighty feet. It will be situated at the north end of the Drummond street front. The ceiling of this room will be oval and the treatment of the decorations will be of the Adams period.

The palm garden will be a very attractive feature of the hotel, with tiled floors and a scheme of decoration arranged in lattice work similar to a conservatory. Two flights of stairs in the vestibule will be 46½ feet by 56 feet and will accommodate about 150 guests. It will be panelled in oak, the general decoration being English in treatment. The kitchen will be on the basement level and situated immediately under the restaurant. The kitchen will be lighted by windows on Sherbrooke sereet and the lane in the rear of the building. Under the kitchen in the sub-basement will be the kitchen preparing rooms,



Plan of Ritz-Carlton Hotel

the boiler and pump rooms, baggage rooms and the elevator and refrigerator plants. On the first floor in addition to accommodation for a large part of the hotel staff, there will be a series of dressing rooms for the use of guests arriving by morning trains and leaving again in the evening and who do not wish to take bedrooms. The barber shop and ladies' hair dressing parlors will be on this floor. The second floor is provided with several suites of rooms and two large private dining rooms. The bedrooms are nearly all 14½ feet by 18 feet. Each bedroom is provided with a private bath. Many of the bedrooms and all sitting rooms will be provided with fire places.

The ball room will be on the Sherbrooke street front at the westerly end of the building and will be 58 feet by 89 feet. A moveable stage will be provided at the westerly end of the ball room which will be available for concerts, threatricals, banquets, balls and other large entertainments. A gallery of boxes will overlook the ball room. The floor will be of polished hardwood. A pipe organ will also be installed in connection with this room. The floors throughout the building apart from the ball room, will be of cement, only a narrow strip of wood being let in the floors for the securing of the carpets. At the end of each corridor will be a staircase leading from the top to the bottom of the house, closed in with fireproof material. In the centre of the building will be another fireproof shaft. The whole building will be of the best fireproof construction. The arrangement of the building will be such as to provide an unusual amount of natural light; the most modern system of ventilation will also be installed.

Montreal's New Elevator

Splendid progress has been made in the construction of the Montreal Harbor Commissioners' elevator No. 2, situated on the harbor front between the Jacques Cartier and Tarte piers. In this mammoth elevator there are 246 bins with an aggregate capacity of 1,772,000 bushels of grain. The height of these bins is 86 feet over foundation work, 27 feet deep, making a structure at the present time a huge mass of concrete 113 feet in height with a ground area of 313 feet by 100 feet. In its construction 10,000 cubic yards of concrete were put into the foundations; 5,400 cubic yards in the columns and bin girders and 12,600 cubic yards in the bin walls, making altogether 28,000 cubic yards of cement work. There remains to be erected a concrete cupola to a height of 102 feet above the present structure, making a total height for this elevator of 215 feet.

Considerable time was taken in getting in good solid foundations, but the storage bins have been constructed in remarkably quick time. They were put up in two sections, the whole taking only 38 days and the second half only 14 days. 700 men were employed on the task working day and night in shifts of 11 hours each. In addition to the large amount of concrete used [illegible] bars of reinforcing steel were employed. The elevating and weighing machinery will be in the copula and it will take probably all of the summer season to complete the construction and installation. Several new features will be incorporated in the arrangement of the superstructure. This elevator is being built by The John S. Metcalfe Company, Limited.

General Post Office Improvements

The work of demolishing the old General Post Office building on St. James Street, Montreal, is progressing rapidly and very shortly there will arise on the site a new fireproof structure of pleasing design. The architect is Mr. Theo. Daoust. The foundation will be of concrete. The frame work will be of steel, the walls and floors of terra cotta and tile and the front of Montreal limestone ornamented with stone figures. The front steps will be of granite and the stairways of iron. This part of the building will be served by two elevators. The section of the post office fronting on Craig street, which was built last year, also has two elevators and is fireproof throughout. The new structure will have a frontage of 117 feet on St. James street by a depth of 90 feet on St. Francois Xavier Street. There will be but one basement and the front of the building will rise to a height of 100 feet above the sidewalk. The general contractor is Mr. Joseph Bourque; the steel work will be furnished and placed by the Dominion Bridge Company. The ventilating system will be the Buffalo Forge.

Mr. Carr Lane Glasgow, who has been appointed Montreal District Sales Manager of Allis-Chalmers Bullock, Limited, has had extensive experience in the construction of electric railways and the design of electric power plants. After leaving college he was in the employ of the well-known engineering and contracting firm, Westinghouse, Church, Kerr and Company for five years and was one of the engineers in connection with the construction of the Lackawanna and Wyoming Valley Electric Railway and the Grand Rapids, Grand Haven and Muskegon Electric Railway and the electrification of the Long Island Railway. Later he was engaged in the electrification of the West Jersey and Sea Shore Railway and also with the Northern Colorado Power Company. Mr. Glasgow is a graduate of the Cornell University in Mechanical Engineering.

Difficult Problem Solved

Ingenious Device for Regulating the Injection of Chloride of Lime into the Water Under Pressure.

This problem which has confronted the authorities of the city of Toronto for some little time, and which almost led them to adopt a scheme at a cost of $1,000 by a Philadelphia expert, has been solved in the following manner:

The disinfecting solution is led by gravity to a small pump directly connected to the rocker arm of the pumping machine. The diameter of this pump and the length of its stroke bears such a relation to that of the large pump as to suit its capacity, so that a constant and accurate supply of the disinfectant is insured at all times.

The solution enters the discharge pipe clear of the pump, doing away with any liability of injurious effect upon cylinder of piston. It enters the discharge pipe as a spray through a series of fine nozzles which thoroughly mix it with water from the outlet valve of the large pump. This thorough mixing constitutes a very important feature, and, owing to the pressure of the contained water, had been for some time a subject of very careful consideration. An idea of the mixture used may be formed from the following: Some twelve pounds of chloride of lime are first dissolved in forty gallons of water. One gallon of this is applied to thirty gallons of water, forming a solution ready for the pump. The proper proportion of solution to water to be disinfected may then be computed by comparing the stroke displacement of the two pumps. This device is the invention of Mr. Fred Henning, chief engineer of the Toronto Filtration Plant. It has been installed upon all the city pumps at the Island, and was duplicated a few days ago at the pumping station in West Toronto. The appliance costs $25 and may be applied in a couple of days. One of these has been in operation for some time and has not given the least trouble.

A. L. Young, vice-president of the Aikenhead Hardware Company, Limited, Toronto, with whom he has been associated since 1882, is severing his connection with that firm to become Canadian manager for Messrs. Henry Hope & Sons, Limited, of Birmingham, Eng., the well known makers of steel casements, steel factory sash, roof glazing, etc. Mr. Young has taken a prominent part in the builders' hardware business in this city and the fact that in his new field he will still have headquarters in the city is much appreciated. Mr. Young is at present looking over sites prior to erecting a factory for the manufacture of steel factory sash and roof glazing. The building will be 80 feet by 250 feet in plan.

Building Up Cement Piles in Quicksand

A novel method of building up cement piles or supports in quicksand is the subject of a German patent. A pipe of suitable size has at its lower end an auger point and a helical screw blade, several holes being driven through the wall of the pipe just above the blade to permit the discharge of cement grout outward. By water pumped through the pipe, the apparatus is twisted into the sand, jets being used to aid the sinking if necessary. When the required depth has been reached, the grout it pumped into the pipe and the drill is turned backward to withdraw it. Flowing out along the face of the blade, the cement becomes mingled with the sand directly above, and the twining screw passes the mixture to the space below. A cylindrical pile is thus built up in the semi-liquid sand. Others may be produced in the same way alongside the first and these may be readily consolidated into very strong and substantial piers.

Prominent Contractors

Mr. J. P. Mullarkey, Montreal

Mr. J. P. Mullarkey, railway contractor, of Montreal, is one of the best known and most successful contractors in the province of Quebec. His long and varied experience as organizer, operator, and construction administrator in both electrical and steam railway work has made for him a reputation in the Canadian railway world that anyone might be proud of with the result that, with the passing years larger and more important contracts have been committed to his executive charge. Quite recently he was awarded the general contract for two important sections of the Canadian Northern Ontario Railway, the one being the line from Sydenham to Ottawa and the other from Hawkesbury, Ont., to Montreal, Que. In Quebec also Mr. Mullarkey was recently placed under contract to build the Quebec and Lake St. John extension.

Mr. J. P. Mullarkey, Montreal

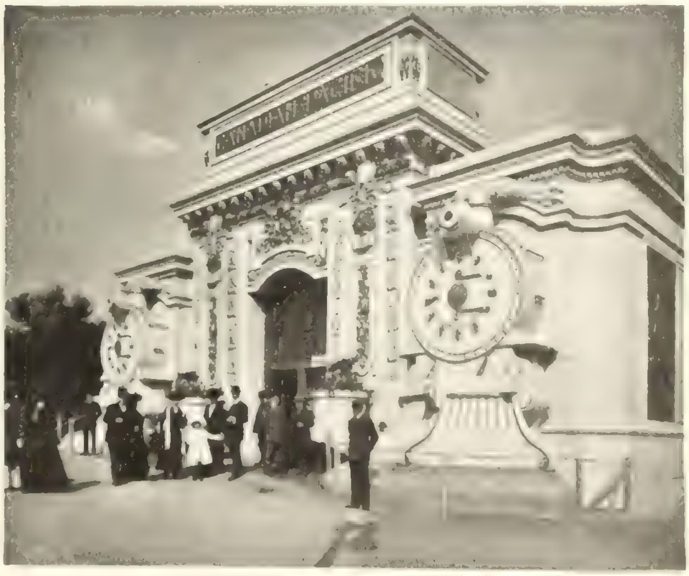
Mr. Mullarkey was born in the province of Quebec, and after receiving a good general education and business training, he entered the employ of Mr. H. J. Beamer, who was at the time engaged in the construction of the line between Pontiac and Pacific, and, shortly after, the Ottawa and Gatineau line, now belonging to the C. P. R. Followng this the Montreal and Western line, which is now part of the Ste. Agathe branch of the C. P. R., and the line beween Quebec and Ste. Anne's, were built.

On leaving Mr. Beamer in 1896, Mr. Mullarkey underook the promotion and construction of the Montreal Terminal Railway. The object of this system was to furnish the citizens of Montreal with a rival service to the Montreal Street Railway. Mr. Mullarkey and his associates succeeded n establishing a very useful service covering a considerable mileage through a district where such service was in demand, but the city council of the day proved to be largely antagonistic to the enterprise and the promotors found their way hedged about in all directions. The Montreal Street Railway had priority rights over available streets shutting out the Terminal line from extending their service to parts of the city which would have made the proposition a paying venture. Finding in the end that competition was not going to be encouraged by the civic authorities and that their money could be invested in other enterprises of a more promising character, the directors of the Terminal decided to sell and a satisfactory offer from the Montreal Street Railway Company being made it was accepted, upon which the Terminal became an integral part of the Montreal Street Railway system, and it is operated as such at the present time.

Mr. Mullarkey next undertook the construction of the Chateauguay & Northern Railway between Montreal and Joliette, including the large bridge at Bout de l'Isle, which is now a part of the C. P. R. Mr. Mullarkey also built the line between Garneau Junction and Quebec City, also that between Pierreville and Lotbiniere, an extension of the Quebec and the Montreal & Southern Railway, owned by the Delaware and Hudson Railway Company.

C.P.R. Building, Glasgow Exhibition

The Canadian Pacific Railway building in the Glasgow Exhibition at the Crystal Palace is of quite a novel and attractive design. The front shows the forward parts of two mammoth C. P. R. locomotives embedded in the walls, one on either side of the portal. This work is done in plaster of Paris. The decorative features of the interior includes a series of paintings depicting important events in Canadian history. There is a picture for each province and several others representative of the chief industries and interests of Canada as a whole. The exhibit illustrates numerous phases of life and work in the Dominion. Many of the photographs and other pictures depict natural scenery along the lines of the C. P. R. and elsewhere. The cost of the building was in the neighborhood of $20,000.



The Goodyear Tire & Rubber Company of Canada, Limited, has recently received a large rubber conveyor belt contract from the Jencks Machine Company, of Sherbrooke, Quebec, also a contract for the entire season's requirements of belting, hose and packing for the Dominion Canners, Limited. The company have found it necessary to increase the size of their plant, and the contracts are being let for the buildings, machinery, etc.

Trade News and Notes of Interest

Calgary is to have a new water supply with three times the volume of the present service. Surveys have been ordered and will be made at once.

Work on the C. P. R. high level bridge at Edmonton is progressing rapidly. The concrete work will be completed in a few weeks and will be ready for the steel.

[illegible] A. Stiles, B.A.Sc., Toronto, is resigning his position as demonstrator at the University of Toronto, to accept a professorship in the University of New Brunswick.

By-laws authorizing the expenditure of over $54,000 for waterworks and sewer extensions, and local improvements, were passed by a big majority by recent vote of Red Deer.

The contract for a new factory building at Windsor has been awarded to Delisle, Culbertson Winchester Company. The building, 90 by 140 feet, will be of reinforced concrete.

The Massey-Harris Company have their new storehouse and offices at Edmonton, Alta., well under way. The building is to cost $25,000 and is being constructed by day labor work.

The firm of Mitchell, Jones & Company, of Calgary, contractors, have been awarded the contract for 12,000 linear feet of trunk sewers in that city. The amount of their bid was $172,654.

City Engineer Rust estimates that it will cost $25,000 annually for five years to construct the necessary bridges, driveway and trespass-proof fence on the Humber park driveway, proposed for this city.

The Steel Company of Canada, at Mimico, were granted permission to construct a siding from the Belt Line across Windermere avenue to their property, between the Lake Shore road and Queen street.

Woods & Company, of St. John, N.B., have been awarded the contract for the construction of a new station for the Intercolonial Railway at Campbellton, N.B., replacing the one destroyed by fire last year.

Mr. Samuel J. Fox, M.P.P., of Lindsay, a Canadian authority on brick manufacturing, died on July 3rd after a long illness. Mr. Fox is a past president of the Canadian Clay Products Manufacturers' Association.

A new intercepting sewer for Saskatoon, which is to cost some $300,000, is well under way. The Lock Joint Pipe Company, of New York, have the contract for the piping. The McGoogan Company, of Port Arthur, are doing the excavating.

Work has been begun on the rebuilding and enlarging of the bakery of Messrs. James Strachan, Limited, of Montreal. The new structure will be absolutely fireproof and the improvement will cost $25,000. Peter Lyall & Sons have the contract.

The same company is carrying on dock improvements at Port Arthur for the Canadian Northern Railway. This work includes concrete coal shipping pockets, sheds and foundations. The coal handling machinery will be operated by electric power furnished by the Kaministiquia Power Company.

Construction work on the new Parliament Buildings at Edmonton, Alta., is being rushed with all possible speed. The total cost of the work will be in the neighborhood of $2,500,000. The work will be continued throughout the winter. Since the opening of the building season 200 men have been continuously employed.

The Quebec & Saguenay Railway Company is constructing a single track steam line 56 miles in length from Cape Tourmente to Murray Bay. The contract for the entire work has been let to Mr. M. J. O'Brien, railway contractor, of Renfrew. At the present time in the neighborhood of 2,400 men are employed on the work.

In connection with the extension of the C. P. R. Windsor Station, Montreal, an artesian well is being sunk. The depth reached at last report was 860 feet, when a flow of 1,200 gals. per hour was obtained. As it is desired that a flow of 4,000 gallons an hour should be furnished by this well the intention is to go down to a depth of 1,000 or 1,500 feet if necessary. The Wallace Bell Company, Limited, are the contractors.

What is stated to be the largest contract ever let in Canada constitutes an outlay of $10,000,000, and involves the building of 160 miles of grade for the Canadian Northern through the heart of the Rockies. The steel will run through the valleys of the Fraser and the South Thompson rivers. The contracting firms are the Northern Construction Company, and P. Welsh, of Spokane.

Messrs. Barnett McQueen & Company, Limited, have erected a mill and elevator at Sudbury for the Ontario and Manitoba Flour Mills Company, of Ottawa. This building was commenced in August and was ready for the machinery in March. The mill machinery for this also is being supplied by the Allis-Chalmers Company. The power will be hydro-electric and will be brought a distance of fifteen miles. The motor was furnished by Mr. A. C. Bullock, of Montreal.

The plans for the enlargement of the C. P. R. station at Calgary provide for the extension of the present building, a distance of 300 feet to the west and 65 feet to the east. The west wing will be extended to within 40 feet of the new hotel which will front on Ninth avenue. This wing will accommodate the ticket office, the express office, including express parcel room, a dining room and restaurant. The whole of the present building will be turned into a commodious waiting room. The east wing will be extended to a point close to the new Irrigation Building. This building will be occupied by the telegraph offices. Tenders for the work will be called for in a few days.

The Barnett, McQueen Company, Limited, of Fort William, have just completed and delivered over to the St. Lawrence Flour Mills Company, Limited, the latter's new mill at 1110 Notre Dame street west. The work was in charge of Mr. E. D. Casseday, chief engineer, and D. J. McKinnon. This mill has a capacity of 3,000 barrels per day. The construction work was commenced on first of September, 1910, and was practically completed on May 1st. The electrical installation was then commenced and was completed in a little over a month. The Canadian Westinghouse Company supplied the motors and transformers. Electrical energy is being supplied by the Montreal Light, Heat & Power Company. The mill machinery was put in by Messrs. Allis-Chalmers, of Milwaukee.

A marked improvement in the general tone of industry and a corresponding increase in activity of general labor is reported in the June Labor Gazette. Weather conditions have brought along crops rapidly, and the agricultural outlook is excellent. On the commercial life of the community the effect has been felt at the close of the month in an increasing buoyancy of orders. The outlook in the manufacturing industry has also been affected in a similar degree. The feature of the month was the rapid absorption of the supply of general labor in view of extensive railway construction, building and civic improvement work that has been planned for the present summer season, the outlook being on June 1 that in each of these branches the year will see an exceptionally large amount of work completed.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brandon, Man.

Petition granted for granolithic sidewalks and electric light standards. Owner, City of Brandon. city engineer, R. E. Speakman. Wider granolithic sidewalks and standard electric light; additional sidewalk amounts to about one-half mile by 3 feet. Purchase of electric lighting, 5-globe standards, $15,000.

Engineer's report. Proposed addition to sewers, Rosser avenue. City Engineer, R. E. Speakman. Cost of laying 24-in. pipe on Rosser the distance required, $7,500; enlarging sewers in 11th 10th, 9th and 8th streets, etc., about $3,000. The plan decided upon by the council will be the enlargement of the laterals on the four streets mentioned. Copy of engineer's report to be had on application to the office of MacLean Daily Reports, Limited, Toronto.

Brantford, Ont.

Tenders called for bridge (2 miles from Burford on town line). Owner, County of Brant. Chairman Co. and Road and Bridge Commission, Wm. Milmine, Brantford. Reinforced concrete, 1 span 75 ft. Plans, etc. at office of Co. Clerk. Tenders received until noon July 15th.

Burnaby, B.C.

Tenders called for waterworks. Owner, Corporation of Burnbay. City clerk, W. Griffiths. Engineer, Cleveland & Cameron, Winch Bldg., Vancouver. Special castings for waterworks supply. Plans, etc. at office of engineers. Tenders received until 5 p.m. July 24th. Tenders also called by engineers until July 24th, for sluice and special valves.

Cornwall, Ont.

By-laws to be submitted for waterworks. Owner, Corporation of Cornwall. Town Clerk, George S. Tarvis, Cornwall. To raise $30,000 for the laying of additional pipe line for waterworks. Vote will be taken on July 28th.

Chatham, Ont.

Tenders called for Tp. of Raleigh and Government Drain No. 2. Owner, County council. Engineer, W. G. McGeorge, Chatham. Spans 30 ft. each, concrete and steel foundation. Plans, etc. obtained from engineer. Tenders received by engineer until July 8th.

Tenders called for sidewalk. (S. S. No. 4, North on Lot, Con. 5, Raleigh). Sec., W. J. Shreve, Chatham. Supply of material and construction for concrete foundation and sidewalk from S. S. No. 4 N. con. 5, Raleigh. Specifications at residence of undersigned, Lot 7, Con. Raleigh. Tenders close July 8; work to be completed Sept. 1st.

Dundas, Ont.

Dredging (Desjardins Canal). Owner, Board of Works, Dundas; engineer, J. J. Armour, Dundas, Ont. Successful contractor, J. E. Russell, 307 Logan avenue, Toronto. Removal of 27,500 cu. yds. of materials, work to be done in accordance with the Jennings award. Equipment required, dredgers.

Drayton, Ont.

Tenders called for bridges. Owner, Wellington County, Ont. Warden, M. Fox, Drayton. Engineers, Bowman & Connor, 36 Toronto street, Toronto. Construction of one Douglas forty-foot concrete arch bridge and breakwater, 10 feet high, 200 feet long, near Glen Allan. Tenders received until 2 p.m. July 21st, by M .Fox. For further information apply to engineers or to J. A. Wilkinson, Morriston, Ont. Advertisement in "Tenders and For Sale Department" of this issue.

Lethbridge, Alta.

Railway. Sir Wm. Whyte, Vice- pres. of C. P. R., states that work on the new Lethbridge-Weyburn line may be commenced this season.

Moose Jaw, Sask.

Proceedings of council, survey for pipe line. City Engineer, J. M. Wilson. City Engineer authorized to survey for a pipe line to Sandy Creek and estimate cost. Contract recommended for acceptance, Patrick Kilenny, South Hill trunk sewer at $37,653; Prairie Construction Co., South Hill sewer and water system at $30,770; National Iron Works Co., iron pipe at a cost of $39 per ton and special at $65 a ton; Whitlock & Marlatt's sewer pipe at $18,783.90.

North Bay, Ont.

Tenders to be called for supply of cast iron pipe. Owner, Town of North Bay, Ont.; engineer, J. Sinton, North Bay; commissioner of works, T. N. Colgan, North Bay. Special castings, headers, etc., 15,550 feet 14-in.; 2,550 ft. 10-in.; 27,745 ft. 6-in.; 1,100 ft. 4-in. c. i. pipe. Tenders called by July 20th received by commissioner.

Sanitary sewers. Engineer, J. Sinton, North Bay; contractor, Stewart & Co., Port Arthur, Ont. 6,470 ft. 10-in. pipe; 1,332 ft. 20-in. pipe; 2,873 ft. 24-in. pipe; 1,985 ft. 30-in. pipe; 1,700 ft. 36-in. pipe. Contract includes everything but supplying of pipe. Engineer's estimate, $15,000. Work to be completed November 1st, 1911.

Niagara Falls, Ont.

Contemplated new bridge. Owner International Railway Co. Steel arch. The rumor is persistent regarding the unsafeness of the bridge between Niagara Falls, Ont., and Niagara Falls, N. Y. Municipal authorities may ask International Waterways Board to investigate.

By-law to be submitted for sewers, $60,000. Owner, Corporation of Niagara Falls; clerk, W. J. Seymour, Niagara Falls; engineer, J. C. Gardner, Niagara Falls. On July 24, the ratepayers will vote on a by-law to raise $60,000 to convert Muddy Run Creek into a sewer.

Nanaimo, B. C.

Tenders called for paving. Owners, Corporation of Nanaimo. City Engineer, Allan Waters. Laying 14,450 superficial yds. of asphalt, or other approved paving. Plans at office of city engineer. Tenders called until 21st July, by engineer. Advertisement in "Tenders and For Sale Department" of this issue.

New Westminster, B. C.

Tenders to be called for sewer pipe. Owner, City of New Westminster, B. C. Engineer, J. W. Blackman, City Hall New Westminster. Supply of 18-in. 122-in. 10-in. 8-in. and 6-in. vitrified pipe; length, 10¾ miles approximately. Supplementary report later.

Tenders called for sewer pipe (West end). Owner, City of New Westminster, B. C. City clerk, W. A. Duncan. Engineer, J. W. Blackman, City Hall, New Westminster. Supply of 4-in., 6-in, 8-in., 10-in., 12-in., 15-in. and 18-in. vitrified pipe with necessary bands, Y's etc. Tenders received until July 10th.

Ottawa, Ont.

Tenders to be called for paving. Owner, Corporation of Ottawa; city engineer, N. J. Ker, Ottawa. Tenders will be called about last of July for asphalt paving of a number of streets. Petitions coming in.

Scarboro Township, Ont.

Tenders called for bridge, $10,000, over Rouge river. Owner, Co. of York. Co. engineer, F. Barber, 57 Adelaide street E., Toronto. Concrete abutments and a concrete truss bridge. Plans, etc. at office of engineer. Tenders received until noon July 11, by John Ramsden, county clerk.

Toronto, Ont.

Subway. Contract for 25,000 yds. of concrete work on the new John street subway will be awarded next week. Cost about $85,000.

Contemplated street extension, $17584. (Brunswick avenue). Owner, Corp. of Toronto. City engineer, W. A. Littlejohn. Brunswick avenue to be extended --Petitions against must be made on or before Aug. 5, 1911. Supplementary report later.

Tavistock, Ont.

Tenders called for drainage. Owner, Tp. of South Easthope, Ont ; clerk, V.

Stock. Construction of three drains, two near Tavistock and one near Stratford. Contractor to furnish materials, tools, etc. Separate tenders for each of three drains accompanied by ten per cent. in cash. Plans, etc., at office of clerk. Tenders received by township council until 7 o'clock, July 17.

Vancouver, B. C.

Tenders called for steam road roller, (10 ton). Owner, City of Vancouver. City clerk, W. McQueen. City engineer, F. L. Fellowes. Recommended that city clerk be instructed to advertise for tenders for roller, to be received not later than 2 p.m. July 11th. Particulars obtained from city engineer

Tenders received for sewers. Supervising engineer, F. L. Fellowes, City Hall, Vancouver. City clerk, Wm. McQueen, City Hall. The following tenders were received: Evans Coleman & Evans, Ltd. $52,608.00; Dominion Glazed Cement Pipe Co., $59,854.20; C. Gardiner Johnson Co., $69,793.00. Sewer trenching machines as follows: A. G. Langley & Co., Ltd., for a "Buckeye" Trenching Machine, f.o.b. Vancouver, $2,500.00; Mussens Limited, for Carson's Lingerwood cableway, f.o.b., $5,571.00; Mussens Limited, for removing steam shovel, 25 ton f.o.b., $7,453.00.

Woodbridge, Ont.

By-law carried for steel bridge, $40,000. Owner, Corporation of Woodbridge. Clerk, E. W. Brown, Woodbridge. The ratepayers carried a by-law to raise $40,000 by debentures for the construction of a bridge over the Humber river.

Whitewood, Sask.

Tenders called for cement sidewalks and crossings. Owner, Corporation of Whitewood, Sask. Sec.-treas., C. S. Barker, Whitewood. Construction of about 66,000 feet of cement sidewalks and crossings. Tenderer to provide all material and deposit 5 per cent. of tender, etc. Tenders received by sec.-treas. until July 15th.

Yorkton, Sask.

Tenders called for waterworks. Owners, Corporation of Yorkton, Sask. Engineers, McArthur & Murphy. About 3,500 ft. of watermain and 3500 ft. sewermain. Plans, etc. on application to sec.-treas. and consulting engineers. A marked cheque equal to 5 per cent. of tenders to accompany each tender. Tenders received until 6 p.m. July 24 by sec.-treas. Advertisement in "Tenders and For Sale Department" of this issue.

CONTRACTS AWARDED

Calgary, Alta.

Trunk sewers (12,000 lin. ft.). Owner, City of Calgary, J. T. Child, engineer. Successful contractor, Mitchell, Jones & Co., Calgary, $172,654. Other tenderers, Orpen Co., $239,040; T. R. Allison, & Co., $205,800, both of Toronto; International Construction Co., $193,500; I. Breckenridge, $210,780; Crown Paving Co., $238,400; F. Fehrenback, $191,420; all of Calgary; Misho & Benjamin, $215,400; Aug. Ilse & J. A. Clark, both of Seattle and I. A. Broley & Co., of Fernie. Details of bids furnished on request to office of MacLean's Daily Reports, Ltd., 220 King street W., Toronto.

Hamilton, Ont.

Pipe sewers. Owner, City of Hamilton; city engineer, A. F. Macallum, Hamilton; contractors, Arthur st., J. J. Armstrong, 57c. per foot; St. Clair Boulevard, city engineer, $2.19 per foot; Main street, city engineer, $1.40 per ft.; Cumberland avenue, J. J. Armstrong, 87c. per foot; Sherman avenue, city engineer, $2.22 per foot; Blake street, J. J. Armstrong, $1.27 per foot. Contract let July 6th.

North Bay, Ont.

Supply of concrete pipe. Engineer, J. Sinton, North Bay; contractor, W. G. Carr, North Bay. 6,470 feet 10-in. tile pipe; 1,332 20-in.; 2,873 24-in.; 1,985 30-in., and 1,700 36-in. concrete pipe. Work to be completed October 1st, 1911.

Cement sidewalks, $25,000. Owner, Town of North Bay. Engineer, J. Sinton, North Bay. Contract awarded to Tarlithic Paving Co., Chatham, Ont. Quantity, 10,000 feet.

Vancouver, B.C.

Grading. City Engineer Fellowes; successful contractor, Laplaca Bros. Construction Co., Vancouver ($12,986). Other tenderers, S. Becker, $14,000; T. R. Nickson & Co., $14,200; W. Allan Kennedy, $24,877. Grading 4th avenue, from Vine street to Alma road.

Walkerville, Ont.

Street paving, $90,000. Owner, Town of Walkerville. Successful contractor, Thomas Chick, Bruce avenue, Windsor. 25,000 yards of asphalt block, 6,000 yards reinforced concrete and about 6,000 yds. cedar block pavement. Work to be started within a week or two and to be finished this year.

Railroads, Bridges and Wharves

Brandon, Man.

Purchase authorized of steel rails. City engineer, R. E. Speakman. The city council has authorized the purchase from the United States Steel Product Co., quantity of 80-lb. steel rails in 60-feet lengths for street railway track to be laid when the asphalt block paving already authorized is put down. The order also includes all necessary specials, bands, fish plates, etc., for the railway.

Galt, Ont.

Proceedings of council; engineering projects. Owner, Town of Galt; city engineer, E. O. Fuce. Recommendations, sewer on William street; plan to be prepared for trunk sewer on Main street. Calling of tenders for an arched concrete and reinforced cement covered bridge across Canada Woollen Mills race.

Heachcote, Ont.

Bridge, $1,200. (Between Collingwood and Euphrasia township). Owner, Co. of Grey. Engineer, J. Wilson, Collingwood; 1 span, 35 ft. 14 ft. roadway, foundation concrete. Tenders called for superstructure and sub-structure until July 10th.

Moose Jaw, Sask.

Proceedings of council. Bridge (Across Thunder Creek). Owner, Corporation of Moose Jaw; city engineer, J. M. Wilson. The engineer was instructed to prepare plans and estimates of cost of a bridge at the corner of Fourth avenue and River street.

Quebec, Que.

Tenders called for railway station, $750,000. Owner, National Transcontinental Railway Co. Architect, March & Hastell, 164 St. James street; 3-storeys 257 x 124. Deschambault stone, concrete foundation. Tenders called shortly. Supplementary report later.

St. Thomas, Ont.

Contemplated, concrete piers. Owner, Michigan Central Railway; division engineer, W. Marble. Preparations are being made to strengthen the approach to the company's cantilever bridge here by the erection of concrete piers.

Toronto, Ont.

Tenders wil be called in a week for construction of five groins between Kew and Balmy Beach to cost $11,000. Groins will be built on unit basis; five feet above water level.

Tenders will be called July 10th for construction of dock at foot of Princess street to cost $10,000. To be built on unit basis.

Tenders will be called in about a week for painting and cleaning and supply of paint for Moore Park, Sherbourne street and Dundas street bridges.

Washdeneoak, Queen's Co., New Brunswick.

Tenders called for concrete pier. Owner, Province of New Brunswick, Fredericton, N. B. 20x4 ft.; 40-ft deep. Tenders will be called about July 10th by P. S. Archibald, Moncton, N. B.

CONTRACTS AWARDED

Harriston, Ont.

Steel bridges Tp. of Minto). 72-ft. steel bridge; 6 bids highest, $2,380 Contractor, Corbett Machine Co., Owen Sound, $1,475. Co. of Wellington, 47 ft. 6 in. span, 16 ft. roadway, steel; 4 bids, highest $1,365. Contractors, Corbett Machine Co., Owen Sound, $985. Bids opened June 23rd; Bowman & Connor, Toronto street, Toronto, engineers.

Princeton, B. C.

Railroad to Coalmont, spur to Portland Cement Works and United Empire Mine, 35 mile. Engineer, L. M. Hale, Princeton, B. C. Contractor, A. Guthrie. The B. C. Portland Cement Works are putting in a large plant and laying out a townsite.

Vancouver, B. C.

Railway. The contract for the construction of the proposed Cowichan Lake branch, has been awarded to Palmer Bros. & Hemmins of this city. Work will be commenced in a few weeks.

Public Buildings, Churches, Schools, etc.

Brockville, Ont.

Hospital. The Provincial Government have approved of the purchase of farm property comprising 253 acres for the Eastern Hospital.

Tenders called for Nurses' Home, $10-000. (Addition). Owner, Brockville General Hospital, Brockville, Ont. Architect, B. Dillon, Brockville; 1-storey 40x50, brick, cement work, cut stone, marble, terra cotta, tile, mantels, fire-proofing, fire escapes, passenger elevator, pipe covering, electrical work, telephone system, asbestos materials, steel beams, iron columns, ornamental columns, electrical lighting, steam heating, interior finish, pine, composition roofing. Tenders received until July 10th

Berlin, Ont.

Tenders called for hospitals. Owner, Town of Berlin; clerk, A. H. Millar. Construction of two Isolation Hospitals and a smallpox shack. Plans, etc., at office of town clerk. Tenders received until noon, July 15, by town clerk.

Chippewa, Ont.

By-law carried for school, $15,000. Clerk, W. Myers, Chippewa. Architect, C. M. Barter, Niagara Falls. By-law carried to expend $15,000 on new building.

Collingwood, Ont.

Heating and plumbing, metal tenders not let. Fire hall, $12,000. Owner, Town of Collingwood. 2-storey, brick, 46 x 73. Building to be completed with gymnasium in attic Jan. 1, 1912. Advertisement in "Tenders and For Sale Department" of this issue.

Calgary, Alta.

By-law carried for university, $150,000. Owner, University of Calgary. The by-law to appropriate $150,000 for erection and equipment of the university was carried by a large majority. Supplementary report later.

Forest, Ont.

Library. Plans are being prepared by Architect Mahoney, Guelph, for a new Carnegie library.

Hamilton, Ont.

Contemplated grandstand, $50,000. Owner, Hamilton Jockey Club, Hamilton. Architect not selected. Steel and stone. Stand is to replace one destroyed July 1st. It will not be definitely planned till end of August. Supplementary report later.

Hull, Que.

Negotiations closed for hospital. Owner, Sisters of Providence, Montreal. City clerk, John F. Boult. The deal is practically closed in regard to the hospital. Next spring additions to the amount of $30,000 will be built. Present property to be converted into a hospital by October.

Kingston, Ont.

School. The Board of Education wants the city council to give $5,000 additional for the erection of a new public school. Construction delayed by building strike.

Kamloops, B.C.

Specifications in progress for Old Folks Home ($125,000). Owner, Dept. of Public Works. Architect, Mr. Owens, Victoria, B.C. Plans provide for an expenditure of $30,000 this year on the east wing, two storeys. Supplementary report later.

Medicine Hat, Alta.

New tenders called for Nurses' Home, $12,000. (Main street). Owner, General Hospital Board, Medicine Hat. 2½-storeys, 60x40, brick and stone, hot water and steam heating, gas and electric lighting, cement work, cut stone, terra cotta, plastering. Tenders received until July 10th. Tenders received before rejected.

Medicine Hat, Alta.

Tenders called for school, $40,000. (Bridge street). Owner, School Board. Architect, W. T. Williams, Medicine Hat. 2-storey, 60x100, brick and stone, concrete foundation, cement work, cut stone, brick, electric and gas lighting, shingle roof, electric work, shingle stain, deafening paper. Tenders received until July 10th.

McLeod, Alta.

Tenders called for municipal hospital. Owner, Corporation of McLeod; Mayor, T. Dickson. Architect, Messrs. Barnes & Gibbs, Imperial Bank Building, Edmonton. Bulk tenders invited. Tenders for plumbing and heating to be kept separate. Plans, etc. at municipal offices, McLeod, and office of architect. Tenders received until noon July 15th. 5 per cent. of amount to be enclosed.

Middleton, N. S.

Plans being prepared for post office and custom house. Owner, Department of Public Works, Ottawa. Sec., R. C. Desrochers. The work will probably be undertaken next year.

Niagara Falls, Ont.

By-law to be submitted for extension of City Hall. Owner, Corporation of Niagara Falls, Ont. Clerk, W. J. Seymour. Architect, C. M. Borter, Niagara Falls. The vote will be taken on July 24th to raise $15,000 to extend city.

Outremon, Que.

Tenders to be called for convent, $100,000. Owner, Fathers of Blessed Sacrament, Mt. Royal and St. Denis. Architect, G. A. Monette, 97 St. James street, Montreal. Stone and brick concrete foundation. Institution will include chapel and will be fireproof.

Tillsonburg, Ont.

Plans under construction for school. Owner, Public School Board, Tillsonburg. The plans for new school are under consideration. Building operations will not commence until next year.

Trail, B .C.

Tenders called for school. Owner, School Board; secretary, F. E. Dockerill, Trail. Architects, A. Currie, Nelson. Digerent trades in connection with 8-room school. Plans, etc., at office of the secretary, or at office of the architects. Tenders received by F. E. Dockerill, secretary, until 12 p.m. July 29th.

Toronto, Ont.

Plans prepared for club house, $3,500. Owner, Don Rowing Club, Toronto. (Private plans). Contractor, Geo. Wibby, 58 Hogarth avenue, Toronto. Frame. Building destroyed on June 30th will be rebuilt immediately according to former plans.

New plans being prepared for church and Sunday School (corner of College and Montrose). Owner, West Presbyterian church, Toronto. Architects, Gordon & Helliwell, Confederation Life Building, Toronto. Various trades required. New tenders will be called. Supplementary report later.

Tenders called for church alterations, (Halton and Dundas streets). Owner, St. Barnabas Church, Toronto. Architect, A. R. Denisen & Stephenson, 18 King street W., Toronto. 1-storey and basement, 96x58, brick, hot air heating, shingle roof, cut stone, cement arches. Tenders close July 6th.

Plans in progress for private patients' building. Owner, Toronto General Hospital. Architect, Darling & Pearson, 2 Leader Lane, Toronto. 5-storey, brick, concrete foundation, forced hot water heating, electric lighting, open plumbing, felt and gravel roofing, terra cotta, tile, fireproofing, armoured reinforced concrete, metallic, lath, structural and ornamental iron, sheet metal work, cornice, skylight, fireproof doors, electrical work, plate and prismatic glass, passenger elevator. Tenders called in about a month.

Tenders called for Government House (Chorley Park, Rosedale, Toronto). Owner, Department of Public Works, Toronto. Secretary, H. F. McNaughton, Toronto. Concrete foundation for new Government House. Plans, etc., at Department. Tenders received by Secretary until July 12th. Advertisement in "Tenders and For Sale Department" of this issue.

Tenders called for addition to Howard school. Owner, Board of Education, Toronto. Sec.-treas., W. C. Wilkinson, Toronto. Plastering work required in completion of addition. Specifications at office of the Supt. of Buildings, City Hall. Tenders received by Sec.-treasurer until noon July 6th. Advertisement in "Tenders and For Sale Department" of this issue.

Vancouver, B. C.

Plans being prepared for school, residence. Owner, residence, R. V. Winch. ($13,000); Wesley Methodist Church. Architects, Thomas Hooper, Winch Building, Vancouver. Plans are being prepared by T. Hooper for above; also for a Methodist Parsonage at Merritt, B. C.

Tenders called for fire hall. (12th avenue and Quebec street). City Clerk, W. McQueen. Architects, S. N. Jarrett, Bldg. Inspector, City Hall, construction work. Tenders received by City Clerk until 4.30 p.m. July 13th.

Y. M. C. A. The plans for the new Y. M. C. A. building have been completed and will be here shortly. H. S. Griffiths, architect, Victoria and Vancouver.

Church. Smith & Goodfellow, architects, 303 Hastings W. have plans for a new Methodist church on Angus Rd., Kerrisdale. Building to be frame 30x60, seating capacity of 200; electric light; cost $3,000. Tenders will be called shortly.

Victoria, B. C.

Tenders called for addition, parliament building. Owner, Department of Public Works, Victoria. J. E. Griffith, Public Works Engineer. Erection and completion of addition etc. Plans, etc., after July 15th at office of Prov. Timber Inspector, Van. Govt. agent, New Westminster and Dept. of Pub. Works, Victoria. Tenders received by Minister Public Works until August 15th.

Wolfville, N. S.

Plans being prepared for library and manual training school. Owner, Arcadia University, Wolfville. President, Dr. G. B. Cutten, Wolfville. Library, $25,000; manual training school, $10,000, brick. Building to be erected this autumn or next summer.

Winnipeg, Man.

Fire hall. The city has purchased a site at the corner of Lipton and Westminster avenue for a fire hall for the district south of Portage avenue and west of Arlington.

Hospital. It has been decided to purchase a lot for a new building in North

Winnipeg, and to commence work on same.

CONTRACTS AWARDED

Montreal, Que.

The contract has been awarded to G. W. Nicholson, Eastern Township's Bank Building, Montreal, for a three storey deaf and dumb institute building, 29 x 50, stone and brick. Ross & MacFarlane, 1 Belmont street, Montreal, architects.

Ottawa, Ont.

Church, $2,500. Owner, First Congregational Church, Ottawa. Architect, A. Dell Weeks, Canada Life Building, Ottawa. General contractors, Holmes & Stark. 60 x 90, brick. Heating and plumbing contract not let yet.

The following contracts have been awarded by the Public School Board: H. N. Giorloff for painting Kent street school, $425; William Howe, painting Creighton street school, $425; Ritchie & Nunn, for painting Rosemount avenue school, $200. For supplying tables and cupboards, etc., for Domestic Science school, J. Oliver & Son, Ltd., $400.

These were the lowest tenderers in each case.

For the heating system of Mutchmor street school the contract for the Webster system was awarded to Mr. J. R. McLennan, for $3,929. The tenders were: J. R. McLennan, Webster system, $3,929; gravity system, $3,313; Johnston system, $4,225. McKinley & Northwood, Webster system, $4,027; gravity system, $3,688; Johnston system, $4,887. Central Hardware Co., Webster system, $4,468; gravity system, $4,383; Johnston system, $5,241. M. M. O'Connell, Webster system, $3,680.50; gravity system, $3,195.50; Johnston system, $3,950; Currie & Livock, Webster system, $6,200; gravity system, $5,339; Johnston system, $6,250.

Toronto, Ont.

At a meeting of the Property Committee of the Board of Education the following tenders were accepted:

Iron stairs, Harbord Collegiate Institute, Canadian Ornamental Iron Company, $3,070; Humberside Collegiate Institute, Shipway Iron Manufacturing Co. $2,725; Oakwood High School, Shipway Iron Manufacturing Co., $6,288.

Iron fence, Harbord Collegiate Institute, Canadian Ornamental Iron Company, $2,200.

S. Pearcy Co., white lead, $120 per ton; linseed oil, $1 per gallon; turpentine, 72 cents per gallon.

Terreno flooring — Oakwood High School, Sanitary Flooring Co., $1,240.

Cleaning and repairing stoves and pipes, E. W. Chard.

Iron stairs, Canadian Ornamental Iron Co., for Balmy Beach, $600; Brown, $2,950; Dugerin, $1,895; Frankland, $1,435; McMurrich, $2,790; Shipwaf Iron Mfg. Co., Howard, $2,168; Manning, $4,952.

Iron fences, Canadian Ornamental Co., Brown, $790; Shipway I.on Company, Kent, $1,575; Lansdowne, $588; Queen Victoria, $805.

Carpenter work, Niagara, $1,298, to M. Hutchinson; Brock and Dovercourt, $187, to O. C. Pook; Clinton, Crawford and Givens, $400, to M. Hutchinson; Dugerin, Duke, Park and Victoria, $1,237, to F. Armstrong; St. Clair, Strathcona and Western, $1,391, to M. Hutchinson.

St. Nicholas Mission, Simcoe Park, was rented for school purposes for $30 per month, including heat and care-taking.

The tender of George White for plastering work at Howard School, $1,515, was accepted, and the previous tender of H. Beaver & Co., disallowed, because of delay in doing the work.

Vancouver, B.C.

The contract has been awarded to La Placa Bros. Construction Co. for the erection of addition to the Lord Tennyson school, $79,400. Messrs. Matheson tendered at $80,560.

Residences

Edmonton, Alta.

Residences. Owner, W. J. Crafts, J. Kenwood, J. Ross, all of Edmonton. General contractors, Cuthbertson, $9,000 brick and concrete block; Pheasy & Batson, 2½-storeys, brick and stone, $11,000; Grant Bros., $7,000, brick and stone, all of Edmonton. Contracts were let on June 26th and 24th.

Hamilton, Ont.

Addition to residence. General contract for addition to residence, $5,000; 2-storey 14x36, brick, electric work, awarded to Wm. Findlay. Work to be completed Sept. 14. Architects, Mills & Hutton, Hamilton.

Medicine Hat, Alta.

Specifications in progress for 10 cottages, $15,000 each. Owner, Crosley Bros., Medicine Hat, Alta. (Private plans). 1½ storeys, 25 x 25 each, frame, concrete foundation, hot air heating, gas lighting, brick, shingle stain. Crossley Bros. have completed 4 cottages and now propose erecting a row of 10 more.

Toronto, Ont.

8 dwellings. W. W. Hiltz, Broadview avenue, will erect 8 dwellings on Chester avenue, 2-storeys, 28x16 ft. 6 in. rough cast, brick foundation, hot air heating, combination lighting, open plumbing, shingle felt and gravel roofing. Work to be done by day labor. Sept. 14th.

Apartment house, $5,200. (48 Grenville street). Owner, J. H. Young, 46 Grenville street, Toronto. Architect, W. H. Mallory, 31 Queen W., Toronto. Mason contractor, A. J. Peppiatt 204 Sunnyside avenue. Carpenter, Wm. Williamson, Woodbine and Queen; 2-storeys, brick, 32x40, brick foundation, hot water heating, combination lighting, felt and gravel roof, interior finish Georgia pine. Contract let June 28th. Other tenders still to be let.

Tenders to be called for dwelling, $3,000, Plater Crescent. Owner, Ernest Preston, 739 Broadview avenue, Toronto. Private plans; 2½ storeys, brick and stone, 43 x 20, stone foundation, hot air heating, combination lighting, slate roof, tile and mantels. Tenders to be called shortly.

Tenders to be called for dwelling, $8,000, 45 Benlomond avenue. Owner, Alex. McLeod, 57 Benlomond avenue, Toronto. Private plans for 2½ storey, concrete and brick, 56 x 38, hot water heating, electric lighting, shingle roof, tile mantels, metallic lath, steel beams, cut stone. Tenders received after July 12, 1911.

Tenders called for twenty-five semi-detached dwellings, $55,000, Campbell avenue. Owner, Deeth & Son, 44 Grove avenue, Toronto. Two storeys, 16 x 35, brick and stone, stone foundation, hot air heating, combination lighting, shingle and felt roofing, cut stone, tile mantels, metallic lath, electrical work, electric bells, plate glass. Tenders received after July 10th until July 17th.

R. Lankin, 81 Hogarth avenue, will erect four dwellings on Curzon street, two storeys, 39 x 32 ft. 6 in., brick front and roughcast, brick fouldation, shingle roofing. To be built by day labor.

B. J. Case, 189 Weston road, will erect a pair of houses on Humberside avenue, 2½ storeys, 33 x 33, brick and stone, stone foundation, hot air heating, combination lighting, open plumbing, felt-gravel and shingle roofing. Will be built by day labor.

Tenders called for residence, $3,000. (Radford avenue). Owner, P. Coltman, 48 Major street, Toronto. 2½ storeys, 18x46, stone and brick, stone foundation, hot water or comb. heating, comb. lighting, slated roof, tile, mantels, electrical work, cornice. Tenders received for all but carpentry until July 20th.

Tenders called for 1 single and 1 pr. semi-det. residence, $7,500. (Lansdowne avenue). Owner P. Coltman, 48 Major street. (Private plans). 2½-storeys, 18x46, brick, stone foundation, hot air heating, shingle roof, tile, mantels, cornice, electrical work. Tenders called until July 11th on all but carpentry.

Tenders called for 2 detached residences, $5,000. (Silver Birch avenue). Owner, Wm. Williamson,. Architect, W. H. Mallory, 31 Queen West, Toronto. 2-storey, 20x38, frame, brick foundation, hot air heating, combination lighting, shingle roofing. Tenders called after July 20, until July 28.

Garage. A 1-storey garage will be erected by Mr. Grant at 11 Constance street, 18x12, wood and galvanized iron, galvanized iron roofing. Wells & Gray, Ltd., 315 Confederation Life Building, Toronto, architects.

Garage. ..A 1½-storey garage will be erected at 172 Rusholme Road, 25x18, brick concrete foundation, tile roofing.

Vancouver, B. C.

Plans being prepared for apartment house, $70,000. (Pendrill and Cardero streets). Owner, M. J. Conlin, 1133 Cordero street, Vancouver. Architect, Patrick J. Donohue, 903 Dom. Trust Bldg., Vancouver. Reinforced concrete foundation, 25 3-room suites. Tenders will be called shortly. Supplementary report later.

Residence. Plans are being prepared by Smith & Goodfellow, architects, 308 Hastings K. for a 6-room frame residence city concrete foundation. Cost, $3,200 at Strathcona, Point Grey.

Tenders to be called for apartment house and store (Bridge street and Eighth avenue). Architect, E. Gardiner, 247 Pender street W. 2-storey and basement 80x80, brick, electric lighting. Supplementary report later. Mr. Garner will also call for tenders for an artment and store building, on esplan- le for North Vancouver Improvement o., 2-storey and basement, brick, 50x , electric lighting.

'innipeg, Man.

Tenders called for school (McPhillips reet). Owner, Public School Board. c.-treas., R. H. Smith, Winnipeg. 4- om, frame. Plans, etc., with J. B. itchell Commrs. of School Buildings, hool Board office. Tenders received sec.-treas. until July 11th.

CONTRACTS AWARDED

rockville, Ont.

Residence King street E.) Owner, r. E. B. Moles, Pine street E. Archi- ct, A. Stuart Allaster, 42 King street . Brockville. General contractor, hn Micks, Brockville; 2½-storeys, 39 0, brick and stucco construction, stone undation, hot water heating, electric hting, shingles, southern pine interior ish, cut stone, pipe covering, sheet tal work, metallic lath, shingle in, plate glass, art glass, prismatic iss, iron columns, mantels, cornice ofing, sheathing paper. Heating and umbing not yet let.

amilton, Ont.

Two residences, $11,500. Herkimer eet and Hamilton Mountain). Own- s, H. E. McLaren and E. Morwick, th of Hamilton. Architects, Mills & itton, Hamilton. General contractor, m. Findlay, Hamilton; both contracts ick, 2 and 2½-storeys. Contracts let ne 29th; residences to be completed

alifax, N.S.

Residence, $3,500. Owner, G. F. nch, Oxford street, Halifax; general ntractor, G. W. Thompson, Halifax, storeys, concrete foundation, 26 x Frame construction.

ontreal, Que.

The contract has been awarded to s. H. Maher, 57 Guardian Building, for erations and additions to four-storey artment house on Milton street.

The contract for a $21,000 residence atholic School Commissioners, own- s) has been awarded to J. K. Grat- n, Ltd., 82 Mercier avenue, Montreal, ree storeys, brick and stone, 32 x 80, t water heating, W. E. Dore, architect.

usiness Buildings and Industrial Plants

andon, Man.

Business opportunity. Purchase of operty, $22,500, opposite new C. N. R. tel. Owner, Sylvester Mfg. Co., andon. Tenders received for pro- rty, 75 x 124, in heart of city until 12 lock, July 14. Terms $1,000 cash, bal- e one third cash and 60 days and 90 ys. Splendid site for store or block.

atham, Ont.

Equipment required for alterations to re, $2,500. (King street). Owner, W. rdon, Chatham. Architect, J. L. Wil- n & Son, Chatham. Copper and plate ass front. Bids will be received until y 10th

chrane, Ont.

Plans prepared for offices, $7,000. vner, W. J. Bauldry, Cochrane, Ont. chitect, H. W. Angus, North Bay; 2- rey 40x44, brick veneer, concrete foundation, hot air heating, electric ltg., felt and gravel roofing, cement work, sheet metal work, metal ceiling, cornice roofing, telephone system, plate glass. Foundation in. Date of calling for tenders for superstructure not yet set. Building to be occupied by New Telephone Co. and Cobalt Power Co.

Edmonton, Alta.

Hotel. A $50,000 hotel is to be erected in Edmonton, 3-storeys and basement—brick and steel, steam heating, electric lighting, tar and gravel roofing, cement work, cut stone, brick, metallic lath, structural iron, fire escapes, electrical work, electric bells, steel beams, iron columns, combined rooming house, lunch room and cafe. Barnes & Gibbs, architects.

Work in progress for storehouse and offices, $25,000. Owner, Massey-Harris, Edmonton. Architect, Hopkins & Wright, Edmonton. 50x70, frame cement work, electrical work, roofing. The company have engaged foremen to take charge, the construction being done by day labor.

Plans being prepared for foundry, $20-000. Owner, Edmonton Iron Works, Edmonton. Architect, H. A. Magoon, Edmonton. 50x75, cement work, brick, structural iron, electrical work. Tenders will be called at an early date.

Fort William, Ont.

Tenders called for store, $3,000, Simpson street. Owner, Mr. Kaslar, Simpson street, Fort William. Architects, Hood & Scott, Fort William. Two storeys, solid brick, concrete foundation, 25 x 65. May be increased to three storeys. Tenders received until 14th July.

Goderich, Ont.

Plans under consideration for factory. Architect, F. A. Fowler, Goderich. Machine shop for company being promoted by Doty Engine Works, Winnipeg and Goderich, 120x40, brick, saw tooth roof and wired glass, $7,000. Supplementary report later. Company will manufacture grain car doors, woodworking, etc.

Grand Pre,' N. S.

Contemplated 2 storage buildings. Owner, W. H. Chase, Wolfville, N. S. 1-storey and basement, steel and frame, stone foundation, $4,000.

Hillsboro, N. B.

Tenders being called for plaster mills, $100,000. Owners, Albert Mfg. Co., Hillsboro; N. B. 4-storey, wood and iron, stone foundation, steam heating, fireproofing, brick, structural iron, sheet metal work. Private tenders being received by C. J. Oswan, Hillsboro, N. B.

Ingersoll, Ont.

Plans being prepared for addition to factory, $12,000. Owner, John Morrow Machine Screw Co. Architects Stewart McPhie, Hamilton. 1 and 2 storeys, 75 x100, 40x60, brick, stone foundation; steam heating, cement walk, fireproof doors, tar and gravel roof; electric ltg. a little plumbing. Supplementary report later.

Kentville, N. S.

Owner, Hillcrest Orchards, Ltd., R. S. Eaton, mgr., Kentville, 1-storey and basement, frame. Buildings to be used for storing apples.

Lethbridge, Alta.

The A. MacDonald Co. will erect a three-storey and basement brick warehouse on Smith street. Tenders are being called.

Moose Jaw, Sask.

Plans in progress for warehouse. Owner, Tees & Persse, 315 William street, Winnipeg. Architect, not yet chosen. Plans are being prepared for a six-storey warehouse.

Montreal, Que.

Office. Henry Morgan & Co. will call for tenders at once for a 10-storey office building, on St. Catherine street, between Manc and Balmoral.

Contemplated, office, Beaver Hall Hill and Craig street. Owner, Sheddon Forwarding Co., 38 Victoria Square Montreal. President, Hugh Paton. Ten storeys. After present building is torn down work will commence. Supplementary report later.

MacLeod, Alta.

The Canadian Northern Railway have decided to erect their western shops at MacLeod. Plans are prepared for passenger and freight stations.

Niagara Falls, Ont.

Machinery required for hat factory. Owner, Hawes Von Gal. Manager, E. J. Von Gal, Niagara Falls, Ont. The large addition to the Hawes-Von Gal hat factory is nearly ready to have machinery installed.

North Bay, Ont.

Plans being prepared for store and offices, $17,000. Owner, H. S. Campbell, North Bay; architect, H. W. Angus, N. Bay. 3-storey and basement, 37x90, brick, steel and wood, stone foundation, steam heating, electric lighting, cut stone, brick, tile, sheet metal work, vaults, metal ceiling, cornice, skylights, pipe covering, steel beams, art and plate glass, interior pine finish. Date or receiving tenders not decided yet. Complete working plans before end of month.

Ottawa, Ont.

Tenders to be called for warehouse, Queen street. Owner, J. M. Garland & Sons, Ottawa; architect, A. L. Weeks, Canada Life Building, Ottawa. Tenders to be called shortly for plumbing and heating, steam heating.

Tenders to be called for stores, Wellington street. Owner, D. H. MacLean, Ottawa; architect, W. E. Noffke, Ottawa. Two storeys, brick, 90 x 50, concrete foundation, tar and gravel roof, electric lighting, structuaral iron, sheet metal. Tenders called next week.

Regina, Sask.

Warehouse. The Finance committee have recommended the council to sell lots 9, 10 and 11 to Armstrong, Smith & Dowswell as a site for a proposed warehouse.

Negotiations in progress for department store. Owner, Hudson's Bay Co., London, Eng. Stores commrs., H. E. Burnbridge, Winnipeg. Co. looking after site, frontage of 150 ft. on Rose st. and 125 on Eleventh avenue. No decision made. D. M. Hackney, real estate agent, is interested. Supplementary report later.

Stratford, Ont.

Tenders called for business block. Owner, Senate Cigar Store, Stratford; architect, Taylor and Taylor, Brantford. Enlargement and improvement of block.

(Continued on page 64)

Tenders and For Sale Department

To Architects

F. [illegible] French Architect, 1811 Rue St U[illegible] [illegible] Montreal, formerly architectural expert [illegible] Courts of France, "Master-of-Work" of [illegible] the syndicate of French architects, designer of numerous important architectural constructions erected in France, desires either association with architect having work in hand, or the direction of an architectural drafting office in a large firm. 27-28

Notice to Ditch Contractors

Tenders Wanted

Tenders will be received by the undersigned up to 2 o'clock p.m., on **Friday, July 14, 1911**, for the construction of Municipal Drain No. 1 in the Township of Maryborough, containing about 33,000 cubic yards of excavation.

Plans, profiles and specifications of this drain may be seen at the Township Clerk's office in the Village of Moorefield.

The lowest or any tender not necessarily accepted. Satisfactory bondsmen or a marked cheque of 5 per cent. of the tender will be required.

W. W. SCOTT,
Clerk of Tp. of Maryborough.
Moorefield P. O. 27-28

CITY OF REGINA

Sidewalk Construction

Sealed tenders addressed to the City Commissioners, Regina, and endorsed on enevelope "Tender for Sidewalk Construction," will be received up to 12 o'clock noon, **Friday, July 28th, 1911**, for the construction of approximately 175,000 square feet of concrete sidewalks.

Particulars may be had upon application to the City Engineer.

A marked cheque for $1,400 must accompany each tender.

The cheque of the unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

(Signed) L. A. THORNTON,
28-29 City Engineer.

CITY OF REGINA

Pavement Construction

Sealed tenders addressed to the City Commissioners, Regina, and endorsed on envelope "Tender for Pavement Construction," will be received up to 12 o'clock noon, **Friday, July 28th, 1911**, for the construction of approximately 37,500 square yards of pavement and 24,000 lineal feet of curb and gutter.

Particulars may be had upon application to the City Engineer.

A marked cheque for $5,000 must accompany each tender.

The cheque of the unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

(Signed) L. A. THORNTON,
28-29 City Engineer.

Bucket Crane

FOR SALE—One full circle, self-propelling, modern 10 to 15-ton capacity Browning size No. 1 Locomotive Crane, standard gauge, 4-wheel truck, 38 ft. steel boom, 8 x 10 engines, equipped to handle Clam or Orange Peel. Will furnish with or without bucket. Attractive price, fine condition, quick delivery. Inspection here.

WILLIS SHAW MACHINERY CO.
39 So. LaSalle Street Chicago.

Tenders

Sealed tenders addressed to the undersigned will be received until noon on **Monday, July 17**, for the construction of a reinforced concrete beam bridge over the Otter Creek on the town line between the Townships of Sombra and Chatham. Plans and specifications may be seen at the residence of Neil McGugan, Wilkesport, and at William Abraham's, Chatham Township, or at the office of the undersigned.

BELL & McCUBBIN,
Civil Engineers.
St. Thomas, July 8, 1911. 28-28

TO CONTRACTORS

Tenders will be received by the undersigned up to 2 o'clock p.m., on **Monday, July 17th**, for the construction of a Municipal Drain in the Township of Arthur, Wellington County. Plans, profile and specifications may be seen at the Clerk's office, Kenilworth. A marked cheque for ten per cent. of contract must accompany each tender.

The lowest or any tender not necessarily accepted.

ALBERT HELLYER, Clerk,
28-28 Kenilworth P.O.

CITY OF MOOSE JAW
Saskatchewan

TENDERS

Sealed tenders addressed to the undersigned City Clerk will be received in the Council Chamber, Moose Jaw, up to 8.30 p.m. on **Monday, July 24th, 1911**, for the supply of the following electrical apparatus:—

Contract A.

Fifty 6.6 Ampere, Direct Current, series, Metallic flame arc lamps, complete with globes, etc.

Fifty Absolute cut-out hangers.

One Current Regulator, 50 lamp circuit.

One Mercury Rectifier, 50 lamp circuit.

One Control panel with switches, 50 lamp circuit.

Contract B.

Fifty ornamental arc lamp standards.

Full particulars and specifications may be obtained from J. D. Peters, Electrical Superintendent, Moose Jaw, Sask.

The lowest or any tender not necessarily accepted.

W. F. HEAL,
25-28 City Clerk.

Contractors' Material

Brown Locomotive Crane, 10 ton capacity, at 14 feet. Overhauled.

Canadian Rand New Giant Rock Drill, No. 431, tripods and weights.

Ingersoll "Little Giant" Rock Drill, No. 3¼, tripod and weights.

Cooper No. a Small Rock Drill, with tripod.

6 x 4 American Steam Pump, Valve, piping and elbow.

New Size B Pulsometer Pump.

30 h.p. Upright Boiler, 46 in x 10 in., complete.

Screen for stone crusher, 24 in. x 6 ft.

Have you anything to sell? Write us.

THE MALES COMPANY,
No. 82 Perin Building,
c Cincinnati, O.

Corporation of the City of Nanaimo
B.C.

Street Paving

Tenders are invited for approximately 14,450 superficial yards of Asphaltic Macadam or other approved paving.

A plan of streets and further particulars may be obtained of the undersigned.

Sealed tenders endorsed "Tender for Paving" to be sent to the undersigned not later than **July 21, 1911.**

The lowest or any tender not necessarily accepted.

ALLAN WATERS,
City Engineer.
June 26, 1911. 27-29

CITY OF TORONTO

Tenders
For the
Construction of Cribs
At the City Yard, Princess Street
Toronto

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on **Monday, July 24th, 1911**, for the construction of cribs at the City Yard, Princess street.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained on application to the Department of Railways and Bridges, City Engineer's office, Toronto.

The tenderers shall submit with their tenders the names of two sureties (approved of by the City Treasurer, not members of the City Council or officers of the Corporation of the City of Toronto) or in lieu of said sureties the bond of a guarantee company approved of as aforesaid.

The lowest or any tender not necessarily accepted.

F. S. SPENCE,
President of the Board of Control.
City Hall, Toronto,
July 7th, 1911. 28-29

Bridge Tenders

Sealed tenders will be received by Geo. M. Fox, Esq., Warden, Wellington County, Drayton, Ont., up till 2 p.m. on **Friday, July 21st,** for building the following:

1. Douglas 40-foot concrete arch bridge and breakwater near Glen Allen.
2. Concrete breakwater, 10 feet high and 200 feet long, near Glen Allen.
3. A 40-foot girder bridge, 18-foot roadway, also near Glen Allen.

For further information apply to

BOWMAN & CONNOR, Engineers,
36 Toronto Street, Toronto.
or
J. A. WILKINSON,
27-28 Morriston, Ont.

Tenders for Reinforced Concrete Bridge

Tenders will be received by the undersigned at the Court House in the City of Brantford, up till noon, **Saturday, the 15th inst.**, for the construction of a reinforced concrete bridge having a span of 75 feet on the Town Line between Brantford and Burford, one mile north of Bishop's Gate and two miles from the Village of Burford.

Plans and specifications may be seen at the County Clerk's Office at the Court House, Brantford.

Dated this 5th day of July, 1911.

(Signed) WILLIAM MILMINE,
Chairman, Road and Bridge Com.
28-28 County of Brant.

The Algoma Central and Hudson Bay Railway Company

Tenders for Railway Construction

Sealed tenders for the construction of the Algoma Central Railway Extension from Hobon on the C. P. R., northerly to the National Transcontinental Railway at a point approximately 142 miles west of Cochrane, a distance of 101 miles, will be received up to noon **July 15, 1911.**

The work includes all construction work to sub grade, and in addition, track laying and ballasting in accordance with plans, profiles, forms of tender and specifications at the office of the Chief Engineer, Sault Ste. Marie, Ontario.

All tenders to be marked "Tender for Construction," and to be addressed to R. S. McCormick, Chief Engineer, Algoma Central Railway, Sault Ste. Marie, Ontario.

The lowest of any tender not necessarily accepted. 26-28

VILLAGE of TAVISTOCK

Tenders for Pumping Equipment

Tenders will be received up to **Thursday, July 20th next,** for two half million gallon Steam Pumps, one Boiler etc.; also 1000 feet of Fire Hose. Plans and specifications may be seen at the office of either of the undersigned.

The lowest or any tender not necessarily accepted.

F. W. FARNCOMBE,
Consulting Engineer, London
J. G. FIELD,
Clerk of Tavistock,
27-28 Tavistock

TENDERS

Tenders will be received up to the **21st July,** from steam fitters, bricklayers, carpenters and painters, for altering, reheating and ventilating the public school at Napanee, Ont.

Plans and specifications can be seen with the clerk of the School Board at Napanee and also at the office of the architects, G. M. Miller & Co., 59 Yonge street, Toronto. Tenders can be sent to either of the above parties.

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Town of Yorkton will be received up till six o'clock p.m. **Monday evening, July 24, 1911,** for the construction of approximately thirty-five hundred (3,500) feet of Water Main and thirty-five hundred (3,500) feet Sewer Main in the Town of Yorkton. Plans and specifications may be obtained on applying to the Secretary-Treasurer of the Town of Yorkton, or the consulting engineers. A marked cheque equal to five per cent. of tender must accompany each tender. The lowest or any tender not necessarily accepted.

McARTHUR & MURPHY,
Engineers.
T. F. ACHESON,
27-28 Secy.-Treas.

WOODBRIDGE

Tenders for Concrete Abutments

Sealed tenders, plainly marked as to contents, will be received by Ed. H. Brown, Village Clerk, Woodbridge, Ont., up to eight o'clock p.m., on **Monday, July 24th, 1911,** for the construction of Concrete Abutments for a Steel Bridge in the Village of Woodbridge, in the County of York.

Plans and specifications may be seen and all necessary information may be obtained at the office of the undersigned, 57 Adelaide street east, Toronto.

The lowest or any tender not necessarily accepted.

FRANK BARBER,
Engineer.
Toronto, July 7th, 1911 28-28

Corporation of the City of Westmount

City Surveyor's Department

Tenders are invited for the erection of the Upper Level Fire Station (No. 2).

Drawings, specifications and form of contract can be seen at the City Surveyor's office on and after the **17th of July, 1911.**

Copies of drawings and specifications can be obtained on payment of Fifteen Dollars, which will be refunded on receipt of a bona fide tender and return of plans and specifications.

Sealed tenders, marked "Fire Station" contract are to be deposited with the City Clerk, Westmount City Hall, not later than twelve noon on **27th July, 1911.**

Tenders will be opened by the Mayor sitting in public at 5 p.m., 27th July, 1911.

The council does not bind itself to accept the lowest or any tender.

ARCH CURRIE,
City Surveyor.
City Hall, Westmount, Que. 28-28

Tenders for Waterworks

Town of Dresden

Tenders addressed to J. T. Bridgwater, town clerk, Dresden, will be received up to noon on **Wednesday, the 26th day of July next,** for 4, 6 and 8 inch cast iron water pipe, about 13,000 feet in all, also about 35 hydrants, also two half million gallon steam driven pumps.

Plans and specifications may be seen at the offices of either of the undersigned. The lowest or any tender not necessarily accepted.

F. W. FARNCOMB, C.E.,
Consulting Engineer,
64 Bank of Toronto Chambers,
London, Ont.
J. T. BRIDGWATER,
Town Clerk,
28-29 Dresden, Ont.

Water Works Intake

Tenders will be received until **July 27th next** for an Intake Pipe and Filter Basin for the Town of Southampton. Plans, etc., may be seen at the town clerk's office and at our offices in Toronto and Berlin.

BOWMAN & CONNOR, Engineers,
36 Toronto Street, Toronto.

FOR SALE

Complete Electric Generating Set, consisting of Leonard Peerless steam engine direct connected to 150 k.w. Canadian General Electric generator, 2,300 volts, 60 cycles; also condenser, switchboard, steam and exhaust piping, spare parts for engine and generator, and everything constituting the complete set as at present installed in the Thomas street lighting station of the Town of Brockville. This machine is in first-class order, having only been used on peak loads. It is now being replaced by a larger Belliss & Morcom engine with Swedish G. E. generator. Full particulars and price can be obtained from Laurie & Lamb, Consulting Engineers, Board of Trade Building, Montreal.

28-35

CITY OF TORONTO

Tenders for the Supply of Paint and for the Cleaning and Painting of Bridges

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on **Monday, July 31st, 1911,** for the supply of Paint, and for the Cleaning and Painting of Three Bridges in the City of Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained on application to the Department of Railways & Bridges, City Engineer's office, Toronto.

The tenderers shall submit with their tenders, the names of two sureties (approved of by the City Treasurer, not members of the City Council or officers of the Corporation of the City of Toronto, or in lieu of said sureties the bond of a guarantee company approved of as aforesaid.

The lowest or any tender not necessarily accepted.

F. S. SPENCE,
President of the Board of Control
[illegible]

City of Toronto

TENDERS

for the Construction and Placing of

GROYNES

in Lake Ontario at Kew Beach, Toronto

Tenders will be received by registered post only addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on **Monday, July 24th, 1911**, for the construction and placing of Groynes in Lake Ontario at the foot of the following streets:—

Woodbine avenue,
Waverley avenue,
[illegible] avenue,
McLean avenue (Howard)
Beech avenue.

Envelopes containing tender must be plainly marked on the outside as to contents.

Specifications and form of tender may be obtained on application to the Department of Railways & Bridges, City Engineer's office, Toronto.

The tenderers shall submit with their tenders, the names of two sureties (approved of by the City Treasurer, not members of the City Council or officers of the Corporation of the City of Toronto, or in lieu of said sureties the bond of a guarantee company approved of as aforesaid.

The lowest or any tender not necessarily

F. S. SPENCE,
President of the Board of Control.
City Hall, Toronto, July 8, 1911. 28-29

Business Buildings and Industrial Plants

(Continued from page 61)

Plans, etc., at offices of the architects, or on application to owner. Tenders received by F. J. Patrick, Stratford, Ont., until noon, July 12.

Sydney, N. S.

Tenders called for shops and offices, $23,000. (Esplanade). Owner, A. N. Crotton, Sydney. Architect, R. S. Dahl, Sydney. 4 storeys in rear, 44x80, concrete and iron, hot water heating, electric lighting, tar and gravel roofing, cement work, fireproofing, armored concrete, ornamental iron, fire escapes, skylighes, electrical work, telephone system, steel beams, iron columns, plate flass, metallic lath, fire escapes, steel beams, iron columns, roofing. Tenders received until July 10th.

Toronto, Ont.

Plans prepared for store and school, $12,000. (Gerrard street E.) Owner, F.M. Johnston, 4 Victor avenue, Toronto. (Private plans). 2-storeys, 32x86, brick, brick foundation, hot water heating, felt and gravel roof, plate glass. Tenders have been called.

Winnipeg, Man.

Factory. H. F. Ledoux, Ltd., plan to establish a factory here for the manufacture of cigarettes.

Tenders called for steam boiler. Secretary board of control, M. Peterson, Winnipeg. Supply and erection of boiler required for incinerator plant in Ward 7. Plans, etc., at office of city engineer, 223 James avenue, Winnipeg. Tenders received by chairman, board of control, until 11 a.m., July 13.

Vancouver, B. C.

Maclure & Fox, architects, Pacific Block, are calling for tenders on one-storey brick building, 75 x 120, on Dunsmuir street, between Seymour and Granville. Owner, W. F. Huntting, 1185 Burnaby street.

Gould & Champany, architects, Bower Building, are calling for tenders on granite and stone work for the Rogers' Building, corner Granville and Pender. Plans and specifications may be seen at the office of the above architects.

Permit has been issued to the National Finance Co. for the erection of a sevent-storey brick and reinforced office building at 325 Howe street. Thos. Hooper, Winch Building, achitect. Adkinson & Dill, 347 Pender west, contractors. Cost, $100,000.

Permit has been issued to the Chinese firm of Leon Way & Co., for a four-storey brick rooming house and store building, at 295 Harris street. Cost, $30,000. Birds & Blackburne, Loo Building, architect. Adkinson & Dill, 347 Pender west, contractors.

Permit has been issued to G. E. Trorey for repairs to Tourist Hotel, 1200 Granville street, to cost $2,600. W. H. Pawson, 410 Crown Building, architect. Western Sheet Metal Co., 1253 Howe street, contractors.

Permit has been issued for a frame addition to store and residence, 1936 Broadway west, to S. Patrick, 1924 Broadway west, to cost $1,600. C. Lillington, 1800 8th Avenue west, architect and contractor.

CONTRACTS AWARDED

Chapleau, Ont.

Stores, $4,300. Owner, Desjardins & Langis, Chapleau. Architect, H. W. Angus, North Bay. General contractor, J. A. Bernier, Chapleau, Ont. 1-storey, 48x55, frame, metal ceiling, plate glass fronts, felt and gravel roof. Heating and plumbing contract not let yet.

Edson, Alta.

Coal bunkers, $15,000. Owner, Grand Trunk Pacific. General contractor, A. Beatson, Edmonton. The work will consist of piling for foundation; a concrete cap over this to form a foundation for the frame work of the sheds, the roof will be tar and gravel. Contract let June 26th.

Hamilton, Ont.

Store, $4,000. (Elgin street). Owner, Mrs. Tegart. Architect, E. B. Patterson, 167½ King street E., Hamilton. General contractors, Frid Bros., Hamilton. Carpenters, Brenner & Penny, Hamilton. 3-storeys and basement, brick, 22x45. Contract let July 4th; Heating, plumbing, sheet metal, iron, electric and gas contracts to be let later.

North Bay, Ont.

Warehouse, $25,000. Owner, Yonge Co., Ltd., North Bay. Architect, J. F. Brown, Toronto. Mill construction, 3-storey and basement, 60x120. General contractor, Hughes & Co., North Bay. Heating and plumbing contracts not let yet. Ground floor to be used as general and private offices of Company.

New Westminster, B. C.

Offices, $150,000. Owner, The People's Trust Co., Ltd., New Westminster, B. C. Architect, W. A. Doctor, Vancouver. Contractor for concrete work, Fraser Valley Tile & Cement Co., Ltd., New Westminster; 8-storeys, 66 x 132, brick, terra cotta, tile, mantels, fireproofing, artificial stone, fire escapes, freight and passenger elevator, sheet metal work, vaults, cornice, metal ceiling, sprinkler system, plate and art glass, electrical work.

Toronto, Ont.

Office, $5,000 (Dundas street). Architect, J. N. Cowan, 65 Adelaide street E., Mason contractor, Venn & Evanson, 776 Crawford street. Carpenter contractor, E. H. Stanford, 535 St. Clarence. Wiring contractor, W. E. Sheppard, Bank street; brick and artificial stone, stone foundation, hot water heating, gas and electricity, modern plumbing, slate roof, interior maple flooring, 3-storey, 21x60. Heating and plumbing contract not let yet.

Moose Jaw, Sask.

Meat packing plant, $150,000. Owner, Gordon, Ironsides & Fares, Winnipeg, Man. Official in charge, G. W. Rudesill, Moose Jaw, Sask. Contractor, D. D. Davies & Co., Chicago, Ill. Excavation has commenced.

Montreal, Que.

The contract for a $27,000 office and factory building on King street for the McClary Manufacturing Company, Ltd., has been awarded to C. E. Deakin, storeys, stone and concrete, 106 x 114, felt and gravel roof, galvanized cornice.

The contract has been awarded to the Atlas Construction Co. for a five-storey building on 65 Alexandra street by the Gillette Safety Razor Co., Ltd. Concrete, 105 x 76. Contract price, $112,000. Lockwood & Grace, Boston, architects.

Power Plants, Electricity and Telephones

Edmonton, Alta.

Negotiations about completed for gas franchise. Parties interested, Utilities Commrs. and the International Lighting & Heating Co. Represented by Mr. Eaton. The agreement will require work to commence this year, and a fixed sum to be expended each year on additions and extensions. Supplementary report when agreement is presented to public for tenders, etc.

Niagara Falls, Ont.

Work in progress for power plant, $66,000. Owner, American Cyanide Co., Niagara Falls, Ont. Electric furnaces, retorts, cranes, conveyors. Extension of factory. The company have started work on extension. Work being done by day labor.

Machinery required for power house extension, $500,000. Owner, Toronto Niagara Power Co., Niagara Falls. Equipment, $300,000 for generators, governors, turbines, pen-stocks, eac. Construction ($200,000) will begin at once by day labor.

Sault Ste. Marie, Ont.

Tenders called for wireless telegraph station. Owner, Department of Naval Service, Ottawa, Ont. Deputy Minister, G. J. Desbarats, Ottawa. Erection of station. Plans, specifications and form of contract to be entered into can be seen and after July 1st at the office of the Supt. of Wireless Telegraphs, Dept. of Naval Service, Ottawa; the office of the Agent of the Dept. of Marine and Fisheries, Parry Sound, Ontario, or the office of the Supt. Engineer of Sault Ste. Marie Canal, Sault Ste. Marie, Ont. Tenders received by Deputy Minister until July 15th.

BOILERS

Fitzgibbon Type of Boilers built for McLachlin Bros., Arnprior, Ont.

BOILERS, of All Kinds for Any Service

"Inglis" Boilers are Designed and Built by Skilled and Experienced Workmen.

"Inglis" Boilers are Built of the Best Material that can be procured.

"Inglis" Boilers are Made in Shops Equipped with the Latest and Most Modern Machinery.

Workmanship, Quality, Quick Delivery and Fair Prices, together with Fifty-Two 52 Years' Practical Experience, have made "INGLIS" Boilers the "Standard." Write us for prices.

The John Inglis Company Limited
Engineers and Boilermakers
14 Strachan Ave., TORONTO, Canada

Miscellaneous

Brandon, Man.

School. Owner, Public School Board, Brandon. Architect, T. Sinclaire, Brandon. Heating and plumbing contract awarded to Brandon Heating and Plumbing Co., Brandon. The above firm also received contract for heating and plumbing in school in Souris, Man.

Guelph, Ont.

Ald. C. W. Kelly has been granted six weeks leave of absence, during which time he purposes visiting several American cities to get information regarding auto fire apparatus and fire halls.

Halifax, N. S.

Laboratory, $25,000. Owner, Commissioner of Public Works and Mines, Halifax, N. S. General contractor, F. A. Ronnan, 16 Prince street, Halifax. Brick and stone building.

Saskatoon, Sask.

Recent permits include the following: W. Storey, frame residence, 7th avenue, $4,000; F. Cahill, brick office block, Avenue A., $50,000; H. D. McKay, frame residence, Avenue G, $4,000; W. G. Hunt, two-storey brick addition, 23rd street, $20,000; E. A. McNash, frame residence, 8th street, $2,500.

Winnipeg, Man.

Recent Permits include the following: A. E. Fulljames, two dwellings, Corydon avenue, $9,000; D. Menzie, dwelling, Merrion avenue, $2,000; Boyle-Higgins Co., dwelling, Morrison avenue, $2,500; B. Lindal, dwelling, McGee street, $2,000; P. Fife, dwelling, McMillan avenue, $3,200; Arni Eggertson, dwelling, Arlington street, $4,500; W. E. Graham, dwelling, Pine street, $2,500; J. H. Blair, dwelling, Chalmers avenue, $2,200; G. F. R. Harris, dwelling, Harvard avenue, $7,500; B. Goldstein, two dwellings, Flora avenue, $5,000; C. M. E. Williams, dwelling, Aubrey street, $3,000; J. Thistlewaite, dwelling, Beresford avenue, $1,800; J. Hodder, two dwellings, Selkirk avenue, $3,000; F. S. Parlee, dwelling, Canora street, $5,500; A. Simpson, dwelling, Evanson street, $3,500; W. McKelvey, dwelling, Alexander avenue, $2,500; J. C. Waugh, duplex dwelling, River avenue, $15,000; F. Nation, business block, Portage avenue, $21,000; J. H. Morgan, dwelling, Morley avenue, $2,200.

Unclassified Items

Brantford, Ont.

Work in operation for new industry, Sydenham street. Owner, Brake Beam Co., Buffalo, N.Y.; Canadian branch of this company is being established in Brantford. The machinery has arrived and is being erected. The work on the first order for 4,000 brake beams will commence at once.

Campbellton, N.B.

Tenders called for heating and ventilating school. Owner, Board of Trustees; architect, Leslie R. Fairn, Aylesford, N.S. New school under construction. Tenders for heating, etc., close July 15, 1911.

Hamilton, Ont.

Heating system required for school, Caroline street. Owner, Board of Education; secretary, R. F. Foster, City Hall; architect, Munro & Mead, Main & Hughson streets, Hamilton. Steam or hot water, $3,000. Architects will soon call for tenders.

Tenders to be called for factory, Sanford & Wilson. Owner, Tallman Brass Company; architect, Stewart & Witton, Hughson street south; addition to finishink department, 64 x 93, $12,000; addition to fnundry, 43 x 20, $1,000, one storey and basement (both), brick and steel, stone foundation, steam heating, electric lighting, Careys roof, cement work, structural iron, sheet metal work, skylights, steel beams, iron columns, roofing, wired glass, area gratings, one 75 h.p. boiler. Tenders received by company after about three weeks.

Plans being prepared for extension to factory. Owner, The Canadian Tungsten Lamp Co., Hamilton; president and general manager, W. H. Ginder. The president was authorized at the annual meeting to get plans and specifications for a five-storey extension, work to commence as soon as possible.

Kindersley, Sask.

Tenders called for school. Owner, Board of Trustees, Kindersley; acting secretary, J. D. MacLeod, Kindersley. Four rooms and auditorium, brick. Plans and specifications may be seen at the office of the acting secretary or at the office of the managers of the following firms: J. H. Ashdown Hardware Co., Main street store, Winnipeg, Man.; Peart Bros., Regina, Sas..; Isbister & Prette, Saskatoon, Sask. Tenders to be accompanied by a deposit of five per cent. of amount of tender. Tenders received by the acting secretary until 5 p.m., July 25.

Lethbridge, Alta.

Tenders to be called for school, $4,000. Owner, Hyssop S. D. No. 2,447, Lethbridge; architect, Whiddington Bros., Lethbridge. One storey, 34 x 34, brick, concrete foundation, hot air heating, shingle roof. Tenders received after July 15 until July 25. Supplementary report later.

Niagara Falls, Ont.

Machinery required for grading. Owner, Thomas Battle, Niagara Falls. Required, Feldspar grading machinery.

Neepawa, Man.

Tenders closed for round house. Owner, Canadian Pacific Railway, brick, 5-stall. Plans and specifications with C. P. R. engineer, Winnipeg, or C. P. R. superintendent, Brandon. Tenders closed July 7.

Toronto, Ont.

Plans in progress for rectory, $8,000, Dufferin street. Owner, St. Annes Church, Toronto; architect, Gordon & Helliwell, Confederation Life Building, Toronto. 2½ storeys, brick and stone, hot water heating, combination lighting, slate roof, hardwood interior finish, electric work, plate glass, tile, mantels, metallic lath, cornice, plate glass, structural iron. Tenders will be called in about three weeks.

Plans in progress for branch bank, Bloor and Sherbourne streets. Owner, Dominion Bank, Toronto; architect, J. M. Rule. Two storeys, brick and stone, cut stone, hot water heating, felt and gravel roofing.

School, $36,825, Essex street. Owner, Board of Education; secretary, W. C. Wilkinson, City Hall; contractor, masonry, G. T. Gayton, 2 Wayland avenue; carpentry, Crocker & LeDrew, 185 Ossington avenue; painting, P. Phinnemore, 536 Brunswick avenue; plastering, M. J. Haildock & Son, 792 Crawford street; roofing tinsmith, J. T. Flowers, 5 Denison avenue; iron work, W. H. Sluter, Toronto; terra cotta, Robert Bennet, 347½ Euclid avenue. All contractors of Toronto.

Contract awarded for parish house, $15,000. Owner, St. John's Church; architect, Symons & Rae, 15 Toronto st., Toronto; masonry, W. G. Veal & Son, Toronto; carpentry, Betson & Terry, 3 Fenwick avenue; plastering, J. S Trail, 62 Argyle street; plumbing, F. Armstrong & Co., 277 Queen west; galvanized iron, A. Mathews, Ltd., 256 Adelaide street west; steel, Reid & Brown, 63 Esplanade east; wiring, D. A. Hills, 1039 College street. All contractors of Toronto.

Thorold, Ont.

Tenders called for paving. Owner, Corporation of Thorold; clerk, D. J. C. Munro, Thorold; engineer, J. C. Gardner, Niagara Falls, Ont. 5,800 lin. ft. of 16 ft. macadam road. Tenders received by clerk until July 15.

Vancouver, Kamloops, B.C.

Railroad. Owner, Canadian Northern Railway; general contractor, Northern Construction Co., of Winnipeg; P. Welch, Spokane. Sub-contractor, Aylmer Bros. & Henning, of Vancouver, Hope to Yale, 14 miles; Burns & Jordon, Spokane, Wash., Yale east 14 miles; Geo. Chew, Spokane, 5½ miles; Cunningham & Co., of Greenwood, B.C., 5 miles, Boston Bar; W. P. Tierney & Co., Vancouver, 11 miles; A. E. Griffin and Jas. Welch, 19 miles to Lytton; Grant, Smith & Co., Seattle, Lytton to Spence's bridge, 23 miles; Twohy Bros., Portland, Ore., Spencer Bridge east 41 miles; Grant, Smith & Co., 30 miles to Kamloops.

Woodbridge, Ont.

Tenders called for concrete abutments. Owner, Village of Woodbridge; clerk, Ed. H. Brown, Woodbridge; engineer, Frank Barber, 57 Adelaide street east, Toronto. Concrete abutment for steel bridge. Plans and specifications at office of engineer. Tenders will be received by clerk, until 8 p.m., July 21.

Whitewan's Creek, Ont. (2½ miles N.E. of Burford Village).

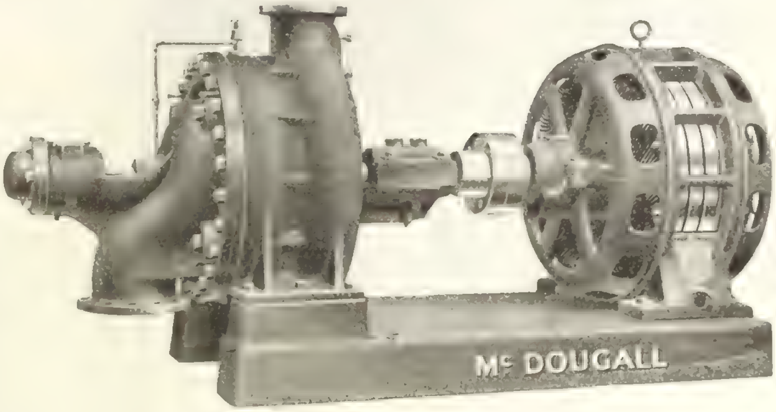
Tenders called for bridge, $5,000. Owner, County of Brantford. A. E. Watts, clerk, Court House, Brantford; engineer, W. H. Fairchild, Brantford. One 75-ft. span, width 16 feet, arch 18 inches at crown, rise 10 feet, abutments run back 20 feet, 9 feet high at front, 2 feet at back, wing walls extend back 25 feet from face of abutment, cement furnished by county. Plans, etc., at Clerk's office, Brantford. Tenders received until July 15th, by Wm. Milmine, Chairman Bridge Vommittee, until noon July 15th. Alternate tender calls for abutments, centre pier and two reinforced concrete girders, each having a clear span of 40 feet. Pier 25 feet long, 6 feet at base, 17½ feet high, two abutments 7 feet at base, 22 feet high, wing walls 24 feet at one end of bridge and 13 feet and 20 feet at other. Expanded metal for boor, reinforcement and Kahn bars for girders. Cement supplied by county.

Worthington Turbine Pumps
for Fire Service

Special Fire Pump

Capacity 1,000 imp. gals or 1,200 U. S. gals. per minute against 110 lbs. Motor 225 H. P. at 1186 r. p. m. For other illustrations see our

New Bulletin 109



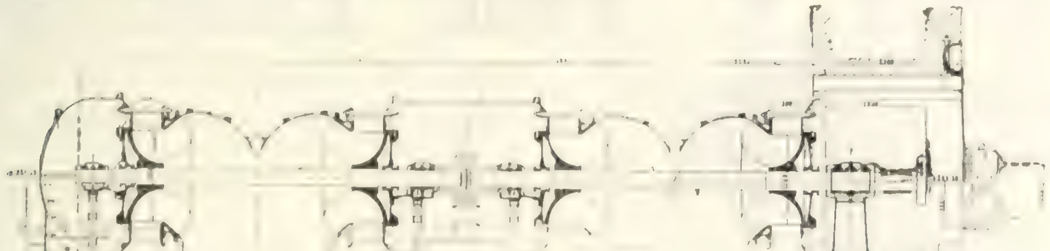
THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.
LIMITED

WORKS:
512 William St., MONTREAL

OFFICES:
MONTREAL, TORONTO, WINNIPEG, VANCOUVER

WATER-POWER PLANTS LOW PRESSURE TURBINES

Any Output. 5,000 Turbines Supplied. 2,000,000 Horse Power.



26 ft. Head. 5,000 H. P.
Four Units as illustration on order for the German-Swiss Water Power Company

ESCHER WYSS & CO. - ZURICH, SWITZERLAND

CANADIAN HEAD OFFICE, 408 LUMSDEN BUILDING, TORONTO
PHONE, ADELAIDE 234

When you think of Metal Ceilings think of GALT

A Contractor needs our Metal Ceilings—Because they can be erected

By ANY Carpenter
At ANY Time of the Year
In ANY Kind of Weather

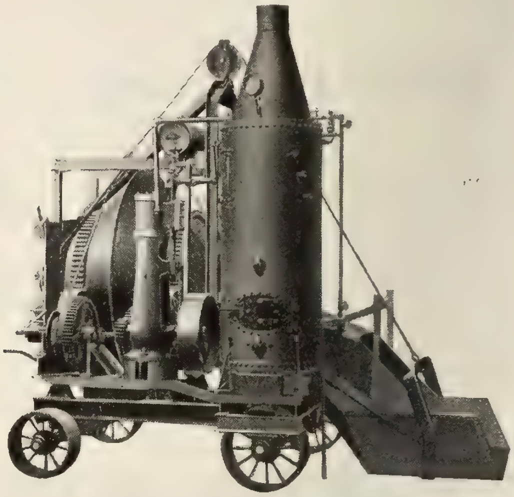
Plans, Instructions, Wood Bracket and Nails Furnished Free.

Get Catalogue A-3

THE GALT ART METAL CO., LIMITED
GALT, ONTARIO

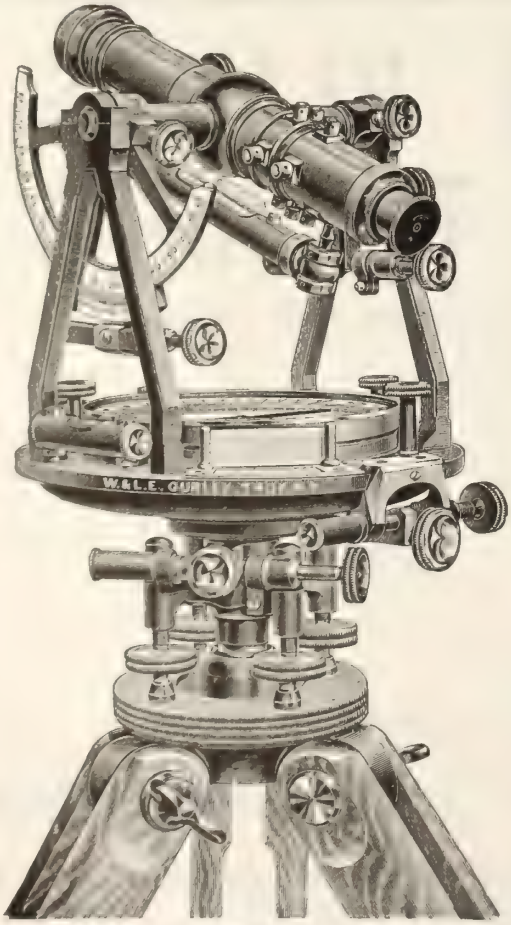
The Foote Concrete Mixe

The design and construction of
this machine will appeal to
the careful buyer.



No. 6 End-discharge

The General Machinery Co., Ltd.
526-7 Traders Bank Building
TORONTO, ONT.



1845 1911

W. & L. E. Gurley
TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic
Engineers and Land Surveyors

Transits
Y Levels
Compasses
Plane Tables
Current Meters
Levelling Rods
Chains
Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

"A little fore-talk may save much after-talk in building—it is wisest to install the best first."
—The Philosopher o' Metal Town.

Specify in the Contract

"Metallic"

Ceilings and Walls

When your specifications read "Metallic Ceilings and Walls", you are doing more than simply erecting a building — you are insuring **absolute satisfaction** for all parties concerned.

"Metallic" Ceilings and Walls are made of superior quality sheet steel—fit accurately, are durable and never sag, crack or fall off.

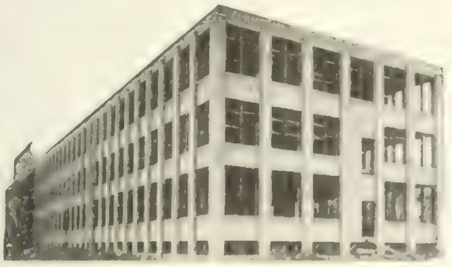
The exclusive patterns are varied and extensive, beautiful in design and very heavily embossed.

Our booklet, "Interior Decoration in Metal," will interest you. Write for it, also our new catalogue, No. 70—it contains valuable information on Metallic Building Materials.

Manufacturers 1952

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

CONTRACTORS



The Grand Rapids Refrigerator Plant Main Building — entire plant of 15 buildings cover 6 acres. A fine evidence of the accuracy and correctness of Ideal Blocks. Moreover, actual figures show that factory was built at saving of 30 per cent over common brick at $6.50 per thousand.

This shows you contractors the possibilities of

"IDEAL" FACE DOWN CONCRETE MACHINES

You can compete on quality and appearance, and you can get the contract every time on price. Make your bids on stone and brick, according to specifications, but also put in a bid of your own on "Ideal" Concrete Blocks.

Our Catalogues explain the machines in detail the work they do—and the money they are making for every Contractor and Builder using them. Write for your copy.

IDEAL CONCRETE MACHINERY CO., LIMITED.
Dept. B., LONDON, ONTARIO

We can also supply Concrete Mixers, Ornamental Molds, Tile Molds, Fence Post Molds, Dimension Stone Machines, Concrete Water Proofing, etc.

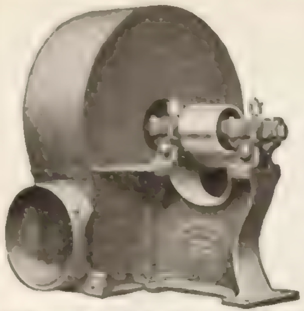
Reliable and Energetic Agents wanted in every Locality.

BRYAN DOORS

Noted for their Beauty and Durability

Send us your specifications for quotations

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario



Sturtevant

Stock Fans

Embrace such a diversity of types and sizes that nearly any ordinary conditions of fan engineering may be met by a fan shipped from stock.

Spare parts always ready for immediate shipment.

STURTEVANT Engineers suggest and recommend apparatus to meet requirements. ASK THEM. 863

B. F. STURTEVANT, Hyde Park, Mass.

Polson Iron Works Ltd., Toronto   Eadie-Douglas Ltd., Montreal

---

Fred Holmes, President   C. P. Holmes, Sec'y-Treas.

Telephone North 663

Fred Holmes & Sons

Limited

Building Contractors

1113 Yonge St., Toronto

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

What Lime do you use?

Renfrew?

If you don't you are missing an opportunity of saving 75 cents a day on each bricklayer, and of laying 200 more bricks a day.

'Renfrew' Lime requires less time for tempering. Does not set so rapidly and allows the bricklayer to spread for some more bricks.

'Renfrew' the Lime of Quality

Jamieson Lime Co.

RENFREW, ONTARIO

White Lime - Stone - Grey Lime
Brick - Drain Tile

Everything in Lumber for the Contractor

Fir, Hemlock, Spruce, Pine and Oak Timber and Lumber

We specialize in

Southern Pine Timber and Piles

10,000 Green Tamarac Piles for Immediate Shipment. Get our Prices.

THE ELMITT LUMBER CO. LIMITED, OTTAWA, ONT.

Armstrong

CRANES

Built for Every Service
up to 75 tons capacity

Electric Traveling Cranes, Standard
Electric Traveling Cranes, Special
Electric Gantry Cranes
Electric Jib Cranes
Hand Operated Cranes
Locomotive Cranes
Hydraulic Cranes

H. J. ARMSTRONG

Engineer and Manufacturer

Markdale, Ont., Can.

Producers of the Celebrated

"Peerless" Bedford Stone

Bedford Indiana Limestone

Mill Blocks
Sawed Planed and Turned Stone

W. McMILLAN & SON
(Incorporated)

General Offices
Chamber of Commerce Building
CHICAGO, ILL.

Quarries and Mills { Bedford, Ind.
Bloomington, Ind.

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material best grades of malleable iron and steel Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot lift styles. Adapted to all classes of work where a lifting jack can be used Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

Manufactured by

H. & E. Lifting Jack Company

Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal

Ritchie Contracting & Supply Co.,
Limited
7th Floor Bower Building, 543 Granville Street,
VANCOUVER, B.C.

Manufacturers and Dealers in Building Materials and Contractors' Supplies

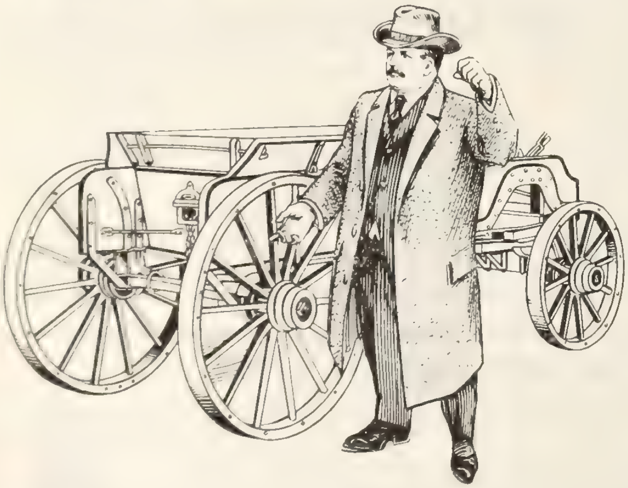
We carry in stock **Ransome Concrete Mixers** and parts.

AGENTS FOR :—**Hart-Ottis Convertable Cars**
Davenport Locomotives
McCully Rock Crushers
Marion Steam Shovels
The Dominion Wire Rope

Write, phone, or call for prices and catalogues.

Our aim, prompt delivery.

Jim Fellowes Talk:



Building dump wagons by the thousand, as they do in the WATSON plant, instead of by the dozen or hundred, brings about some interesting things.

In the first place the character of a WATSON wagon and the prices the WATSON people pay for materials makes it worth while for any spoke rim or lumber man to select his finest stock and offer it. And they do just that. The toughest spokes for wheels, and the finest birch for bodies, is chosen.

Now I don't claim that the man who buys WATSON'S dosen't have to pay for these things. He does.

BUT—he pays from twenty to forty dollars LESS, per wagon, possibly, than he would have to pay if the *same materials* and workmanship were used by a small factory and with "one horse" methods of purchase and manufacture. You get the idea?

Now this is just the one reason why more contractors by many thousand, are using the WATSON bottom dumping wagons than any other wagon.

I've got some printed matter that you might like. Just address JIM FELLOWS, Canastota, N. Y.

Watson Wagon Company, Canastota, N.Y.

The First Builders of Bottom Dumping Wagons

BRANCH OFFICES:
256 Broadway, New York, N.Y. 604 Witherspoon Bldg., Philadelphia, Pa. 806 Renshaw Bldg., Pittsburg, Pa.

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

---

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

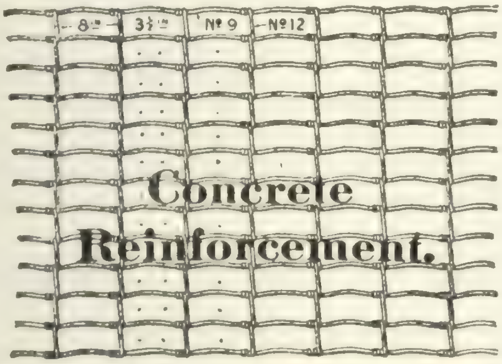
Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Concrete Reinforcement

In 3½ ft. Rolled Units

Page Concrete Reinforcement with a 3½ x 8 mesh, and running wires of 2,200 lb. tensile strength is used on the Harbour Commission Elevator, Montreal, Soulanges Canal, etc. It replaced on the Chambly Dam reconstruction on the Richelieu, a reinforcing that failed, although of large reputaton. This is proof of its quality. It really reinforces concrete work under heavy stresses.

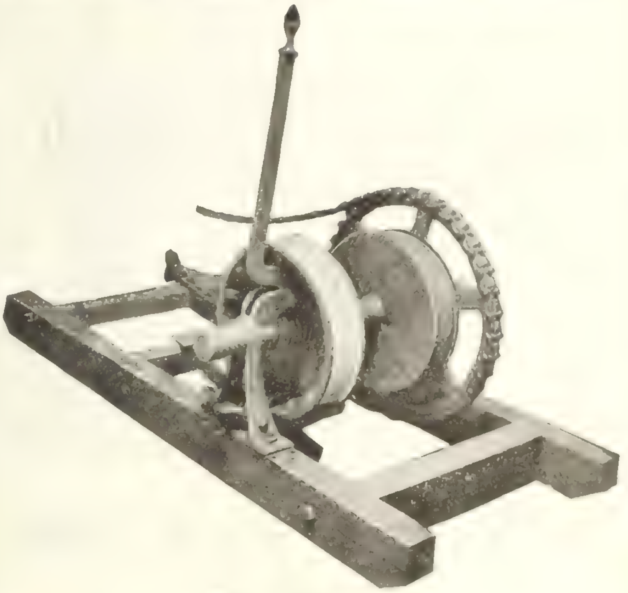


Put up in rolls for easy transportation. Running wires of high carbon steel, not bent or kinked, and of full strength. For adaptable and safe reinforcing of concrete, in dam, retaining wall, and bridge work, factory and foundation work, etc.

PARTICULARS, QUOTATIONS AND SAMPLE ON REQUEST.

Page Wire Fence Company, Limited
Walkerville, Ont.
Toronto Montreal St. John

DO YOU WANT A GOOD HOIST?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work **Mortar Conveying** **Well Digging**
Bridge Building **Sewer Building** **Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists London, Canada

The Carey Roof Standard
CAREY'S FLEXIBLE CEMENT ROOFING

TO PROVE TO YOU the high, standardized construction and composition of Carey's Roofing, we want to send you Booklet and Sample Free, and give you practical information regarding Carey's Roofing based on 25 years' actual time proved tests. Carey's Roofing is equally adapted to flat or steep surfaces, wood sheathing, tile or concrete. Whether your contract is large or small, we want to show you the advantage of using a standardized roofing material. The Philip Carey Mfg. Co., 60 Wayne Ave. Cincinnati, O. 50 Branches.

"FAMOUS FOR DURABILITY"

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President
Thos. C. Irving Jr., Vice-Pres.
Jas. W. [illegible], Secretary
Chas. Warnock, Treas. & Mgr.

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, Canadian Express Bldg., Montreal, Que.
Branch Offices, Traders Bank Building, Toronto, Ont.
Norfolk House, Laurence Pountney Hill, London, E.C.

Orleans Filtration Plant and Concrete Building taking about 100,000 barre of Alsen's New Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

for concrete reinforcement is made from high carbon, cold drawn wire. The process of cold drawing eliminates the possibility of flaws. Perfection Wire Mesh is necessarily perfect.

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

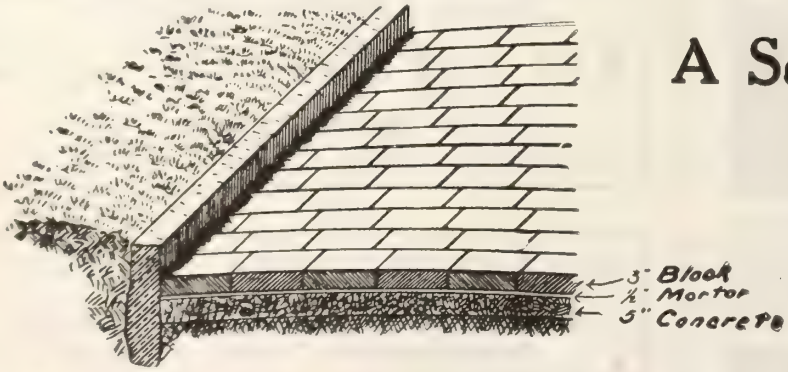
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

for Highest Efficiency, Absolute Reliability, Greatest Economy

**Used by the Largest Mining Companies and Hydro-Electric Plants.
Also Extensively for Dredging, Exhaust Steam, Compressed Air, etc.**

Sizes 3 to 42″ Diameter up to ½″ in thickness

Easily installed and securely connected with our Forged Steel Flanges or All Steel Bolted Joints.

Write for our Catalogue 5 A and prices on your requirements

AMERICAN SPIRAL PIPE WORKS - MAIN OFFICE—CHICAGO
NEW YORK OFFICE 50 Church Street

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)
"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."

W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, [illegible]

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.
1032 Garfield Building, CLEVELAND, OHIO
SELLING AGENTS
The Dominion Equipment & Supply Co., Winnipeg, Canada

Specify

Guelph Hydrated Lime

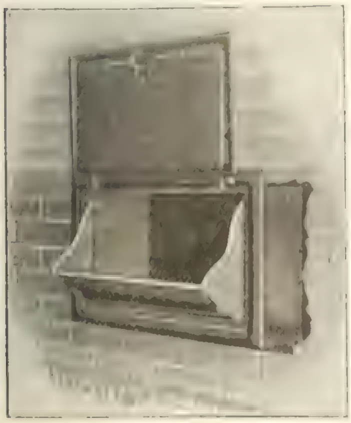
You will save dollars if you use this brand in place of ordinary lime.

It's less trouble
Costs Less
Goes Further
Works Easier
More Convenient

And a hundred other reasons that you can discover by using it.

Specify **Guelph Hydrated Lime** when ordering from your dealer.

Standard White Lime Co.
Guelph, Ontario

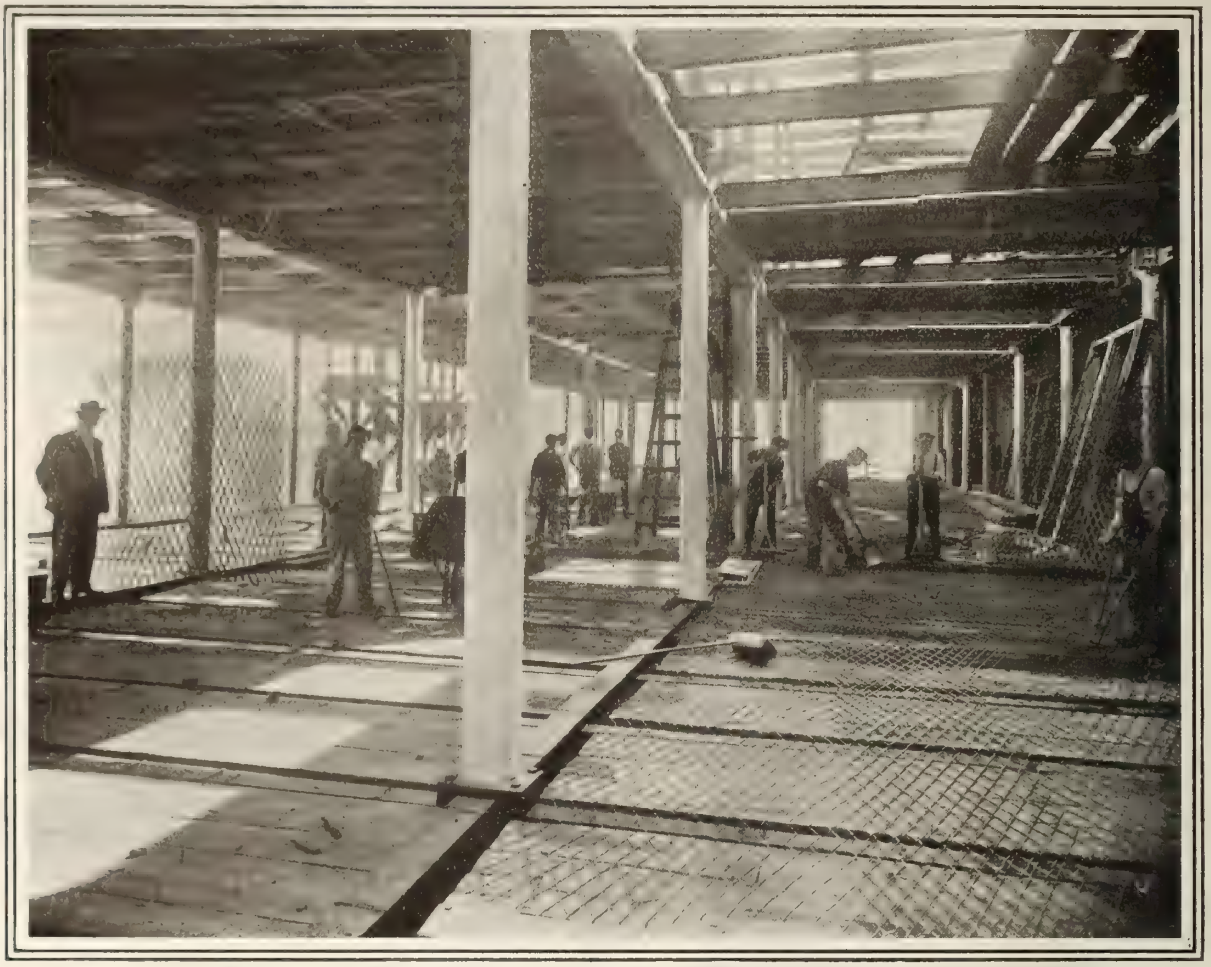


EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3 33 x 22 x 18

[illegible]

The Down Draft Furnace Co., Limited
Galt, Ontario, Can.
Montreal Representative: E. F. Dartnell, No. 8 Beaver Hall Square.



Placing EXPANDED METAL in one of Toronto's newest and most modern fire-proof factories—the new 14-storey building of The T. Eaton Co., Ltd.

Why EXPANDED METAL Remains the World's Standard Reinforcement

Expanded Metal reinforces a concrete slab in **all directions,** without wiring or cross-bonding.

Expanded Metal with its rough, twisted strands, diamond meshes and stronger-than-welded joints, furnishes a **bond** or **anchorage** theoretically and practically perfect.

Expanded Metal strands are **flat** and **straight,** not wavy and winding—hence no "straightening out" ensues when form-work is removed.

Expanded Metal—unlike rods—when once placed is not easily disaranged. The position computed for it by the engineer is assumed and kept.

Expanded Metal is not only **cheaper** and **simpler to use** than any other reinforcement, but, taken point for point, incomparably more efficient. Do not fail to consult us about your reinforced-concrete problems.

Large, illustrated Catalogue explaning the "STEELCRETE" System just off the press. You should have a copy.

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE—FRASER AVENUE

MONTREAL
138 CRAIG STREET WEST

St. John—13 Germain St.
Quebec—153 St Paul St.
Ottawa—83 Banks St.
Regina—Black Block

Fort William—113 N. May St.
Winnipeg—334 Garry St.
Calgary—309-8th Avenue.
Vancouver—416 Pacific Bldg.

IRON STAIRS

Dennis Wire & Iron Works Co.
London, Canada Limited
Toronto Offices - 12 QUEEN STREET E.

Cut shows a Brown Hoist Locomotive Crane at work on the New York Catskill Aqueduct. This crane is doing the excavating; placing the forms; handling the concrete in tubs; and covering up, besides the other miscellaneous work. *Catalogues are sent on request.*

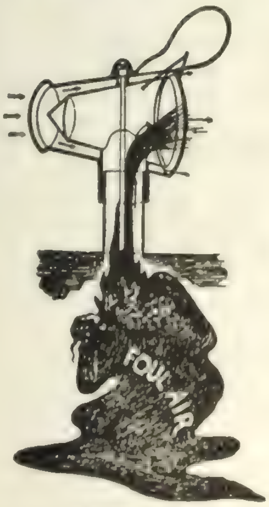
THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND, OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City

---

AUTOFORCE VENTILATING SYSTEM

PURE AIR

Positively No Down Draft



(Patented)
Autoforce Air Pump Ventilator

Write us for full Particulars

No fixed charges, power or repair bills. Requires no oil and is absolutely noiseless.

Unsurpassed for ventilation of Schools, Churches, Theatres, Offices, Work Rooms or for Chimneys with poor draft.

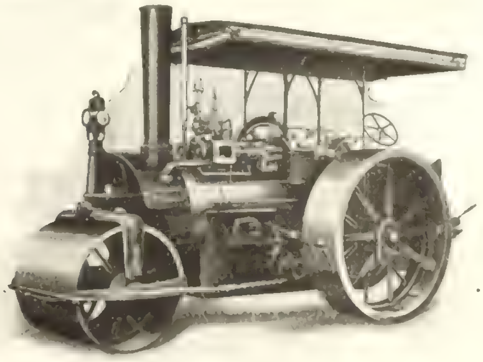
THE FORCE DRAFT is obtained by natural laws in its construction for the removal of impure air, securing perfect ventilation and preventing the entrance of objectionable matter. Expensive appliances, heretofore used to produce a draft, are not required.

SOLE LICENSEES AND MANUFACTURERS FOR CANADA

Gardiner & Gaskill, 505 Power Bldg.
Montreal, Que.

Telephone Main 159

"A Canadian Roller
for Canadian Roads"



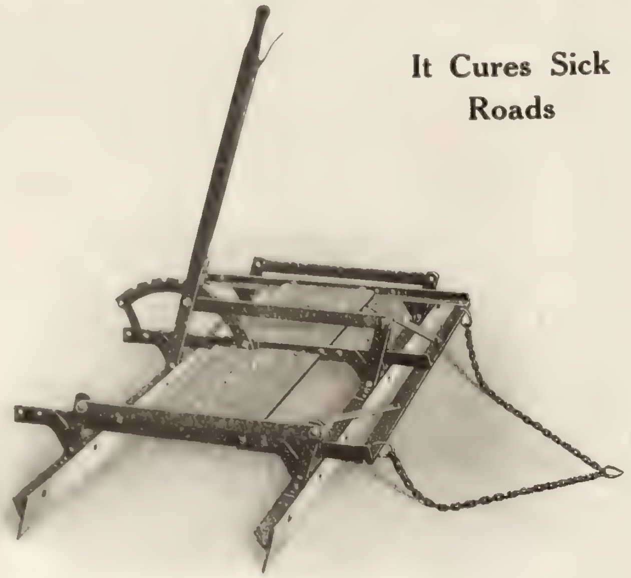
THE WATEROUS
DOUBLE CYLINDER
STEAM ROLLER

is built essentially to suit Canadian road building conditions. Over 100 Rollers in use in Canada to-day are proving their ability as road makers of the highest quality. A greater rolling capacity, with less cost of maintenance and operation, are its distinguishing characteristics.

The Waterous Engine Works Co.
BRANTFORD, CANADA Limited

Agent: Hugh Cameron & Co., 72 Queen St. E., Toronto, Ont

Abrico Road Drag No. 1



It Cures Sick
Roads

Patented April 28, 1908

Length 8 feet. Width between blades 30 inches.
Blades 6 inches. Weight 300 pounds.

Do you want nice smooth roads?

This Drag will take out all of the **bumps** and fill up all the **ruts.**

It is of steel construction and is adjustable, both forward and backward, and can be operated by one man and team.

Do not let distance keep you from having one.

Your order by mail will be given careful attention.

Manufactured by

Attica Bridge Company

Attica, Indiana, U. S. A.

Canadian Representatives desired. Write for special terms.

EVERY CONCRETE STRUCTURE

should be treated with a Waterproofing Compound for its proper protection

HERCULES

Waterproofing and Strengthening

COMPOUND

Fulfills the Requirements of a Perfect
Waterproofing for Concrete

HERCULES COMPOUND increases the strength of the mortar.
HERCULES COMPOUND waterproofs the concrete.
HERCULES COMPOUND does not effect setting of the cement.
HERCULES COMPOUND prevents corrosion of reinforcing by keeping it dry.

MANUFACTURED IN POWDER AND LIQUID FORMS

Send for Our Book of Tests by Prominent Engineers.

The Hercules Waterproof Cement Company

BUFFALO, N. Y., U. S. A.

A Kankakee Job Tells a Story

Kankakee, Ills.
Sept. 17th, 1910.

Gentlemen.

I send you a card showing your dump box being hoisted up to the third floor of this Court House teamsterand 1100 bricks.

A. SOUPAIT, Supt.

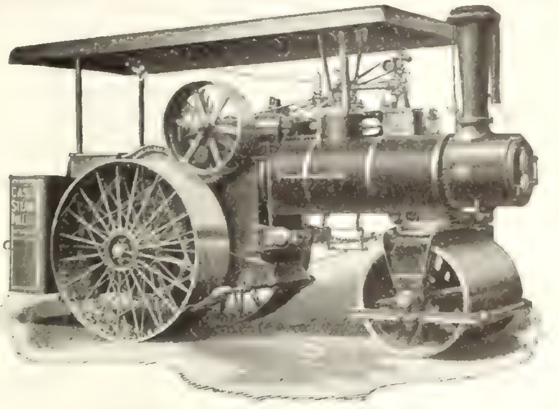
You may not want to use a dump box as a dump bucket. But if you are looking for a box that is strong and easy to handle, here's the best evidence in the world about the TROY. *And the price is Right.*

Get Bulletin 2.

The Troy Wagon Works Co.

N. Market St., Troy, Ohio.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300

F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.

Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.

Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT

THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18″ x 26″ cylinder Mogul, Standard Gauge, and 18-10″ x 14″ Vulcan and Davenport dinkeys, 36″ Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36″ Gauge. 10 - 60,000 lb. capacity Flat Cars.' 1 year old. All in good repair.
DRILLS	1 5-5/8″ Keystone Drill and Boiler ; 2 Cyclone Drills.
HOISTS & DERRICKS	2 Mundy and 3 Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	–Drag-Scrapers an 4—Wheel Scrapers.
MISCELLANEOUS	3–Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36″ Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW

May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED

St. James St. and Dolland Lane - - MONTREAL, CANADA

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A.

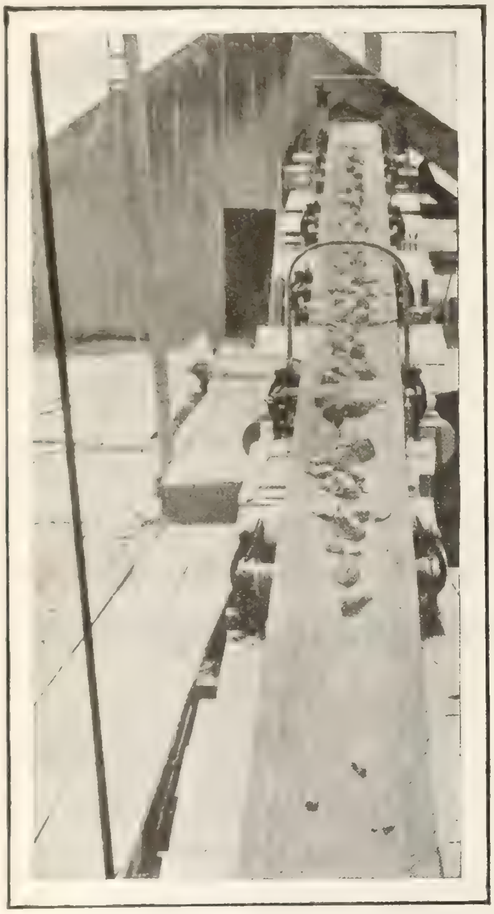
Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG



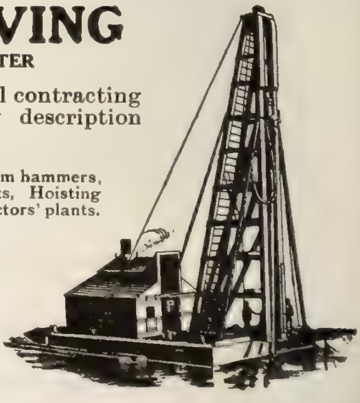
SCANDINAVIA
FEDERAL ENGINEERING & SUPPLIES LIMITED
TORONTO
BELTING

for Conveying Materials
Conditions may be WET or DRY

Federal Engineering & Supplies
Limited
Head Office, 284 Yonge Street, TORONTO
329 St. James Street, MONTREAL

THE
Thames Quarry Co.
St. Mary's, Ont.
CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.



PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

The
Missisquoi Marble Company
Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd.	Toronto, Ont.
C. N. Barclay	Winnipeg Man.
Bosse & Banks	Quebec, Que.
General Contractors Supply Company, Ltd.	Halifax, N. S.
129 Sparks Street	Ottawa, Ont.
James Robertson Co. Ltd.	St. John, N. B.
G. R. Duncan	Fort William, Ont.
Walker & Barnes	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd.	Vancouver, B. C.
315 Coristine Building	Montreal, Que.

Science of Metallurgy

GLENBOIG

Every Glenboig Brick bears the brand

GARTCOSH

Every Advance in the Quality of

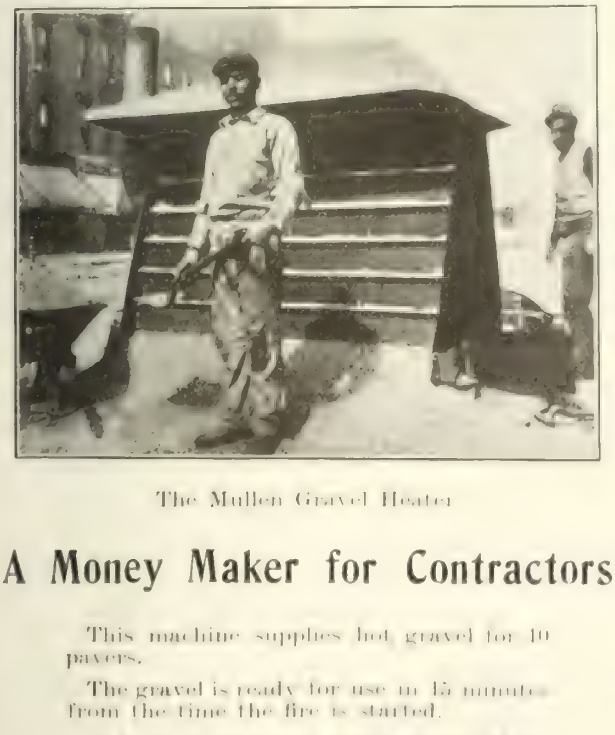
GLENBOIG
FIRE BRICKS

is an advance in the science of metallurgy.

Our literature contains information that you should have.

MAKER'S SELLING AGENT

Alexander Gibb
13 St. John St. - MONTREAL, Que.



The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another.

Tide Water Iron Works
HOBOKEN, N.J. U.S.A.

Come to Us If You Need

Hardwood Flooring
Interior Trim
Veneer Doors
Pine Doors
Stairs **Frames**
Sash, etc.

We manufacture the above from Select Stock : :

J. R. Eaton & Sons
Limited
Orillia, Ontario

Sand and Gravel

Lime	Fire Clay
Cement	Fire Brick
Plaster	Sewer Pipe
Hair	Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited

C.P.R. Crossing, Yonge St., North Toronto

Phones, Office North { 664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime

FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—

75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C.P.R., 355 Eastern Ave.

The Contractors' Supply Co., Limited

Manning Chambers, Toronto Tel. M. 6859

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG

WESTERN CANADA CONTRACTOR AND BUILDER'S GAZETTE

VANCOUVER

Builders' Supplies

JOHN GUNN & SONS

Contractors' Machinery

IF YOU REQUIRE BUILDERS IRON WORK CONSULT US

Western Iron Works

WINNIPEG

For rates and other particulars, write

Western Canada Contractor

Commercial Travellers Building - Winnipeg

CRUSHED

All Sizes

STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited

Head Office: **34 Yonge Street, TORONTO**

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.

Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches.......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES

(Installed in Toronto).

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite, 55 cents per square foot.
Viterous Tile—All sizes, according to color, 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

Standard compression work, 65 per cent.
High grade compression work, 60 per cent.
Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.
No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.
Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.
7 and 8-inch pipe, 50 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

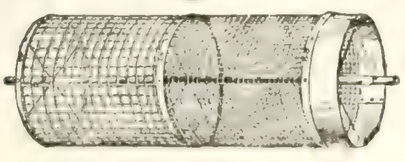
Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.
Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅝-inch, $1.45.
Binder stone, $1.30 per ton, f.o.b. Toronto.
Burnt River rubble stone delivered, $15 to $16 per toise.
Free stone delivered, $15 to $16 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.

PAINTS AND OILS

(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.
Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.
Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.
Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.
Turpentine, in barrels, 8cc per gallon.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.
Brown sills and heads, in the rough, delivered, 40 cents per foot.
Rubble stone in car lots, $1.30 per ton.

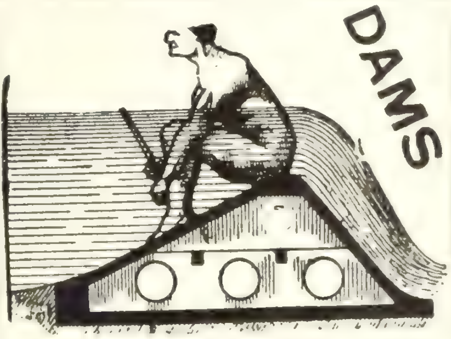
We manufacture
Revolving Screens



and anything in the screen line.
Also railings, wire guards, grills etc.
Electro-plating and all metal finishes.
Estimates Given - **Send for Catalogue**
Crescent Wire & Iron Works
Partridge & Sons **KINGSTON**

Bonds of Suretyship for Officers and Employees in positions of trust.
Bonds Bid and Supply in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies.
The
Guarantee Company of North America
The Pioneer Company *Established 1872*
Head Office - **Montreal**
Capital and Resources over - $1,965,000
Claims Paid over - - - $2,265,000
No Claims in Dispute
This Company is not a party to any premium tariff combination

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager. Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

DOMINION BRIDGE CO.
LIMITED

WE BUILD
BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF
Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS SUPPLIES

WATER WASHED SAND

OUR SPECIALTY

Dealers in
Sand and Gravel
Crushed Granite
Crushed Stone

SAND & SUPPLIES, LTD.
TORONTO

The

Phœnix Bridge & Iron Works Limited

MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

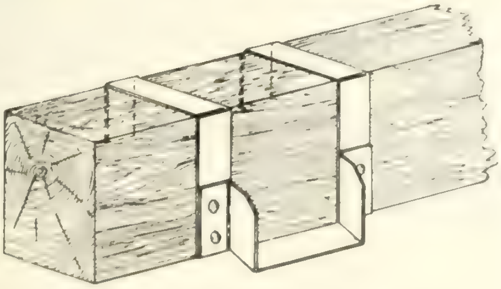
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

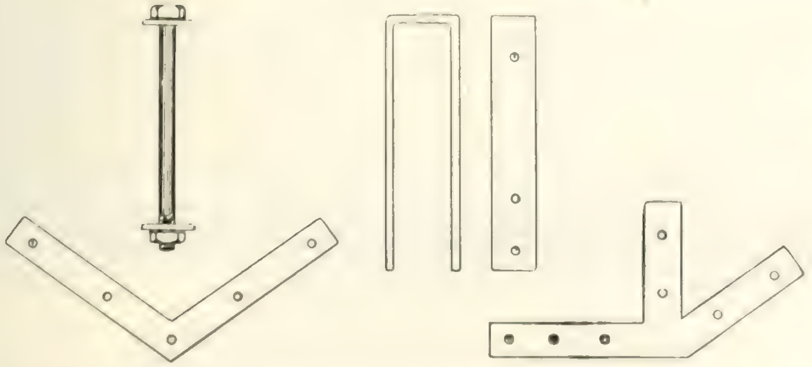
Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company, Ltd.

HAMILTON, ONT.



STEEL JOIST HANGERS, Single or Double



IRON FORGINGS, for Wooden Trusses, Apex Straps, Stirrups, Bolts and Rods made to order

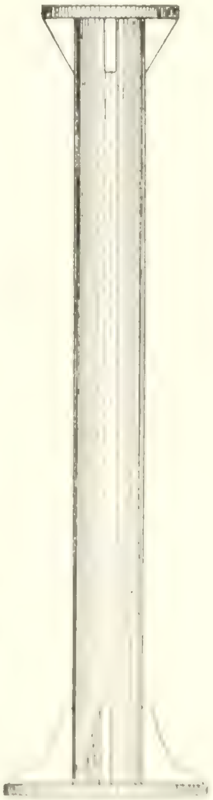
Beams,

Angles,

Channels,

Plates,

Any Size from 1½ inch to 24 inches, and any length up to 70 feet.



CAST IRON COLUMNS

all sizes and designs

S. S. SELMAN, President

A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O. BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President. J. G. Allan Vice-President. James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

CAST IRON PIPE

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments **Works and Offices: Ashbridge's Bay, TORONTO**

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS

CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, **Ottawa**

R. S. LEA and H. S. FERGUSON
ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street East, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.

A.M. Can. Soc. C.E. A.M. Am. Soc. C.E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply
Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 413, Pacific Block, **Vancouver, B. C.**

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { **Waterworks, Sewerage and Electric Lighting.**

Winnipeg and Calgary

John Haddin E. L. Miles

Allan Keefer

Architect

Ottawa, Ontario

Arthur L. Weeks

Architect

Canada Life Building, Ottawa

Reinforced concrete and steel structures. factories and commercial buildings

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes. "Roman" building stone. "Milton" pressed bricks. Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.
Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g. 224 St. James St. **Montreal**

Bell Tel. M. 4354

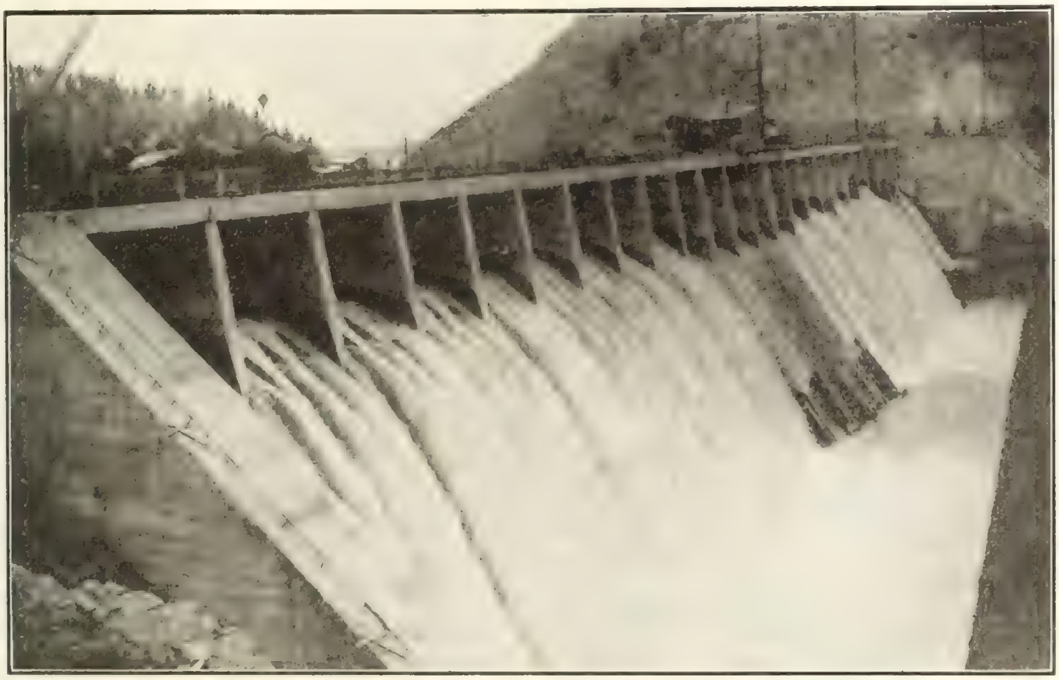
Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

THE FOUNDATION COMPANY
LIMITED
Bank of Ottawa Building - Montreal, Canada



WE MAKE A SPECIALTY OF

Water Power Construction
Power Plants, Dams

Our Scope

- BRIDGE PIERS,
- MINING SHAFTS,
- TUNNELS,
- WATER POWER CONSTRUCTION,
- POWER PLANTS
- SEAWALLS,
- WHARVES, QUAYS,
- DAMS,
- LIGHTHOUSES,
- HEAVY BUILDING FOUNDATIONS.

WITH A LARGE EQUIPMENT OF **PLANT** AND A WELL-ORGANIZED **FORCE** WE ARE PREPARED AT ALL TIMES TO UNDERTAKE DIFFICULT WORK ON THE SHORTEST NOTICE

We Invite Inquiries in Reference to Cost and Design of Difficult Foundation Work.

Barrett Specification Roofs

Anheuser-Busch Plant, St. Louis.
Roofing built by the
St. Louis Roofing Co.

Over 50 Years of Satisfaction

When big roofs are under consideration, ultimate costs are carefully figured. Barrett Specification Roofs win on the figures every time and for that reason most of the large manufacturing plants in the county carry roofs laid along the lines of this specification.

The enormous plant illustrated above is a typical instance. It is the Anheuser-Busch Brewery at St. Louis, covering 70 acres, equal to 35 city blocks. 99% of these buildings are roofed with coal tar pitch, tarred felt and gravel laid along the lines of the Barrett Specification, the other 1% being steep or ornamental roofs.

The durability of these roofs has averaged over 20 years and the net cost per square foot per year of service has been lower than that of any other roofing material.

The Anheuser-Busch people have had plenty of time to find a better and more economical roof covering if there was any, for they have been using gravel roofs of this type since 1852.

Whenever the area is large enough to set engineers and architects to looking up ultimate roofing costs, Barrett Specification Roofs are invariably used.

The Barrett Specification will be furnished free on request to anyone interested. Address our nearest office.

The Paterson Manufacturing Co., Limited

Montreal Toronto Winnipeg Vancouver St. John, N.B. Halifax, N.S.

Canada Wire & Cable Co., Ltd.

Announce the Opening of their New

Wire, Cable, and Wire Rope Works

at Toronto

The Product of our Electrical Wire Department will include

Electrical Wires and Cables

in Aluminum and Copper

BARE AND INSULATED—FOR ALL PURPOSES.
GALVANIZED IRON TELEGRAPH AND TELEPHONE WIRE

The Product of our Wire Rope Department will include :

- Standard Hoisting Ropes
- Semi-Pliable, Pliable and Extra Pliable Ropes
- Improved Patented Cruicible Cast Steel Hoisting Ropes
- Improved Mild Steel (Siemens-Martin) Elevator Ropes
- Transmission and Colliery Ropes
- Tiller Ropes
- Galvanized Steel Hawsers
- Galvanized Strand 2, 3 and 7 wire for Guys
- Ropes to any Standard Specification

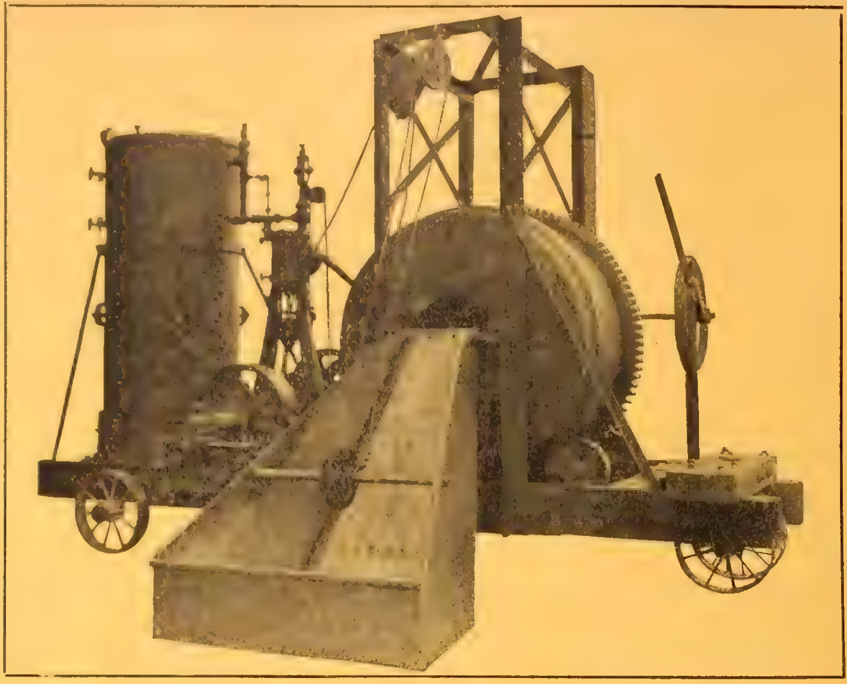
Literature ready for distribution at an early date. Write for it.

CANADA WIRE & CABLE CO.

LIMITED

Factory at
1170 Dundas Street
Toronto

HEAD OFFICE
KENT BUILDING, 156 YONGE STREET,
TORONTO



WHY should you buy a RANSOME?

When buying a Concrete Mixer

Its not the first cost

But the ultimate cost that counts

You can undoubtedly find many concrete mixers whose first cost is less than the Ransome—but is their ultimate cost less? That's the point.

You cannot afford to buy a machine that is not ever reliable, is not satisfactory in operation, is inefficient.

Our Ransome Mixer is the most reliable, efficient and durable mixer on the market. Simple in construction—repair bills are practically nil.

Considering quality and real value in Concrete Mixers—there is no cheaper machine on the market. All sizes in stock.

F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man. and Vancouver, B.C.

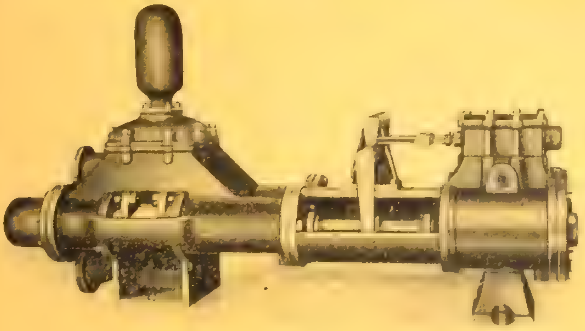
Vol. 25 Toronto, July 19, 1911 No. 29

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

We manufacture
Steam and Power Pumps, Condensers, Travelling Cranes, etc.



Write for Catalogue
The Smart-Turner Machine Company
HAMILTON, ONTARIO Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: 91 to 133 Don Roadway
TORONTO

"Dominion Crown"

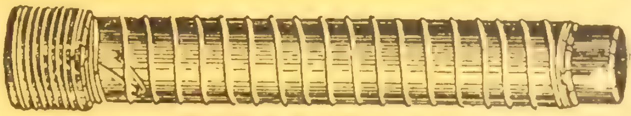
Canada Plates

Black and Galvanized

Superior Plates for Superior Work

Your Jobber can get them for you

A. C. Leslie & Co., Limited
Montreal



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS

for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

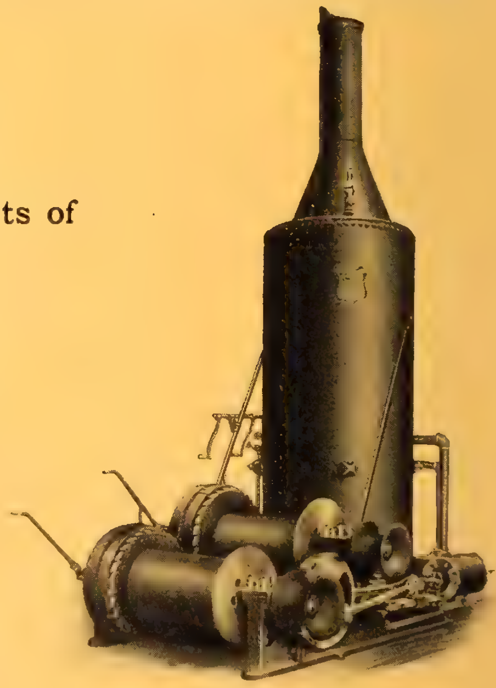
Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver



"AMERICAN"

Always meet the extraordinary requirements of

PILE DRIVING

Extra long drums—extra large boilers

ENGINES

Described in our Big Illustrated Catalogue. Write Dept. 6 for a copy.

AMERICAN HOIST & DERRICK CO.

St. Paul, U. S. A.

Gorman, Clancey & Grindley	Edmonton, and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot, Ltd.	Vancouver, B.C.
J. L. Neilson & Co.	Winnipeg, Man.
Dunn Brothers	Winnipeg, Man.
J. A. McTaggert	Winnipeg, Man.

Name

Address

Please send information and prices on "American" Pile Driving Engines

AMERICAN HOIST
& DERRICK CO
St. Paul, Minn.
C R. 7 19/11

When making specifications keep these facts in mind about Canada Cement

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

Remember

We guarantee **uniformity of strength, setting qualities, color,** and **fineness of grinding,** which must obtain if Concrete construction is to prove successful.

CANADA CEMENT COMPANY LIMITED
PORTLAND
CANADA
CEMENT
MONTREAL

Canada Cement Company, Ltd.

MONTREAL - TORONTO - WINNIPEG - CALGARY

CLAM SHELL BUCKETS

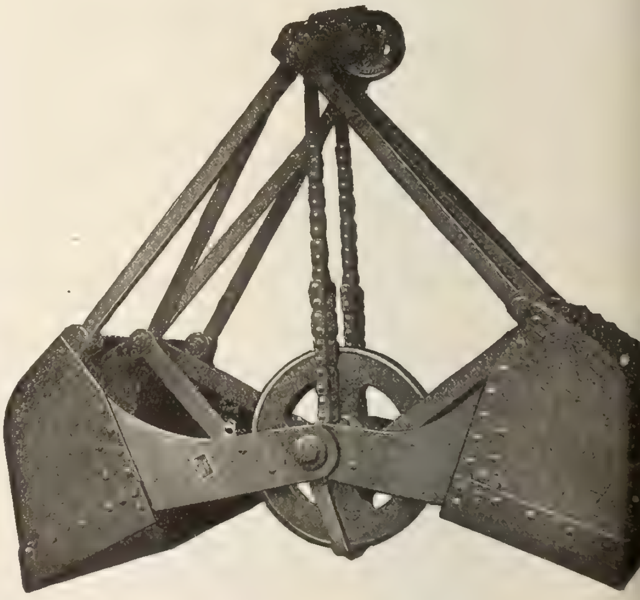
Hayward Buckets

Have the reputation for STRENGTH, DURABILITY, SPEED AND ECONOMY

We have Buckets for all kinds of material.

Tell us your proposition and we will recommend the proper outfit.

CATALOGUE ON REQUEST



Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

ORANGE PEEL BUCKETS

Hayward Orange Peels have Great Digging Power.

Multi - Power Buckets for Heavy Material.

SIZES

From 1 Cubic foot To 3 Cubic yards

We Design Special Excavating Outfits.

Our Engineering Department is at your disposal to solve any special conditions.

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects Page
[illegible] 88
[illegible] 88

Architectural Iron Work
Canada Wire Goods Mfg. Co. [illegible]
Dennis Wire & Iron Works 77
Meadows Co., Geo. B. [illegible]

Air Compressors
Escher Wyss & Co.

Air Valves, Automatic
Marsh, J. P. 82

Asphalt Plant
East Iron Machine Co. 73

Buckets
American Hoist & Derrick Co. 2
Sackett Screen & Shute Co. 70

Belting
Federal Engineering & Supplies, Ltd 80

Blowers
Sturtevant Co., B. F. 30

Boilers
Case Threshing Machine Co. 79
Inglis, John 65
Jenckes Machine Co. 2
Leonard & Sons, E. 73
Marsh & Henthorn 69
McDougall Caledonian Iron Works 67
Mussens Limited 4
Waterous Engine Works Co. 77

Brick Machinery and Supplies
Berg Mfg. Co.
Wert C. S.
Whitehead, John 29

Brick
American Enamelled Brick Co.
Don Valley Brick Works 7
Hamilton Pressed Brick Co. 17
Milton Pressed Brick Co. 78
Port Credit Pressed Brick Co. 86
Toronto Pressed Brick Co. 89

Brickmaker's Supplies
Sackett Screen & Shute Co. 70

Bridges (Steel)
Attica Bridge Co. 78
Canadian Bridge Co. 84
Cleveland Bridge Co. 84
Dickson Bridge Works
Dominion Bridge Co. 84
Hunter Bridge and Boiler Works 30
Phoenix Bridge and Iron Works 85
Pennsylvania Steel Co. 84

Cement
Alsen Portland Cement Co. 74
Britnell & Co. 80
Bremner, Alex 87
Canada Cement Co. 3
McNally & Co., W. 85
Morrison & Co., T. A. 88
Rogers, Alfred Limited 9

Concrete Pipe
Dominion Concrete Co. 22
Lock Joint Pipe Co. 26

Cement Waterproofing
Ceresit Waterproofing Co.
Hercules Waterproofing Cement Co
Mansbendel, F. P. 31

Cranes, Travelling & Locomotive
Page
American Hoist & Derrick Co. 2
Armstrong, H. J.
Brown Hoisting Machinery Co. 77
Males Co 62
Parker, S. E. 20
Willis Shaw Machinery Co 62

Conduits
Conduits Co., Limited 87

Crushed Stone and Granite
Sand and Supplies 85

Concrete Mixers and Machinery
Canada Foundry Co 20
Cropp Concrete Machinery Co 80
General Machinery Co.
Gould, Shapley & Muir 16
Hopkins & Co., F., H. 92
Ideal Concrete Machinery Co.
Jenckes Machine Co. 2
London Concrete Machinery Co. 35
Milwaukee Mixer Co. 16
Mussens Limited 4
Morrison & Co., T. A. 88
Steel and Radiation (Cement Gun) 23
Standard Scale 27
Vining Bros. 73
Wettlaufer Bros. 10
Wert C. S. 29

Contractors' Plant
American Hoist & Derrick Co. 2
Acme Eqpt. & Engineering Co. 75
Beatty & Sons, M. 6
Hepburn, John T. 12
H. & E. Lifting Jack Co.
Hopkins & Co., F. H. 92
International Marine Signal Co. 8
Willis Shaw Machinery Co. 62
Meaford Wheelbarrow Co. 78
Marsh & Henthorn 69
Montreal Locomotive Works 32
Mussens Limited 4
Parker, S. E. 20
Ritchie Contractors Supply Co.
Tiffin Wagon Co. 70
Troy Wagon Works 7
Watson Wagon Co 72
Wert C. S.

Crushers (Stone and Rock)
Berg Machinery Co.
Case Threshing Machine Co. 79
Hopkins & Co., F. H. 92
Jenckes Machine Co. 2
London Concrete Machinery Co. 35
Males Co. 62
Mussens Limited 4
Morrison & Co., T. A. 88
Willis Shaw Machinery Co. 62

Corrugated Iron
Galt Art Metal Co. 70
Metallic Roofing Co. 69
Metal Shingle and Siding Co.
Ormsby, A. B., Limited 11
Roofers Supply Co. 87

Contractors
Bennett, Robt.
Foundation Co.
Holmes, Fred.
McIlwraith, Jas. A. 88
Nadel & Adler 88
Wells & Gray

Coal Handling Apparatus
American Hoist & Derrick Co 2
Down Draft Furnace Co. 75
Parker, S. E. 20

Derricks and Derrick Fittings
American Hoist & Derrick Co. 2
Parker, S. E. 20

Drills Page
Beatty & Sons, M. 6
Canadian Rand Co.

Drilling Contractors
Harvey, J. 83

Dredges
Beatty & Sons, M. 6
Males Co. 62
Willis Shaw Machinery Co 62

Dry Kilns
Sturtevant Co., B. F. 30

Electrical Apparatus, Motors
Canada Ford Co. 36

Engines
Case Threshing Machine Co. 79
Canadian Boving Co. 29
Inglis, John 65
Jenckes Machine Co. 2
Leonard & Sons, E 73
Mussens Limited 4
Sturtevant Co., B. F. 30
Waterous Engine Works Co. 77

Engineers (Civil) and Mechanical
Barber & Young 88
Chipman & Power 88
Bowman & Connor 88
Farmer, John T. 88
Fuce, Edw. O. 88
Galt Engineering Co., John 88
Glaubitz, H. J. 88
Hancock, H. Syd. 88
Inglis, John 65
Kennedy, Jas. C. 88
Lea & Ferguson 88
Mace, T. Harry 88
Mitchell, C. H. 88
McRae, John B. 88
Moore & Scollan 88
Taylor, James 88

Exhaust Heads
Sturtevant Co., B. F. 30

Filters
American Water Softener Co. 89

Floor Scrapers
Hurley Machine Co. 30

Friction Clutches
Berg Machinery Co.

Field Instruments
Gurley, W. & L. E. 33

Fire Brick
Gibb, Alexander 81

Fire Apparatus
Morrison & Co. T. A. 88
Seagrave, W. E. 80

Fireproof Doors and Windows
Douglas Bros. 18
Mussens Limited 4
Ormsby, A. B. 11
Steel and Radiation 23

Gauges, Steam, etc.
Marsh, Jas. P. 82

Granite and Marble
Laurentian Granite Co. 83
Missisquoi Marble Co. 81
Smith Marble & Construction Co. 71

Glass Page
Consolidated Plate Glass Co. 69
Luxfer Prism Co. 9
Toronto Plate Glass Importing Co. 1

Hoists (Hand Gasoline and Electric)
Parker, S. E. 20

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. 73
Steel and Radiation 23

Hoisting Machinery
American Hoist & Derrick Co. 2
Beatty & Sons, M. 6
Canada Ford Co. 36
Inglis, John 65
Jenckes Machine Co. 2
Hopkins & Co., F. H. 92
London Gas Power Co. 73
Marsh & Henthorn 69
Mussens Limited 4
Parker, S. E. 20
Sturtevant Co., B. F. 30

High Pressure Pipe Lines
Escher Wyss & Co.

Hydrants
Canada Iron Corporation 87
Gartshore-Thomson Pipe Co. 86
Kerr Engine Co. 76

Interior Finish and Doors
Anglin, S. 74
Brennen & Sons, M. 30
Batts Limited 14
Canada Office & School Furniture Co 34
DeLaplante, Ltd. 81
Bryan Mfg. Co. 67
Eaton & Sons, J. R. 81
Georgian Bay Shook Mills
Rhodes Curry & Co. 73
Tillson Co. 19
Wilson Bros. 72

Locomotives
Montreal Locomotive Works 32

Lime
Christie, Henderson & Co. 82
Jamieson Lime Co.
Standard White Lime Co 75

Metal Lath
Galt Art Metal 68
Metallic Roofing Co. 69
Noble C. W. 74
Steel and Radiation 23

Meters
Hopkins & Co., F. H. 92
McDougall Caledonian Iron Works 67
Neptune Meter Co. 71

Paving and Paving Materials
Dominion Carbolineum Works 28
Metropolitan Paving Brick Co. 71
Ontario Asphalt Block Co. 74
Shawmut Paving Brick Co. 72
Silica Barytic Stone Co. of Ontario 83

(Continued on page 10)

M. Beatty & Sons, Limited Welland, Ontario, Canada

Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows
Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Engineers and Builders

OF ALL

Steel and Iron Structures

Mill Buildings our Specialty. Roofs, Bridges, Columns and Girders of Every Description. Large Stock of Structural Shapes always on hand for immediate shipment. Ask for Designs and Estimates on your Work.

International Marine Signal Company Limited

OTTAWA, CANADA

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Page
Albert Mfg. Co.	
Britnell & Co	82
[illegible] H W	86

Portable Saw

Canadian Fairbanks	41

Pipe

American Spiral Pipe Works	73
Canadian Pipe Co	86
Dominion Wood Pipe Co	12
Dominion Concrete Co	22
Gartshore-Thomson Pipe Co.	86
Lock Joint Pipe Co	26
[illegible] & Co	11
National Iron Works	87
Pacific Coast Pipe Co	1
Pedlar People	
Steel and Radiation	23

Plumbers' Supplies

Standard Ideal Co.	36

Power Engines

Inglis Co., John	65

Paints and Varnishes

Paterson Mfg. Co.	

Pile Driving Machinery

American Hoist & Derrick Co...	2
Lincoln Construction Co.	80

Pumps and Pumping Machinery

American Well Works	68
Beatty & Sons, M	6
Cook, A. D	89
Escher Wyss & Co.	
Hopkins & Co., F. H.	92
Inglis Co , John	65
Leonard & Sons, E	73
McDougall Caledonian Iron Works..	67
Mussens Limited	4
Ontario Wind Engine & Pump Co.	80
Smart-Turner Machine Co.	1
Waterous Engine Works Co	77

Roofing Materials

	Page
Asbestos Mfg. Co.	24
Galt Art Metal Co.	70
Metallic Roofing Co.	69
Metal Shingle & Siding Co.	
Noble, Clarence W	74
Paterson Mfg. Co.	
Philip Carey Co.	
Roofers Supply Co.	87
Standard Paint Co.	

Railway Supplies

Gartshore, John J.	88
Hopkins & Co., F. H.	92
Mussens Limited	4

Reinforcements, Concrete and Steel

Ambursen Hydraulic Construct'n Co.	89
Canada Wire Goods Mfg. Co.	70
Concrete Form Engine Co.	35
Steel Co. of Canada	19
Steel & Radiation	23
Trussed Concrete Steel Co	17
Turner, C. A. P.	72

Road Machinery

Case Threshing Machine Co..	79
Hamilton Machinery Co.	15
Morrison & Co., T. A	88
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co	20
Hopkins & Co., F. H	92
Montreal Locomotive Works	32
Mussens Limited..	4
Males Co.	62
Willis Shaw Machinery Co	62

Stone

	Page
Anderson, Geo	18
Britnell & Co.	82
Brodie, Jas.	34
Christie, Henderson & Co.	82
Consolidated Stone Co..	71
Contractors' Supply Co.	82
Corinthian Stone Co.	
Crushed Stone, Limited	73
Doolittle & Wilcox	87
Hagersville Contracting Co..	11
Laurentian Granite Co.	83
McMillan & Son, R.	
Morrison & Co., T. A.	88
Myers, Oakley	73
Roman Stone Co	13
Sackville Freestone Co.	8
Sand & Supplies	85
Thames Quarry Co.	80

Sand and Gravel

Rogers Supply Co.	31
Sand & Supplies	85

Steam Apparatus

Sturtevant Co., B. F.	30

Submarine Diver

Rouleau, Joseph N.,	88

Structural Iron and Steel

Dominion Bridge Co.	84
Steel Co. of Canada	19
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	89
Salter, W. H	85
Steel & Radiation	23

Sewer Pipe

Britnell & Co	82
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
GartshoreThomson Pipe Co..	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	26
National Iron Works	87
Ontario Sewer Pipe Co	21
Standard Drain Pipe Co.	21

Stationary and Power Engines

Case Threshing Machine Co	79

Slate

Roofers Supply Co.	87

Steel Shingles and Ceilings

Galt Art Metal Co.	70

Smoke Stacks

Leonard & Son, E.	73

Tents

Woods Limited	25

Safes and Vaults

Taylor, J & J	70

Testing and Inspection Bureau

	Page
Hunt & Co., Robt. W	73

Tiles

Smith Marble & Construction Co.,	71

Tanks and Stand Pipes

Berg Machinery Co.	
Inglis, John	65
Jenckes Machine Co.	2
Leonard & Sons, E.	73
Marsh & Henthorn	69
McDougall Caledonian Iron Works..	67
Ontario Wind Engine & Pump Co.	80

Trade Journals

Castellanos A. W.	80

Valves

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co..	86
Kerr Engine Co.	76
Marsh & Co, Jas	84

Ventilating and Heating Apparatus

Sturtevant Co., B. F.	30

Water Softeners and Filters

Berg Machinery Co.	
American Water Softener	89

Wire Rope

Greening Wire Co., B..	67
Smith, Thos. & Wm	
Steel Co. of Canada	19

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	72
Crescent Wire Iron Works.	83
Greening Wire Co B	67
Sackett Screen & Shute Co	70
Steel and Radiation	23

Water Wheels

McDougall Caledonian Iron Works	67
Canadian Boving Co.	29

Water Turbines

Escher Wyss & Co.	

Wheelbarrows

Sackett Screen & Shute Co.	70
Meadford Wheelbarrow Co.	78
Parker, S. E	20

FOR SIDEWALK WORK

The mixer illustrated here cannot be beaten. It is light, mixes the material quickly, and is easily moved. Equipped with left hopper filling drum and gasoline power and traction.

If you are interested in any kind of concrete machinery send for our illustrated catalogue.

Wettlaufer Bros.
178 Spadina Ave.
TORONTO

A. R. Williams Machinery Co.,
15 Dock St., St. John, N. B.
W.E. Ransome, Moose Jaw, Sask.

MUNDERLOH & Co. Ld. MONTREAL.

SEAMLESS STEEL TRACTION AND LIGHTING POLES.

Mannesmann Seamless Steel Pipes. For Gas & Water Mains.

In Lengths up to 40 Feet.

An Improvement on Cast Iron.

All Pipes Tested 75 Atmospheres Before Leaving Works.

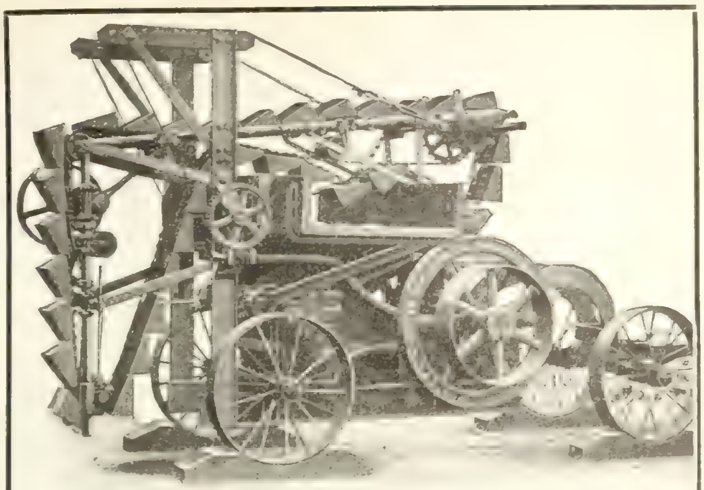
Write us for Illustrated Booklet.

SEND US YOUR ENQUIRIES.

WE ARE SOLE AGENTS IN CANADA FOR—

MANNESMANN TUBES.

FOR ALL PURPOSES.



Steel Castings and No Lost Motion

forged steel yoke, cross bars on yoke remove all strains from main frame, moving jaw given a compound oscillating and reciprocating motion so that crushing is **continuous**, are features of the

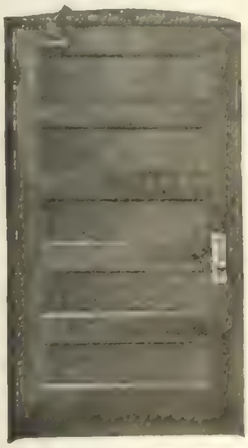
Aurora Steel Rock Crusher

Its compact form combines great strength with light weight, making it very portable, and **specially adapted for contractors' use.** Strongest and most durable crusher on the market combining maximum product with minimum power. Adjustable to various sized stone. *Get our Special Crusher Catalo*

Western Wheeled Scraper Co.

AURORA, ILL.

You Want to Specify A Door That Will Back You Up



When our **Kalameined Clad Doors** are specified they live up to anything good the Architect or Contractor may have said for them. You do not have to apologize for any bulging between the wood and the iron, for any seams or nail heads showing, for anything not uniform, because *everything* is right. We would not let them out of our factories any other way. We have a reputation to sustain. *Specify The Ormsby Underwriters and get satisfaction.*

A. B. Ormsby, Limited

Experts in Fireproof Windows and Doors

Factories: - - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

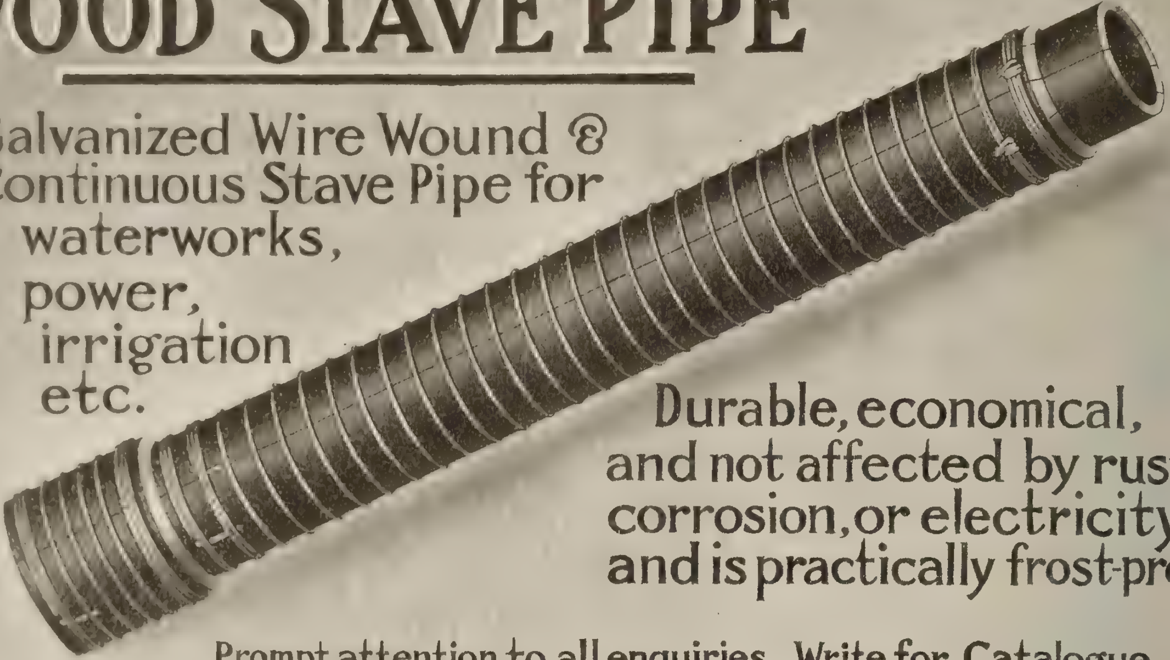
SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



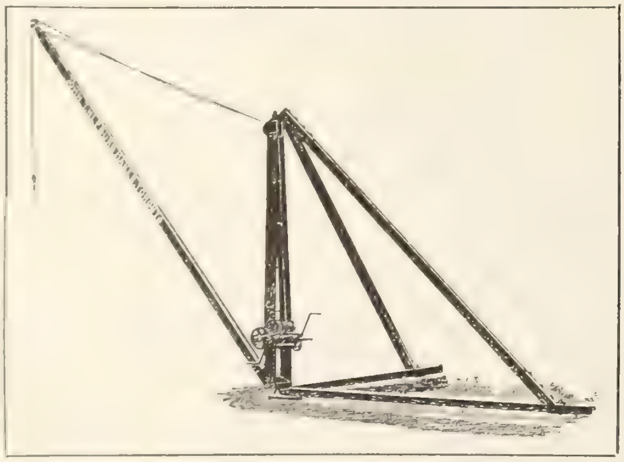
Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

A Saving of Time and Labour

Time is Money. Labour costs Money. Anything that means saving of Time and Money is well worth looking into.



Hepburn
Scotch Derricks

effect a Labour Saving of fully 50 per cent. over the old style derrick—with greatly increased efficiency.

Increased efficiency and reduced operating cost, means more work and better work in less time and with less labour—means greater capacity—more business—larger margin of profit.

We make "Efficient" Derricks of all kinds and for all purposes.

Other use Hepburn Derricks because they find it pays to use the best. It will pay you too. Write to-day for particulars.

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

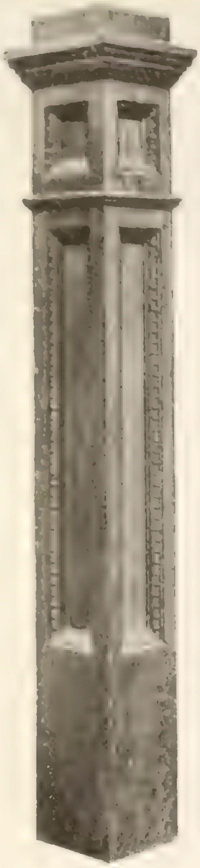
Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company

Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi, 26 Sparks St., Ottawa	A. L. Bedson, Canada Life Bldg., Winnipeg	T. A. Morrison & Co., 204 St. James St., Montreal



Newel Post
No. B.L. 206

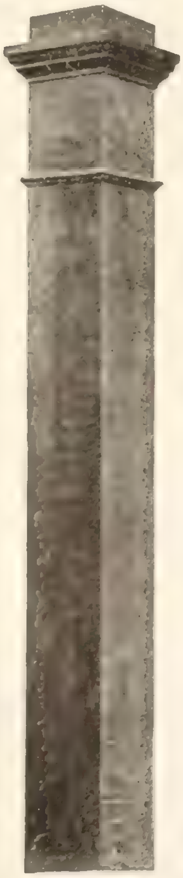
BATTS

Limited

FOR

Columns
Newel Posts
Doors
House Trim
Sash

Door No. B L 312



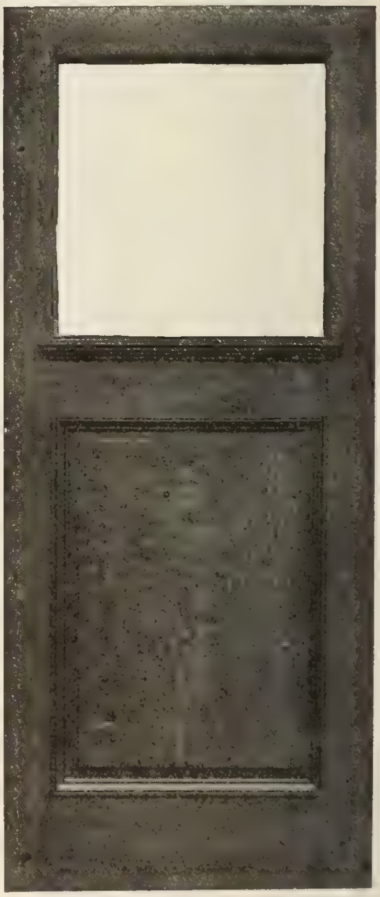
Newel Post
No B.L. 203

With our immense column department containing over 10,000 square feet of floor space and equipped with up-to-date machinery we are able to handle your orders promptly and properly. Our doors do not warp, sag or check.

We have a catalogue for you

Batts Limited

374 Pacific Ave., West Toronto



Door No. B. L. 310

'Champion' Road Machinery

Leads all Others

Good design will never compensate for structural weakness.

Structural strength will never make a poorly designed machine good.

It is only when Road Machinery is **right in every respect** that it can be trusted to do all that is expected of it under all conditions.

"Champion" Road Machinery leads all others because it has no weaknesses to offset its invaluable, exclusive features.

"CHAMPION" Rock Crushers
"CHAMPION" Graders
"CHAMPION" Sprinklers and Sweepers, etc.

have born the champion reputation for over 20 years. Write for the catalog before you buy—tell us which machine interests you and we will give full information.

Save 3 to 5 days on Repair Parts

Order all repair parts direct of the Hamilton Machinery Co., 144 York St., Hamilton. By sending direct you will save from 3 to 5 days in shipment of your order.

Manufactured by

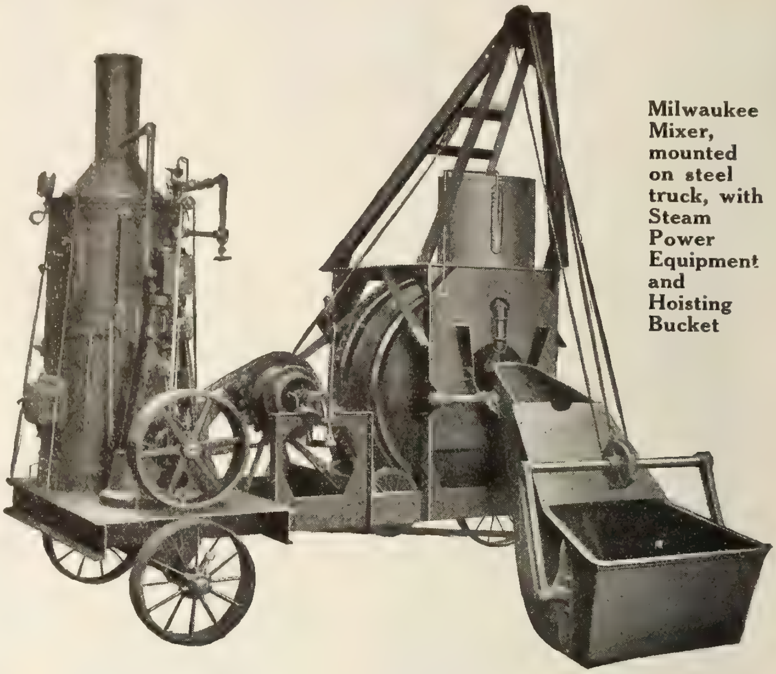
American Road Machine Co., of Canada, Limited
GODERICH, ONT.

THE HAMILTON MACHINERY CO., LIMITED, HAMILTON, ONT.

Sole Agents for the Above Company
Also Canadian Distributors for the famous Inter State Automobile.

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

We will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

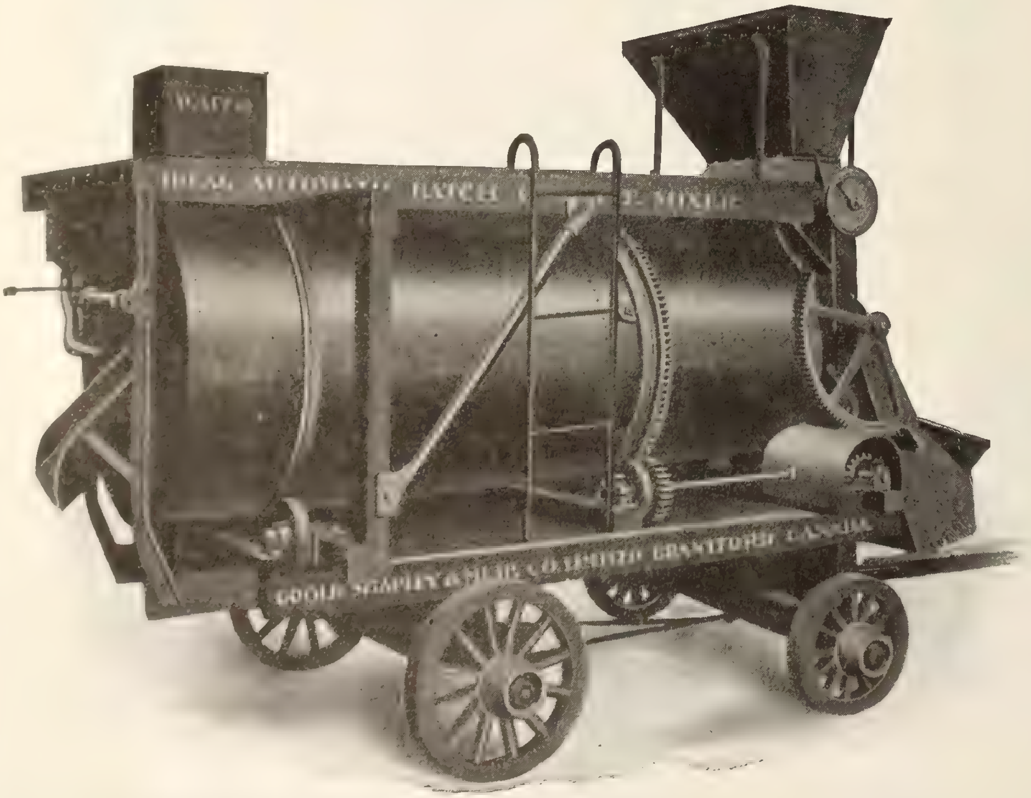
MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES.

The Stuart Machinery Co., Winnipeg, Man. **C. W. Stancliffe & Co., Vancouver, B. C.**
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS



Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

Tanks and Towers

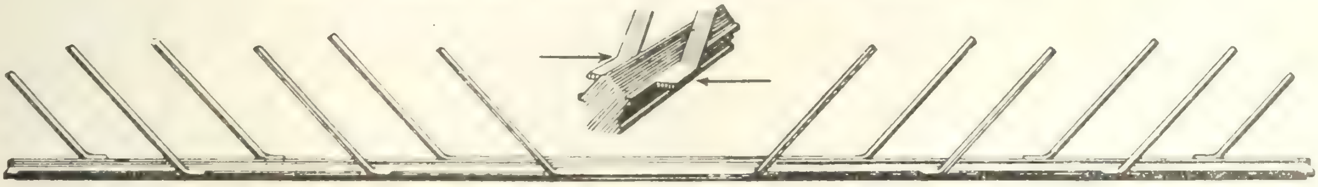
for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada

KAHN SYSTEM

OF REINFORCED CONCRETE



Note Rigid Connection of Shear Members

Flood Your Building
with Light by Using

United Steel Sash

It is fireproof, permanent, strong, rigid. You can increase the light and thereby increase the efficiency of your staff.

HY-RIB---

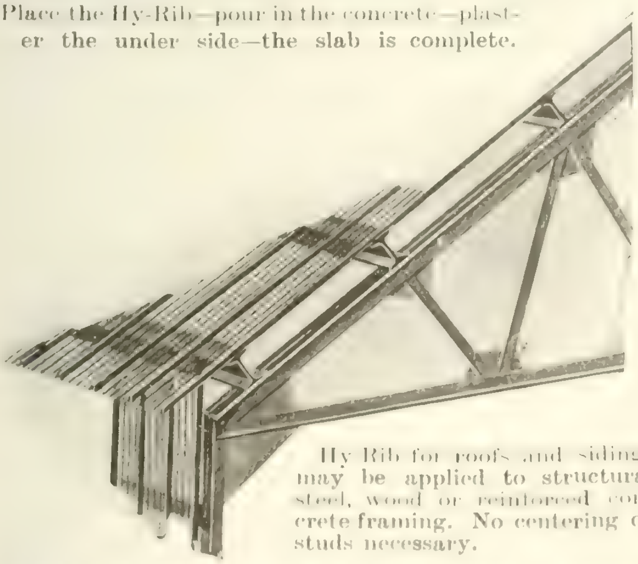
A Steel lath with deep stiffening ribs made from the same Sheet of Steel.

Furnished in three weights of metal, Nos. 2, 3 and 4
Ribs 13-16 inches high and 3½ inches center to center.
Sheets 10½ inches wide center to center of outside ribs.
Standard Lengths—6 ft., 8 ft., 10 ft., and 12 ft.

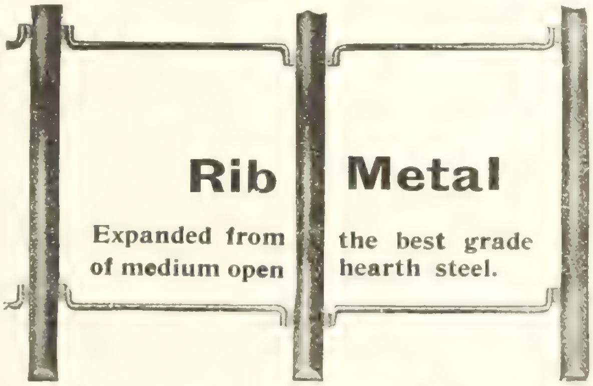
FLOORS AND ROOFS

Hy-Rib serves as reinforcement and centering for concrete floors and roofs, doing away entirely with falsework.

Place the Hy-Rib—pour in the concrete—plaster the under side—the slab is complete.



Hy Rib for roofs and sidings may be applied to structural steel, wood or reinforced concrete framing. No centering or studs necessary.



RIB METAL

A Steel Mesh Reinforcement for Concrete Floors Roofs, Walls, etc.

Made in Sheets up to 18 feet in length, out of the one piece of material.

Greater effectiveness than any other similar material.

Easy to handle.

Other KAHN SYSTEM Products are Kahn Truss Bars, Rib Bars, Column Hooping and Trus-Con. Chemical Products.

TRUSSED CONCRETE STEEL COMPANY OF CANADA
LIMITED

Head Office and Works, Sales and Engineering Office:
WALKERVILLE, ONT.

BRANCH OFFICES:

Union Bank Building, Winnipeg: 23 Jordan Street, Toronto: Corner St. James and Dalhousie, Quebec; 52 Hutchinson Building, Vancouver; 28 Bedford Road, Halifax; 128 Coristine Building, Montreal

Circular Diamond Saws

For Limestone, Marble and Sandstone

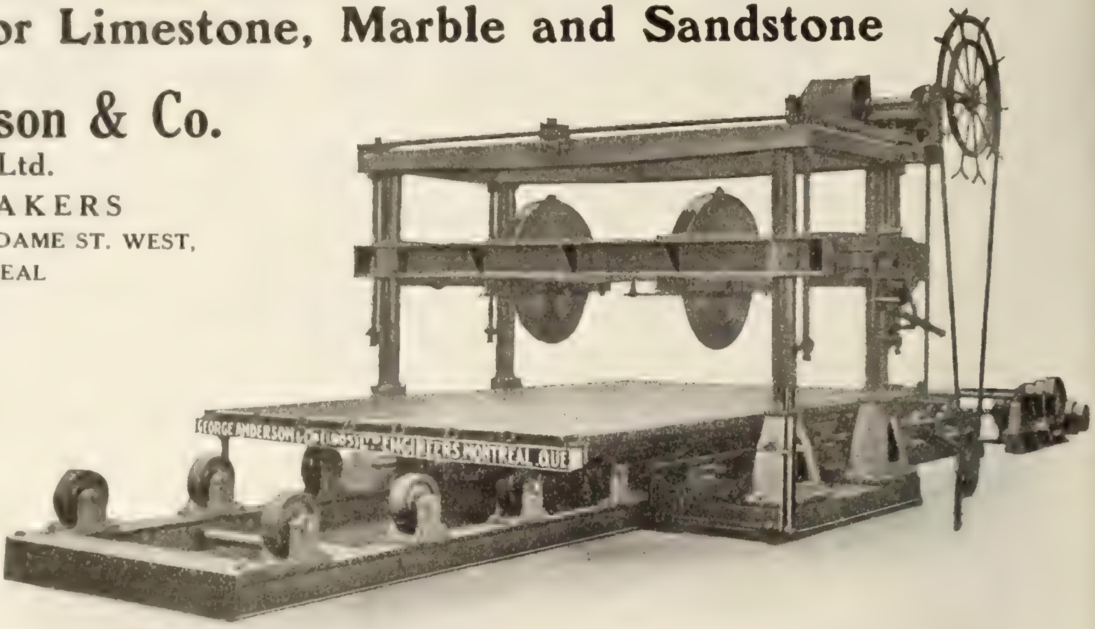
Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

Branch Office & Works

London, England, 82 Victoria St. S. W., Newark N.J. U.S.A. 420-422 Ogden St., Montreal Works, 157 Craig St. West, Head Works, Carnoustie, Scotland

MAKERS OF

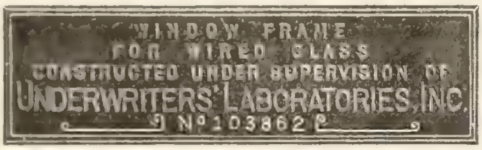
GANGS, PLANERS, MARBLE DRESSERS DERRICKS, AND ELECTRIC TRAVELING CRANES UP TO 50 TONS, QUARRY MACHINERY, GAS ENGINES AND PRODUCER PLANTS 10 H.P. TO 150 H.P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262

SINGLE AND DOUBLE TABLES

About 50 of the above Machines at work in Canada


WINDOW FRAME
FOR WIRED GLASS
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES, INC.
No 103862

Underwriters' Label.

The Underwriter's Test

There is absolutely no question as to the comparative value of our Metal Fireproof Windows over the old-fashioned metal or metal-covered wood shutters. Repeated tests have proved conclusively the superiority of metal fireproof windows.

The ideal fireproof windows should be constructed to meet the following requirements:

It must be absolutely fireproof.

It must have hollow sheet metal frames and sash, fitted with wire glass.

It must be riveted and locked together so that it will not fall apart when exposed to intense heat, solder only being used to finish the seams and mitres.

The Douglas Window has stood the National Board of Fire Underwriters' test to which it has been subjected at their Laboratory at Chicago, and is endorsed by them.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

The
Tillson Company
Limited
Wholesale Manufacturers of

Sash, Doors, Mouldings, Frames for Doors and Windows, Columns, Interior Finish of Every Description, Porch Work, Gable Ornaments, Brackets, Head Blocks, Corner Blocks, Base Blocks, Door and Window Screens, Etc.

Millwork of all kinds

Tillsonburg,
Ontario

The Steel Company of Canada Limited
Hamilton - Toronto - Montreal

PLAIN ROUNDS,
& SQUARES,
COLD TWISTED
SQUARES

MAXWELL
DEFORMED BAR

STEEL BARS
for Reinforcing
Concrete

J. H. NEW, President RYLAND H. NEW, Vice-Pres.

Hamilton Vitrified Salt Glazed Sewer Pipe

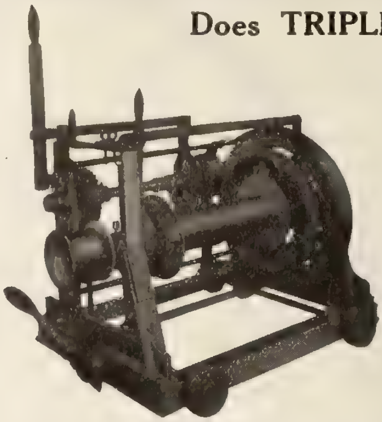
Known as the best for 50 years
The Quick Shippers

The HAMILTON & TORONTO SEWER PIPE CO., LIMITED
HAMILTON and TORONTO

LONG DISTANCE PHONES: { Toronto, Main 990, College, 1558
Hamilton, 3990, 3991, 3432

The Parker Reversible Friction Hoist

Does TRIPLE Duty



Run with Gasoline Engine or Motor

No Experienced Operator Required

Drum, Elevator Sheave, Winch-head all operate independently of each other, and are each reversible. This hoist operates a derrick from the drum, a double cage material elevator from the sheave, and serves various other purposes from the winch-head—all on one job.

PAYS FOR ITSELF ON ONE ORDINARY JOB.

"I have used your No. 100 Reversible Hoist for over 5 years. It runs like a clock and has cost me nothing for repairs."
From an Experienced Contractor.

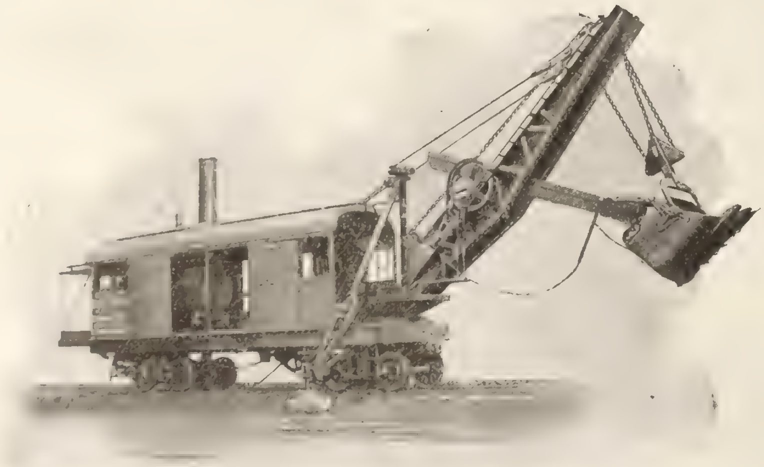
We also build derricks, steam and electric hoists in all sizes. Sole manufacturers of the PARKER PATENTED DERRICKS.

Write for information and prices.

S. E. PARKER, 1800-2 N. Francisco Ave., Chicago, Ill.

Selling Agents:
Gorman, Clancey & Grindley, Calgary and Edmonton, Alta.
J. L. Stuart Machinery Co., Winnipeg, Man.
A. G. Langley & Co., Vancouver, B.C.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert Pipes

We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

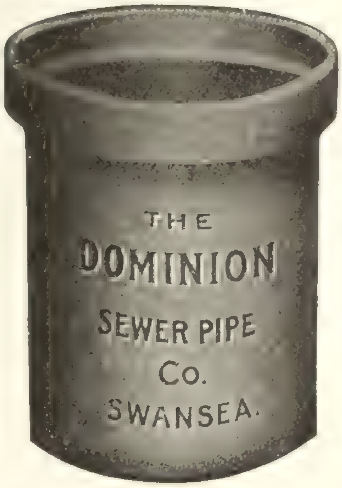
Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

The Pipe of the Hour — Mimico Brand

MIMICO PIPE IS RIGHT

ROUND PIPE and SQUARE DEALINGS

It is not Gas Pipe nor Steam Pipe, it is

SEWER PIPE

MEN who know have
Intimated to us
Many times that
It pays to buy "Mimico." The
Cost is little or no more than
Other makes.

Perhaps you are
Interested in
Proposed contracts. Ask the
Engineers about it.

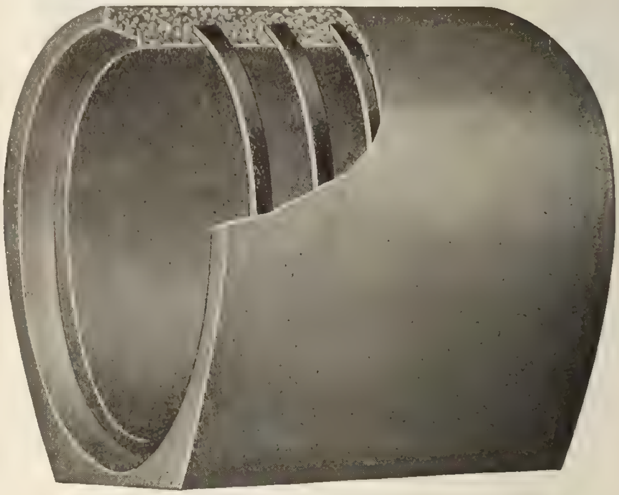
The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422; Evenings, Park 3888 and 3889

Railway Engineers and Contractors

Timber culverts rot, clay pipe culverts break from frost or weight, metallic culverts rust and are woefully dear, CONCRETE CULVERTS LAST FOREVER and the price is relatively low.

The only absolutely **durable and frost-proof** culvert pipe is

REINFORCED CONCRETE



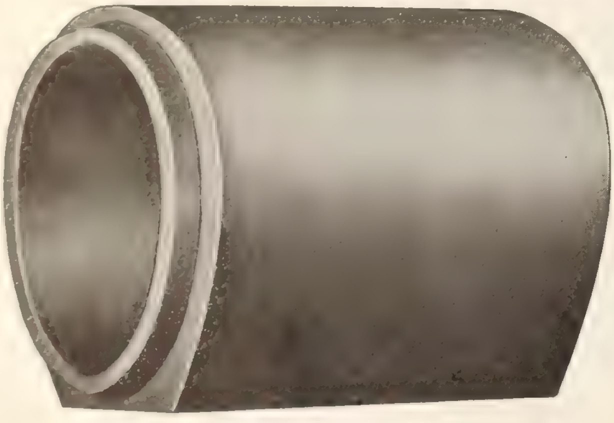
36″ Section

of **first quality.** The prime requisites of first quality concrete are **good raw material, proper proportions** and **scientifically correct methods.**

We possess all these in the highest degree. Our years of experience, our facilities and our raw material enable us to make **good concrete** and make it **always good.**

Nowadays the railway engineer must get results in **permanency** as well as in other matters. The contractor too must get results if he is to stay in the game. A very important result to him is the **economy** of buying material that **holds out,** that can be handled with **facility,** and that can be procured **promptly** and at a **reasonable price.**

Don't imperil your interests by using non-durable material, or by trusting to the random hits and misses of a novice when you can buy **durable, mature,** and **guaranteed concrete pipe,** from a long-established and reputable firm.



30″ Section

Mature Stock

Prompt Shipment

Quality Guaranteed

No Loss from Breakage

Low Prices

WRITE FOR CATALOGUE AND PRICES

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO

Placing EXPANDED METAL in one of Toronto's newest and most modern fire-proof factories—the new 14-storey building of The T. Eaton Co., Ltd.

Why EXPANDED METAL Remains the World's Standard Reinforcement

Expanded Metal reinforces a concrete slab in **all directions,** without wiring or cross-bonding.

Expanded Metal with its rough, twisted strands, diamond meshes and stronger-than-welded joints, furnishes a **bond** or **anchorage** theoretically and practically perfect.

Expanded Metal strands are **flat** and **straight,** not wavy and winding—hence no "straightening out" ensues when form-work is removed.

Expanded Metal—unlike rods—when once placed is not easily disarranged. The position computed for it by the engineer is assumed and kept.

Expanded Metal is not only **cheaper** and **simpler to use** than any other reinforcement, but, taken point for point, incomparably more efficient. Do not fail to consult us about your reinforced-concrete problems.

Large, illustrated Catalogue explaning the "STEELCRETE" System just off the press. You should have a copy

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE FRASER AVENUE

MONTREAL
138 CRAIG STREET WEST

St. John—13 Germain St.
Quebec—153 St Paul St.
Ottawa—83 Banks St.
Regina—Black Block

Fort William—113 N. May St.
Winnipeg—334 Garry St.
Calgary—309-8th Avenue.
Vancouver—416 Pacific Bldg

The Wise Man

puts a roof of "Asbestos Shingle" on his building and his work is fireproof. waterproof and immune to the effects of time and erasion.

The man who uses inferior materials puts on a good many roofs and then does not get satisfaction.

Asbestos Shingles

are not an experiment but a practical well tested roofing that has never failed to "make good."

The fireproof quality of Asbestos Cement Slate a thoroughly fireproof material, which, owing to its strictly scientific manufacture, cannot become either cracked, rent or scaled in case of fire.

SPECIFY

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P. Q.
Factory at Lachine, P. Q.

TENTS

for Engineers and Contractors

We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

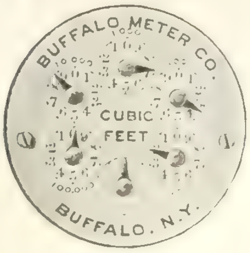
**Send for our catalogue
It will interest you**

Woods Limited

Woods Building - Ottawa, Ont.

AMERICAN AND NEW NIAGARA

WATER METERS



Standard Dial

Straight Reading Dial

**Jewel Bearing
Intermediate Gears
Self Cleaning and Sanitary
Adjustment for Pressure
Extra Thick, Strong Disc
Accuracy Guaranteed
Fewest Parts**

BUFFALO METER CO.

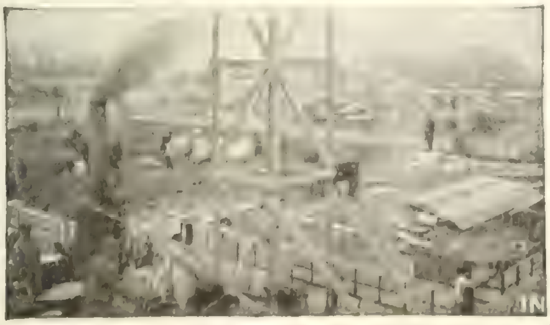
290 TERRACE, BUFFALO, N.Y.

**The United States Steel Corporation, at Gary, Ind.;
Stone & Webster Engineering Corporation, Minneapolis, Minn.;
A. Monsted Co., Milwaukee, Wis.;
Geo. B. Swift Co., 903 Security Bldg., Chicago.;
Pacific Coast Condensed Milk Co.. Seattle, Wash.;
Sheffield Farms-Slawson Decker Co. Amenia, N.Y.; and
Inland Steel Co., Indiana, Ind.,
are among the largest users of concrete in the United States. They and many others, are using**

REICHERT METAL FORMS

And saving from 3 to 7 cents per square foot.

Why do YOU stick to the old methods and let this additional profit slip away from you?



Building a big factory building with Reichert Metal Forms—Pacific Coast Condensed Milk Company's plant at Berlin, Wis. Stone & Webster Engineering Corporation, builders.

REICHERT MFG. CO.

MILWAUKEE, WISC., U.S.A.

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

**Main Office - 90 West Street
New York City**

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

Manufacturing 60 inch pipe for the Low Level Interceptor, Toronto.

Lock Joint Pipe Co.

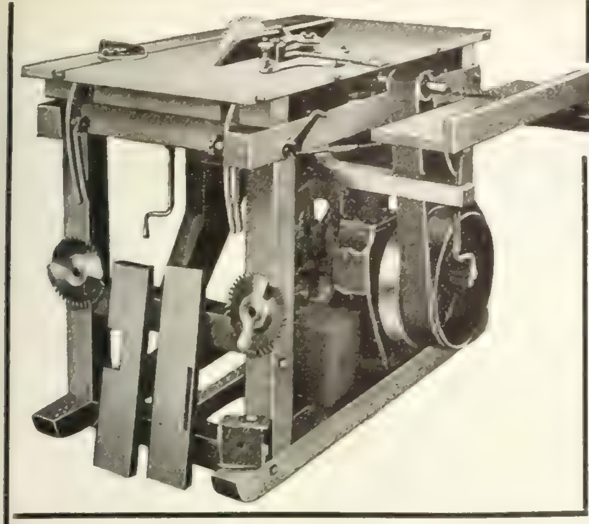
165 Broadway - NEW YORK CITY

Write for Illustrated Catalog

QUEBEC AND ONTARIO
Francis Hankin & Co.
231 Coristine Bldg., Montreal
199 Yonge St., Toronto

MANITOBA, SASKATCHEWAN AND ALBERTA
F. H. McGavin Company Limited
103 Osborne St., Winnipeg

BRITISH COLUMBIA
Pacific Lock Joint Pipe Co.
1005 A St. Tacoma, Wash.
Globe Bldg., Seattle.



On Every Concrete Job

You can save 10 to 15 per cent by using our Contractor's Portable Saw and Variety Woodworker.

Now is the time when you are starting to do your concrete work and this saw will be just what you are looking for—a cheap practical saw that will prove itself a time saver and money maker for you.

CONTRACTORS SUPPLIES OF ALL KINDS

The
Canadian Fairbanks Co., Limited
Fairbanks-Morse Gas Engines, Fairbanks Scales. Safes and Vaults.

Montreal Winnipeg Toronto Vancouver
St. John, N.B. Calgary Saskatoon Ottawa

WHAT IT IS

A Rip Saw
A Matcher
A Mitre Saw
A Cut-Off Saw
A Dado Machine
A Jointer
A Boring Machine
A Gaining Machine
A Grooving Machine
A Babbitting Machine
A Moulder with Self-Contained Power

You Can Pay for the Mixer on a Single Job by the Greater Economy of Operation

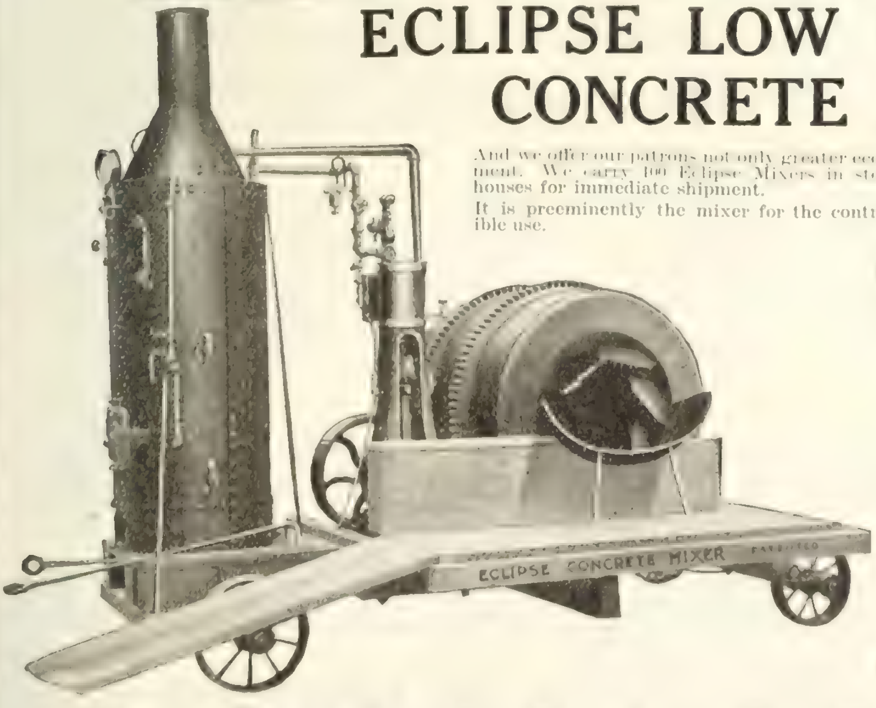
It is not alone the saving of 1-3 in first cost, 1-2 in power, one man to operate the hoist and 2-3 the delays and repairs, but the greater portability enabling it to always be kept at the most convenient position on the job for rapid work that are the distinguishing features of the

ECLIPSE LOW CHARGING CONCRETE MIXERS

And we offer our patrons not only greater economy of operation but unequalled service in shipment. We carry 100 Eclipse Mixers in stock at our factory, stores, warehouses and branch houses for immediate shipment.

It is preeminently the mixer for the contractor because it saves money in nearly every possible use.

Our new 1911 catalog No. 45 is just off the press and gives full information how to handle the Eclipse to obtain best results. Write for it. Our testimonial booklet explains how other contractors are making money by using the Eclipse Mixer.



You Can Buy the Small Size Eclipse Batch Mixer Complete with Power at a Lower Price than a Continuous Mixer.

MANUFACTURED BY

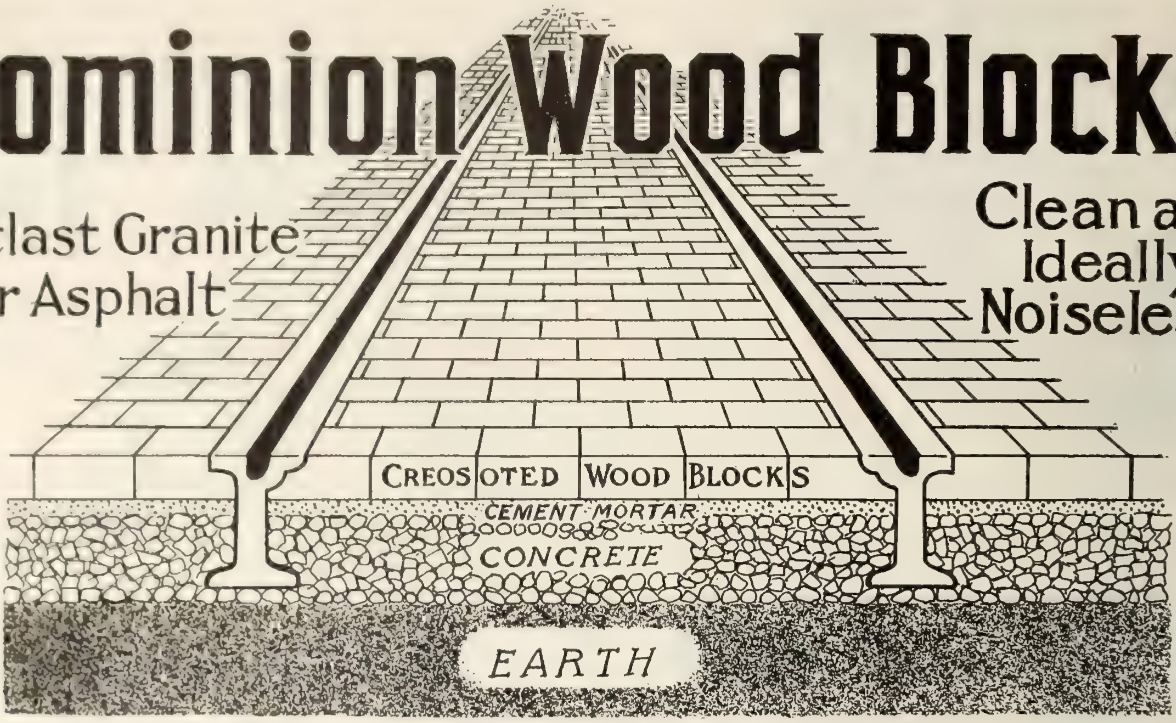
The Standard Scale & Supply Company

CHICAGO 1345-1347 Wabash Avenue
PITTSBURGH 213-215 Water Street
PHILADELPHIA 35 South Fourth Street
NEW YORK 136 West Broadway

Dominion Wood Blocks

Outlast Granite or Asphalt

Clean and Ideally Noiseless



Dominion Wood Blocks

make the most durable pavement for all classes of service, from the lighest wear of boulevard vehicles to the grinding of the heaviest trucking traffic. It is the one pavement that won't need the annual attention of the repair gang and will pass out of reserve in perfect condition.

Don't put your money in a pavement that will need patching before the final payment is made on the assessment.

The Dominion Creosoting Co., Ltd.

SUCCESSORS TO

Dominion Carbolineum Works LIMITED

Vancouver, B.C.

John Whitehead & Co.

LIMITED

Albert Works: PRESTON, ENGLAND

Makers of

Reliable BRICK MACHINERY Efficient

Tile and Pipe Machinery, and

CLAY WORKING PLANT

for all classes of Clays and Shales.

INQUIRIES SOLICITED. CATALOGUES POST FREE.

Established over 75 years. TELEGRAMS: Brictile, Preston

Representatives in Canada: Messrs. Chambers & Simpson, Engineers, Toronto

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

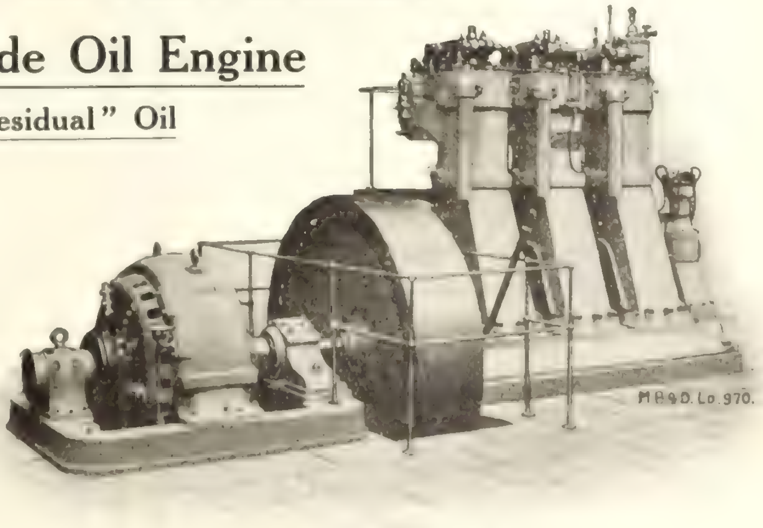
3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

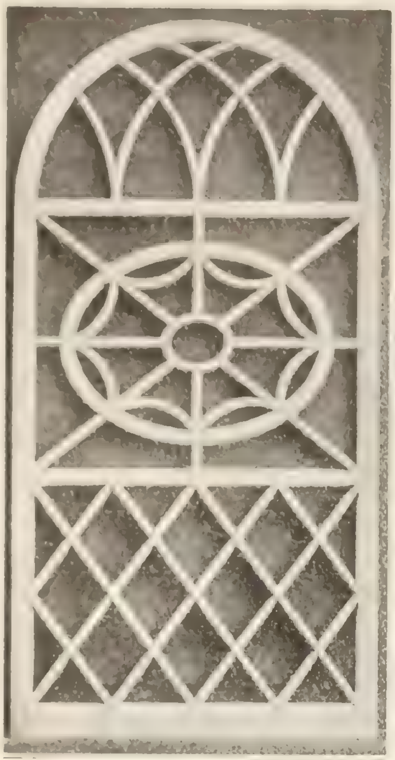


No Ignition Gear
No Producer
No Chimney
No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdowns
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses

HIGH SPEED SLOW SPEED

35 to 1000 B. H. P.



Diamond Sash

particularly suited for Gothic and Queen Ann style windows. It is impossible to successfully manufacture these sash without the proper machinery, but we have it. Every light is uniform, the joints are perfect and all the lines are absolutely straight where they should be and uniformly curved in the curved parts;

M. Brennen & Sons Mfg. Co., Ltd.
HAMILTON, ONTARIO

THE REMEDY

FOR THAT HOT AND STIFLING ROOM
IS A

Sturtevant

Electric Propeller Fan

¶ They increase output, reduce sick leave, and raise efficiency of workers by keeping the air fresh and cool.

¶ Easily and cheaply installed, the first cost is small.

¶ The scientific design and construction of fan blades makes possible the moving of immense volumes of air at small expenditure of power.

¶ These fans are invaluable for use in workrooms, offices, kitchens, billiard halls, and in all places where heat, smoke or fumes are to be removed.

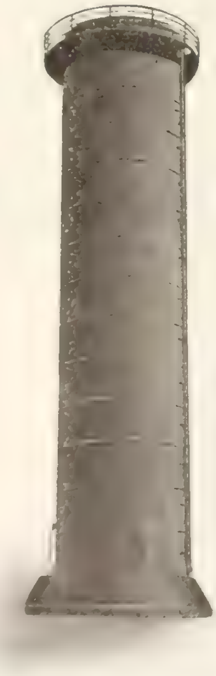
¶ Our engineering staff are always ready to make suggestions if you will inform us of the conditions to be met, the size of the room, etc.

B. F. STURTEVANT COMPANY
HYDE PARK, MASS.

Eady-Douglas, Limited
Montreal

Polson Iron Works, Limited
Toronto

859



STAND PIPES
and
Elevated Tanks

Highway Bridge and Concrete Work.

Boilers of all kinds.

Steel Piling.

Over a quarter of a century's experience in the manufacture of these lines.

Get our figures before closing your contracts

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

The Contractor's "Money Saver"

Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment --- Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto—write us **to-day.**

MACHINE
PAYS FOR
ITSELF
IN A FEW
DAYS.

" Little Giant Floor Scraper "

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

Tel. Main 4155

We are now in the

Sand Business

Our Wagons hold 2½ Yards

High Grade Sand and Prompt Delivery

Rogers Supply Co.

28 King St. West,

Toronto

KITON is nothing else but **TAR**

which through a Patented Process is made

Soluble in Water

This solubility however is lost, the moment KITON becomes dry for the first time, that is, after evaporation of the water with which it is mixed. From that instant on, KITON can never be re-dissolved in or washed off by water. It is **impervious** and **weatherproof.**

just like tar

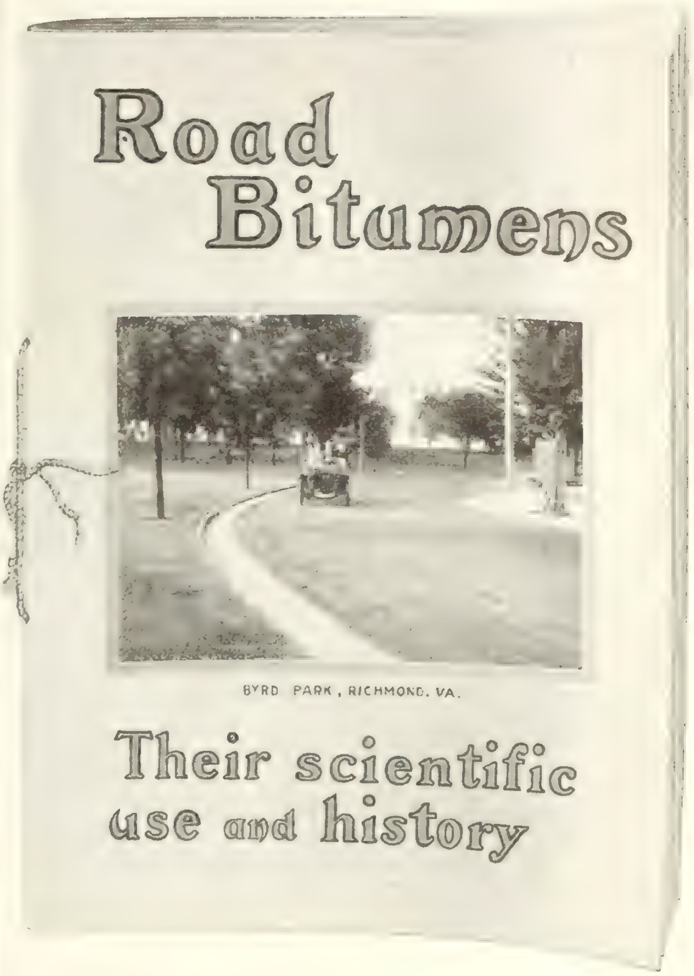
BECAUSE it can be applied as easily as ordinary paint,
" it can be coloured if desired,
" it is so economical and yielding,
" it is instantly ready when you want it,

KITON is the cheapest and most reliable surface coating for material subjected to the deteriorating action of weather and atmosphere.

ASK FOR BOOKLET, SAMPLE AND PRICES
ATTRACTIVE PROPOSITION FOR DEALERS

F. P. Mansbendel

General Distributor for Canada
212 Huron St., - Toronto, Ont.



Road Bitumens

BYRD PARK, RICHMOND, VA.

Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a pamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement Company

First National Bank Building
CINCINNATI

ATLANTIC STEAM SHOVELS

CLASS 45-16-2½ ATLANTIC SHOVEL

ECONOMY IN OPERATION

Reduction in friction and boiler losses, with corresponding increase in pull at dipper is the reason why the Atlantic shovel digs more at less cost than shovels of the chain type.

Wire rope hoist, found only in the Atlantic, exerts a direct pull on the dipper and substitutes friction of a rope with but one large sheave for that of a chain with from four to six additional small sheaves. The less power lost in the machine itself, the more you have left for digging.

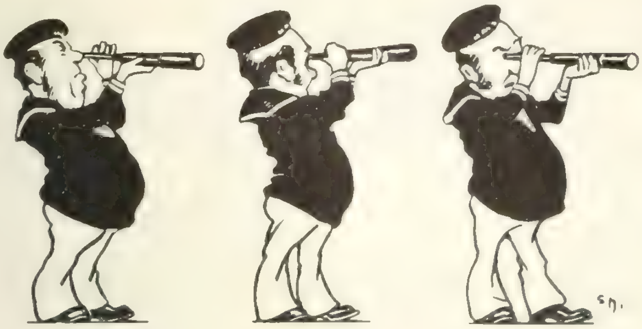
Further economy in operation is secured by using a large boiler of the locomotive type, in which more of the heat is utilized and less is lost up the stack. This is possible only because of the removal of the hoisting engines from their usual position on the car body, to the boom.

The placing of the main hoisting engines at the foot of the boom reduces the power necessary for swinging the boom and removes the twist upon the car body when working on one side. With this construction the turnable center and boom foot constitute the engine frame. One casting takes the place of four or more in the usual construction, reducing the total weight of the shovel, and the weight on the front trucks.

Spare parts are kept on hand at our works at Longue Pointe, Montreal, Canada. Every part is made to gauges, and sure to fit.

MONTREAL LOCOMOTIVE WORKS, LIMITED

41 OTTAWA BANK BUILDING, MONTREAL, CANADA



Looking for Business

Then our DAILY REPORT SERVICE will help you. Our organization provides the only systematic method yet devised for reporting Building and Engineering projects from their inception to completion.

Special facilities for gathering news of sales opportunities in machinery, equipment and materials required.

Ask us for further information. Let us send you rates and specimen reports.

We Want Men

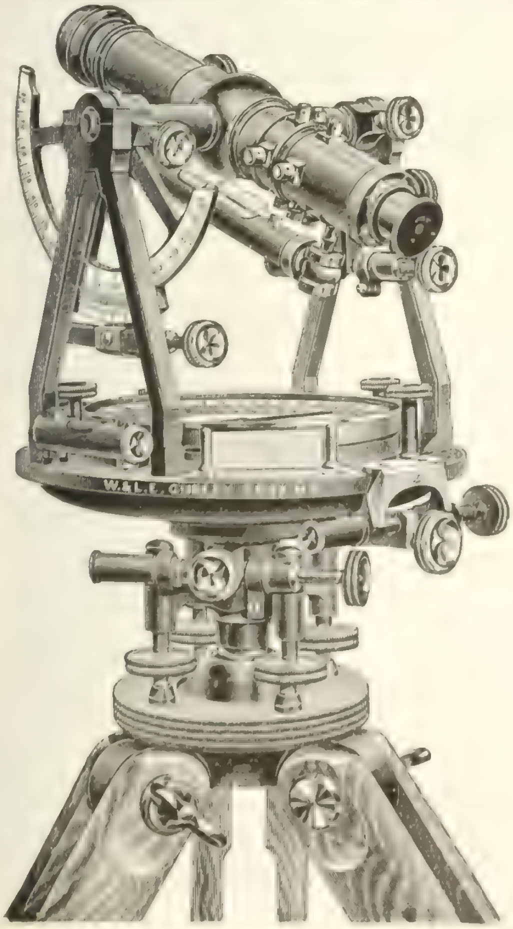
We require a man in every important town in Canada to report the progress of the building and engineering activities of his locality. We want men to tell us when machinery, equipment, supplies and materials are required—men who can report promptly and accurately news of all sales opportunities in these trades.

We report this information daily to our subscribers. This enables them to get in direct touch with the buyer.

There are one or two places where we are not represented. Perhaps it is your town. It will be worth your while to ask us.

MacLean Daily Reports

Head Office: 220 King St. West, Toronto. Branches: Vancouver, Winnipeg and Montreal



1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

Transits
Y Levels
Compasses
Plane Tables
Current Meters
Levelling Rods
Chains
Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

THE CEMENT ERA—A monthly trade journal of merit. Devoted to the concrete and cement industry. Is carefully edited in the interest of the trade. Covers the following subjects: Reinforced Concrete Building, Cement Block Manufacturing, Tile Making, Concrete Paving, Ornamental Cement Work, Waterproofing, Fireproofing, etc. $1.50 a year. Send for sample.

CEMENT PIPE AND TILE—By E. S. Hanson. A cloth bound book which fully treats the subject of manufacturing cement pipe and tile, its uses, cost of production, etc. Its author is recognized as the leading authority on this subject. Price $1.00 a copy, delivered.

DIRECTORY OF PORTLAND CEMENT MANUFACTURERS together with manufacturers of Gypsum and Lime. The only directory of its kind. Gives a full list of the companies, their officers, capacity of plants, capitalization, process of burning, etc. Price $1.00 a copy, delivered.

The Cement Era Publishing Co.

1200-1210 Morton Bldg. - CHICAGO, ILL.

We are in the Cement Concrete

Culvert & Sewer Pipe

Business

Have Been Building

Concrete Pipes

For Twenty Years.

Our quality is the highest. Our prices the lowest. Sizes 6 to 45 inches (REINFORCED.)

Railways and Corporations are amongst our satisfied customers.

Write us your wants—we do the rest.

Ebenezer North Co.

LONDON, ONTARIO

Established 1882

THE COMMERCIAL

The WEEKLY FINANCIAL, COMMERCIAL & GENERAL TRADE NEWSPAPER of the GREAT WEST.

Winnipeg, Manitoba

JAMES BRODIE & CO.

Quarriers and Manufacturers of

Canadian Quinsy, Ebony and Stanstead Granite

Monumental Building, Curbing, Paving, etc. Rough Stock a Specialty

IBERVILLE, QUE.

ESTABLISHED 1849.

BRADSTREET'S

Offices Throughout the Civilized World.

Executive Office:

Nos. 346 and 348 Broadway, NEW YORK CITY U.S A

THE BRADSTREET COMPANY gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing and manufacturing concerns, and by responsible and worthy financial, judiciary and business corporations. Specific terms may be obtained by addressing the company or any of its offices. Correspondence invited.

THE BRADSTREET COMPANY.

OFFICES IN CANADA: Halifax, N.S; Hamilton, Ont., London, Ont.; Montreal. Que.; Ottawa, Ont.; Quebec, Que.; St. John, N.B.; Toronto, Ont.; Vancouver, B.C.; Winnipeg, Man.; Calgary, Alta.; Edmonton, Alta.

THOS C IRVING,
Gen. Man. Western Canada, Toronto

Geo. M. Miller & Co.

Architects

Toronto General Trust Building TORONTO

Power & Son,

Architects and Building Surveyors

Merchants Bank Chambers,
Kingston, Canada

Taylor, Hogle & Davis
(Taylor & Gordon,)

Architects

North British & Mercantile Chambers

80 St. Francois Xavier St., Montreal
Telephone Main 281

London Automatic Batch Mixer No. 1
Capacity 50 yards per 10 hours.

London Concrete Mixers

are made in all sizes, meeting every requirement. CONTRACTOR, WE DO NOT DICTATE TO YOU AS TO WHAT STYLE OF MACHINE YOU SHOULD PURCHASE, we have EVERY STYLE AND SIZE of mixer required.

London Automatic Batch Mixer No. 2. Capacity 25 yards per 10 hour

These machines will be shipped anywhere on approval. WHY PAY A LARGE PRICE FOR CONCRETE MIXER WHEN YOU CAN PURCHASE AN AUTOMATIC MACHINE AT A MODERATE PRICE?

The London Automatic Machines will save you money—
- Cost of Producing Concrete.
- In the First Cost of Mixer.
- Cost of Maintenance.

We also Manufacture—

CARTS FOR CONVEYING CONCRETE BLOCKS AND TILE
WHEELBARROWS; CONCRETE CARTS
FACE-DOWN BLOCK MACHINES; RICTION HOISTS
CEMENT BRICK MACHINES; POWER HOISTS
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES

ADJUSTABLE SILL, STEP AND WINDOW CAP MOULDS;
SEWER PIPE MOULDS; FENCE POST MOULDS;
ORNAMENTAL MOULDS; SILO CURBS
CONCRETE CHIMNEY CURBS;
ROCK CRUSHERS;
And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.

London Concrete Machinery, Co., Ltd.

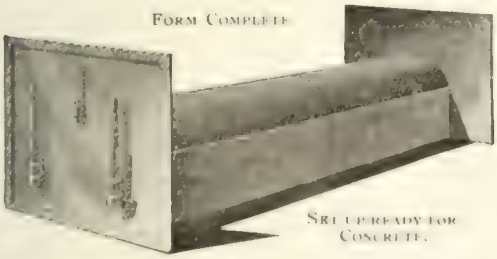
19 Marmora Street, London Canada

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
W. H. Rosevear, 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.
Foss & Hill Machinery Co., 329 St. James St., Montreal.

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.



Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

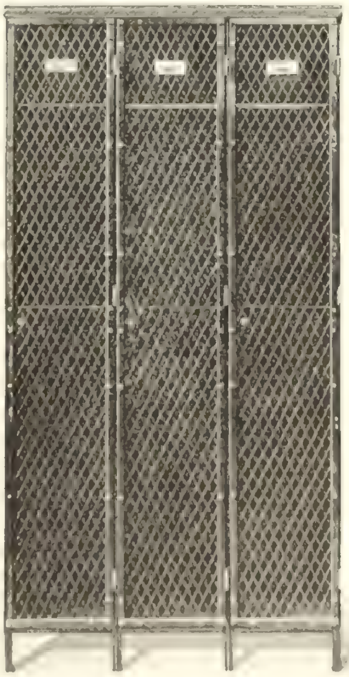
Write for Form Catalogue
Engine Catalogue for the asking
Commissioner's Time Book Free

Concrete Form & Engine Co.

Successor to Collapsible Steel Form Co.

83 Congress St. W., Detroit, Mich.

GET AWAY



from the old style wooden lockers and use **Meadows' Metal Lockers.** Their construction is rigid and embodies a number of original features not found in other makes worthy of your consideration.

Send for our interesting booklet entitled
"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA

Concrete Mixers

SPECIAL REPRESENTATIVE
C. L. TRIMINGHAM
Canada Life Bldg.
WINNIPEG

We want to send you a booklet giving a brief and interesting history of our Mixer. Before you make any further purchases it will pay you to read our literature which is based on actual results. Let us know your wants for we believe we can interest you in our Concrete Mixer.

485 St. James St.,
MONTREAL

485 St. James St.,
MONTREAL

CANADA FORD COMPANY

THE STANDARD
COMPANY LIMITED
GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

We manufacture the most complete line of Sanitary Fixtures for Public Buildings, Factories, Barracks, Schools, etc.

Every combination is set up, adjusted, fitted and tested before leaving our works, and we will save you time and money by sending you complete roughing measurements on request.

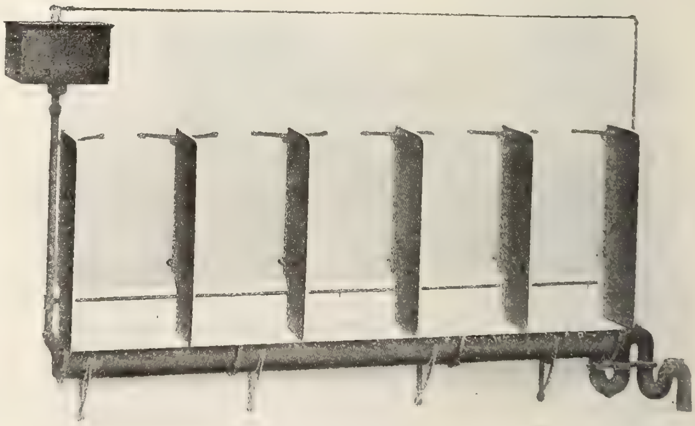


Plate F. 552

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 July 19, 1911 No. 29

The Strained Relation

The feeling of hostility that frequently exists between the engineer and contractor whereby each is ever trying to get the better of the other, and a conflict of wits is always taking place, has, as we all know, a host of disadvantages. Both contractor and engineer are generally worthy firms anxious to do their best for their employers and turn out creditable and satisfactory work. Differences of opinion are inevitable but among the best and the most experienced engineers and contractors, it is safe to say that there exists a friendly feeling and also a feeling of confidence. It certainly is no pleasure to the right-minded engineer to see the contractor suffer any unnecessary loss. As Mr. Jeckell states in his article, entitled, "Duties of a Consulting Engineer," contractors have to live, and by taking up an attitude antagonistic to them he, the engineer, is really working against and not for his client. It has often appeared that a considerable amount of money is wasted and annoyance caused owing to an unnecessary want of confidence, and owing also to a certain reserve on either side whereby each party has misjudged the other's intentions and apprehends that all business relations must be framed in suspicion and distrust.

The old-fashioned horse trade is an illustration of the relationship and has been described as follows:

"The picture is a familiar one to some of you, no doubt, of the two traders with their questionable steeds, watching each other out of the corners of their eyes, while each makes an examination of the other's horse. All of the tests known are tried to see if the horse's eyes are good; his teeth are examined to make sure of his age, and the examination is a very careful one at that, to make sure that the horse's teeth have not been filed up for the occasion. The horse is paced around to see if it is string halt or lame, likewise trotted a distance to see if it is wind-broken, run down hill to see if it is stove up, and examined for ring-bone, spavin, and all the ills that horseflesh is heir to. Then dickering begins as to the amount of boot to be paid by one or the other, each word and action indicating the distrust that the one horse trader has for the other."

The origin of such a feeling between engineer and contractor has not been without reason. Very often the young engineer lacks the business training of which he finds himself in great need, and resorts to theory to too pronounced an extent. Contractors are often tardy in appreciating this fact. The contractor on the other hand has been confronted with a more positive training from which beneficial results in a business way have been more immediate.

It is the duty of the engineer to be, in so far as possible, a mediator between his principals and the contractor, knowing that the one gets the result paid for, or results equally as good, and that the other gets the best possible opportunity to make money in carrying out the work to reach the desired end. Specifications should as far as possible, as Mr. Jeckell suggests, leave the method of doing the work to the contractor, as one contractor may have plans and methods different from those known to the engineer, which will enable him to bid much lower than his competitors. In all cases specifications should be devoid of clauses which favor one manufacturer or one bidder against others.

It is often in the mere reading over of the specifications that the contractor forms a drastic opinion of the engineer. The clauses therein may becloud the mind of the former and appear unnecessary. They may be contradictory and thus obscure the intent. Frequently in compiling specifications the engineer copies portions of an old form for use on the new work, and after turning it over to a clerk or stenographer, clauses are found to have crept in which do not belong there, and the result is a field for trouble and litigation.

However, the many points that arise between the engineer and the contractor are too numerous, though important they may be, to be considered in these columns. The article referred to, states concisely and exclusively ways and means of preventing some differences, improving the result sought after in the contract, and above all, creating a healthy tone between two of the parties involved.

Not Only at Home

The "friend of the family" advice and authority that city councils continue to exercise over our wayward city engineers throughout the country ceases to be a subject of local comment. According to a leading American journal the topic is worthy of a paragraph.

> It is no uncommon thing for the members of the city councils of American cities to take a more than fatherly interest in the working of their city engineers' departments. In fact this interference, this telling the engineer how to do his work, has often resulted in the city losing a capable official. In Canada, if we are to judge from a recent issue of one of our Canadian contemporaries, city councils are also quite active in the running of the city engineer's department. In the "personal mention" columns of the above issue are three items relating to the resignations of city engineers. In one city the city engineer resigned because of the refusal of the city council to give him sole control of his department and because of the independent appointment of an assistant engineer by the city council. In the second city the engineer resigned in consequence of interference with

the department from the city council. It was one of the conditions of the appointment of this engineer that he should be given full control of the department. Instead, it is stated, he was treated in an arbitrary manner and has had to submit to aldermen "who knew little about civic improvement and less about engineering." In the largest of the three cities the engineer resigned following an order of the city council that all civic employees must register their arrival and departure by a time clock.

Whether the publication of this in an American technical journal will tend to decrease the verdure of the Canadian field for American engineers to such an extent as to worry the minds of several of our city councils, who tend to lean kindly toward them, is a question. To them an American engineer famine would be serious, there being nothing Canadian to fill the bill.

What is seriously in the interests of us all to advocate is the appointment of engineers to direct, as responsible heads, the public works departments of our cities. In every large city at least there should be a review board composed largely of engineers to review, to criticise, and to suggest improvements in the work of these department heads. The direction of a city's street department, or sewer department, or water supply department, or bridge department, is a work of management engineering. The engineer fitted to be at the head of great works is to-day a management engineer, something more than a technician but none the less a man of technical attainments. There are such engineers, scores of them, and it is they who should handle our city public works.

Citizens to whom it has become evident that aldermanic appointments are not solutions to engineering problems should assert their influence in an endeavor to place the tasks upon proper and capable shoulders.

Surety Bonds

Editor, Contract Record:

The problem of contractors' cheques has received considerable space in your journal of late, and I think the movement is a worthy one.

It is becoming a very common occurrence for individuals, business houses and municipalities to exact of contractors the filing of a surety bond to indemnify them against any loss they may sustain, up to the penalty of the bond, through the failure of contractors or in the event of the contractor not living up to the contract, plans or specifications.

It is a matter of business and dollars and cents with the owner, and, therefore, no contractor should take offense or think that it is in any way a reflection on his financial standing or ability to complete the contract in a faithful and satisfactory manner. Put yourself in the place of the party about to build, and for argument sake, we will say you expend one hundred thousand dollars, would it not be just and right for you to require some form of security over and above the retained percentage specified in the contract? You know how hazardous a line the contracting business is, and also how easily unforseen contingencies can arise to wipe out your profit on your contracts, and also taking into consideration the fact that the keen competition that exists in the business today will not always allow a contractor to figure against contingencies which may arise and also in the event of the failure of the contractor, experience has shown that the reletting of a contract incurs an extra expense on the owner, and the retained percentage very seldom proves adequate. So I feel sure that you will agree with me, when I say that a party about to build, as a matter of business, has a right in exacting a bond of a guarantee company and also recognizing the nature of the trade.

An antiquated method of municipalities mostly, requiring a deposit of ten per cent. in the form of an accepted cheque, of the contract price, as security for the faithful performance of the work, is being very rapidly replaced by the surety bond owing principally to the fact that contractors who make a specialty of public work find it quite a hardship on their finances to have, say ten per cent. contract price in addition to a retained percentage tied up. So in the event of a contractor filing a bond, he has this ten per cent. working in his business, and in many cases keeps him from running in on his bank to make whatever arrangements might be necessary. So you will readily see it works out both ways. The requiring of bonds is as big a benefit to the contractor as it is to the owner. Any reliable contractor with a good name in the trade and one who has had a knowledge of the business, providing he has not considerably more work on hand than his financial responsibility warrants, can secure the bonds of a Guarantee Company.

There is nothing more satisfactory than when you are in session with an owner or architect who does not know you, it is very nice to be able to say, "I am a reliable contractor, I have done certain contracts in a satisfactory manner and I have a reliable guarantee company who will guarantee my ability to complete the contract in question." So you will see that guarantee company, as well as being a convenience to contractors can also be a friend in need.

When the contractor is associating himself with some bank he chooses the one that is most liberal and courteous; the same idea applies to contractors about to associate themselves with a guarantee company. There are two points which should arise in his mind. (1) What facilities have they for handling my business and (2) will they be as liberal as the next company. A contractor should see that his guarantee company has confidence in him, as it is as essential as having the confidence of your bank, as guarantee companies loan their name which represents money.

F. D. SELWONK.

According to Mr. Takahashi, C. E., who is at present in Canada looking over the many water plants completed and under way, the Japanese are at present very active in developing the water powers of that country. Mr. Takahashi states that he is engaged on a formidable power proposition about 150 miles from their capital city of Tokio, and he has been spending the last two months in the United States, Ontario and Quebec. While he was convinced that the Dominion offers about all he wants to see as an engineer, he will proceed to Norway and Sweden and other European countries where water powers abound. The city of Tokio, he says, is now supplied by two water plants of 67,000 horse power and four steam plants aggregating about 40,000 additional horse power.

The Grand Trunk Pacific Railway propose enlarging its roundhouse at Edson, Alta., to double its capacity.

The Detection of Civic Waste of Water

The Value of the Meter—Its Effect upon Public and Free Water Consumption — Other Methods of Detection — Frequency of Investigation Advisable

The serious problem that confronted the city of Toronto and other cities in the Dominion, during the recent heat wave, when an abundant supply of water was most needful, has occasioned in this city an investigation of the channels of waste. At several times of late the water situation became alarming, and the Waterworks Department do not propose risking a repetition under any circumstances.

The opinions of aldermanic and other officials as to the advisability of installing individual house meters throughout the city now forms daily food for the press. The enormous outlay for such installation is evident. The point that such a procedure might curtail the consumption to an extent sufficient to seriously decrease the revenue of this department was likewise brought up. Imagination rose to the pitch of suggesting that citizens would economize so diligently that the department would be obliged to continually use good water for keeping the sewers flushed..

Citizens do not intentionally cause such a shortage of water as has been recently experienced. The population of the city of Toronto, at least a large proportion of them, are aware that the expense of furnishing water is quite a heavy item, and all of them understand the necessity of payment, sooner or later. There is, however, a very deep prejudice against metering the services of private dwellings, despite the fact that the introduction of meters would undoubtedly prove a help to consumer as well as waterworks department. Before the American Society of Waterworks Associations at a recent convention it was stated and agreed upon that a service charge plus a uniform rate for water, when worked out on an equitable basis in a large city, is almost always productive of a reduced water bill in houses where ordinary care is taken to prevent waste.

A few questions relating to meters and other methods of waste detection has been considered by Mr. Edward W. Bemis in the Engineering Record. In his paper certain broad and important questions of policy are dealt with.

The Metering of Public and Free Water

Almost every water department furnishes water free for fire protection, public buildings and schools, parks, fountains, street and sewer flushing, and often for puddling during pipe and sewer laying and street paving. Water may also be free to parochial schools, hospitals, charities and churches. It is not practicable to meter water for fires or for street or sewer flushing and occasional connections in the parks for lawn sprinkling. In the few cases of this kind where it is physically possible to attach a meter the water used hardly seems to justify the expense, but it is possible to determine approximately the amount of water used by occasional meter tests and by daily reports of the time in which fire hydrants are used for fires, the amount of street and trench puddling and the number and size of flushing carts in use, etc. It is easy to meter all water used by fire engine houses and fountains. Those fountains which run intermittently when a button is pressed can be estimated. It is also easy of course, to meter public buildings, including schools, charities and hospitals.

The only question at issue, both as regards metering where it is practicable and as regards estimates where meters cannot be used, is whether the object to be attained warrants the trouble and expense. There can be no doubt on this subject if the water department is paid, as it should be, for all such uses of water. This is true even if the water department be in the hands of the city and the money thus appears to be taken from one pocket and put into another. Nothing will so stimulate any city department to keep a watchful eye upon its plumbing as the necessity of paying another department or private company for the quantity of water used or wasted. The time will come when every city water department, like that of Holyoke, Mass., will receive pay for all water furnished for every purpose, such as schools, parks, municipal buildings, street flushing, charities, and so forth, and in return will pay for services of other city departments. Even rent will be paid for city buildings and such taxes as a private company would pay. Only in this way can municipal accounting be clear, and the cost and profits or losses of each department be known.

But even if law or custom does not allow the payment to the water works of all the water furnished for public uses, charities, hospitals, etc., there is still abundant reason for metering all that can be metered and estimating the remainder. When the results are brought to the attention of the various city departments and others affected, accompanied by the records of investigations showing what is the probable cause of any large consumption, and by comparisons with similar places in the city or elsewhere, the excess use is very likely to be stopped.

If it is not stopped there remains the publication of the results in official reports and in the daily press, which will lead to the formation of a public opinion that will force proper economy upon the other departments, and will also enable the true profits of the water department to be understood.

In the case of water used for fires, it is hardly necessary to state that the amount of water used is no fair test of the cost of the service, but the amount of water so used should be known.

When the public schools of Cleveland were metered the writer discovered a consumption varying from 5 gal. per child per day throughout the year to over 200 gal. This was based on the average number of chidren in school attendance. The average of all the schools was over 30 gal. Meters, together with investigation and the partial co-operation of the Board of Education, resulted in the reduction of this average to under 15 gal. Leaks and the running of fountains outside of school hours were largely stopped. Save in the high schools and in buildings where long rows of closets were automatically flushed at frequent intervals, whether occupied or not, the average was brought below 10 gal. Children are easily taught to use in school such individual tanks as they will use in after life. If the school authorities had to pay for the present reckless use of water they would adopt such plumbing in all schools. Indeed, the more economical method is already in use in many of the finest primary and grammar school buildings in the country.

Few cities have made any careful study of the amount of free water, whether used by public authorities or given away to charitable institutions. From the data that some cities have given the writer has computed the following:

Free Water per Day, per Capita

Place	Year	Quantity Gallons
Yonkers	1909	3.3
Jersey City	1910	4.3
Chicago	1909	8.3
Cleveland	1909	8.9
Minneapolis	1909	10.0
Fall River	1910	10.7
Worcester	1910	11.0
Detroit	1909	12.0

It is safe to say that free water takes from 3 to 12 gal. per day per capita. In most cities it will probably run from 8 to 11 gal. Let us assume 10 gal. as a fair amount.

Metering of Private Fire Lines

In addition to the use of water covered above under the name of "free water," there is the use of water by private fire lines which are connected with sprinkling systems or with stand-pipes, yard hydrants and roof tanks. As fraud and leaks are discovered in many fire lines, the movement for metering such lines is growing. It is evident that either there must be a suitable meter on each fire line, or a vault with a by-pass where similar test meters can be attached at any time by inspectors of the water department. In either case, some charge should be made for the expense and trouble put upon the water department and the cost of all meters and vaults of this kind should be borne by the consumer.

What Should be Metered First?

Public sentiment is ready for metering all business consumption and free use of water. There are only two questions of really serious import in this connection. The first is, whether business use shall be metered when the business is conducted in only part of the building and when expensive changes of plumbing are necessary to separate the business supply from the rest of the building. The second is as to the order in which the domestic consumption should be metered.

With regard to business conducted in a portion of any building, it would seem that in most cities the people are ready for metering the entire service on part of which there is business consumption, even though it may not be ready for metering all domestic uses. Where saloons or stores occupy the lower part of a building it costs much more to separate the plumbing and install meters separately for the business portion than to meter the whole building, and there is much danger of fraudulent connections afterward between the two parts of the plumbing.

Where, however, the community is not ready for metering such a building, it is hardly worth while to press the matter upon the business portion of the building, if the business is of such a nature as to use little water, as in some small shops and stores. Such has been the policy of the New York water department during the past two years.

Assuming, however, that the community is ready for beginning of domestic metering, where should the work start?

The tendency of many water departments at this point is to meter first the consumers who are thought to be wasting most water. In many places this is a great mistake. It prejudices all classes of consumers against meters. It makes them think that the meter is their enemy—a badge of disgrace. It becomes associated with high bills. Some departments may have sufficient legal or popular strength to carry out such a policy, but in many places it destroys the possibility of general metering. A wiser plan is the one the writer introduced into the Cleveland Water Department, of first metering a considerable portion of those sections likely to have good plumbing and whose occupants are ordinarily prudent in the use of water. Then, if the meter rates are properly adjusted, it will be found that the meter is a financial benefit to this class, which is in the majority in the city. With the sentiment thus established, it is easy to go and meter sections which inspection or pitometer investigations may show to be wasteful.

Having decided what streets to meter, every service on the street should be metered continuously from end to end, thus saving expense in moving about from one location to another.

It is hardly necessary to add that the best stopcocks and stopcock boxes on the market should be provided at the curb on every service that does not already have good ones in working order.

Should All Domestic Services be Metered?

Some ably contend that the metering of one-half of the domestic service, together with all the business and free services, will accomplish almost as much in the line of prevention of waste as will the metering of every service, and, of course, at less cost. This may be admitted if the 50 per cent. of domestic services metered are the more wasteful ones. In that case, it may also be asserted that the flat rate will yield more revenue from the 50 per cent. of prudent consumers than would any reasonable meter rate.

The above admissions do not imply that the metering of exactly one-half of the services would accomplish these results. It is more likely that in most cities 60 to 70 per cent. would have to be metered in order to accomplish as much reduction of waste as is practicable with the smallest expenditure of capital and least loss of revenue. But the above is only one side of the matter.

The fundamental and, in most cities, the fatal defect in all this reasoning against universal metering lies in the assumption that it is practicable to meter only the more wasteful services. Some water companies may be so strongly entrenched in their franchise rights and superiority to public opinion as to be able to do this. The majority of private companies and almost all municipal plants would in time shipwreck their policy and bring discredit on the meter system by placing meters on the services of only the more wasteful half or two-thirds of their consumers. The difficulties would be the same as pointed out above with respect to placing the meters first upon the more wasteful services.

Even if it were practicable to endure the unpopularity incident to metering only those whose bills would often be raised thereby it would be difficult to justify the refusal of meters on the same terms to others. Moreover, one of the great arguments for meters, the justice of charging according to the quantity of water used rather than according to ridiculous rules, such as the number of rooms or fixtures or frontage, would lose much of its force if the water department refused to apply the principle to its more prudent consumers.

Frequent Reading and Free Investigating

Too much emphasis cannot be placed upon matters dwelt upon in previous articles, the importance of frequent reading with notices to proprietors and consumers of any large and unusual meter registration, and the offer of the services of the department free in locating causes of the same.

In Cleveland the domestic consumption of water was nearly 5 gal. per capita per day greater, or 25 per cent. greater in 1910 than in 1909, a large portion of this increase being due to the discontinuance by a new administration of this policy. To be sure, the city obtained larger revenues at less cost, but with injury to the water consumers and the popularity of the meter system and a detriment to the whole water administration.

Other Methods of Waste Detection

There are two methods of attack upon waste; one by meters, the other by house to house inspection with the imposition of penalties where necessary and the investigation and stoppage of slips at the pumps and leaks in street mains and service. Both are absolutely necessary to any satisfactory settlement of any question that might arise. Where meters are universally used, house to house inspection may be omitted, except to assist property owners to locate leaks where the meter shows a large consumption, but even universal metering will not dispense with the need of discovering and stopping the slip of pumps and the waste in the street mains and services. By the use of pitometers or Venturi meters, slips of modern and almost new pumps of over 30 per cent. have been discovered in some cities. The mere substitution of new pumps, with proper maintenance of the same, has been responsible for a considerable apparent reduction in per capita consumption in Philadelphia and Cincinnati. Misguided but honest people often argue against the meter system, because in universal metering in Milwaukee, Yonkers and some other cities, over one-third of the pumpage and below 15 gal. per day per capita has been proved in Cleveland and other universally metered cities. The slip of modern pumps should be kept below 4 per cent., and the slip of the meters below 3 per cent., and 8 per cent. should cover all other unaccounted for uses of water in a fully metered city.

Not only must the slip of the pumps be stopped in order to reach such a record, but careful surveys must be frequently made of the street mains and the services from the main to the meter. This can be done by pitometers supplemented by the use of hose and meter for block to block investigation. By the latter method, the water flowing into a block in the middle of the night is taken through a metered fire hose from a hydrant outside of the block to a hydrant inside of the block. It was the combination of the pitometer, the Deacon meter, in general use in England, and the hose and meter, joined to the fact that the city had directly laid every foot of street mains from the start by its own labor and not by the contract, that is responsible for the excellent record of unaccounted for water in Cleveland. Large results are being accomplished by the pitometer at the present time in Washington, Chicago, New York, Yonkers, and elsewhere.

When the writer took charge of the department of waste detected and metering in New York City, in January, 1910, no methods of waste detection were in use, but the pitometer and house to house investigation from the start have already borne considerable fruit, although the hose and meter work was stopped after the writer left and none of the work was pushed to one-tenth of the extent which the writer had planned. Yet many millions of gallons a day of underground leaks have already been found and stopped in New York. In Washington, 20,000,000 gal. per day of underground leaks have been found and stopped since 1906, and over 6,000,000 gal. per day of underground leakage was found and stopped in Chicago in 1910. By far the larger proportion has been found to be in services and at the base of fire hydrants. Where the meter, as in Cleveland, is placed in the majority of cases in a vault at the curb, it will detect leaks in one-half the length of the service, but even then the use of hose and meter, aquaphone, detectorphone and pitometer or Deacon meter is needed for the street part of the service and for the street main.

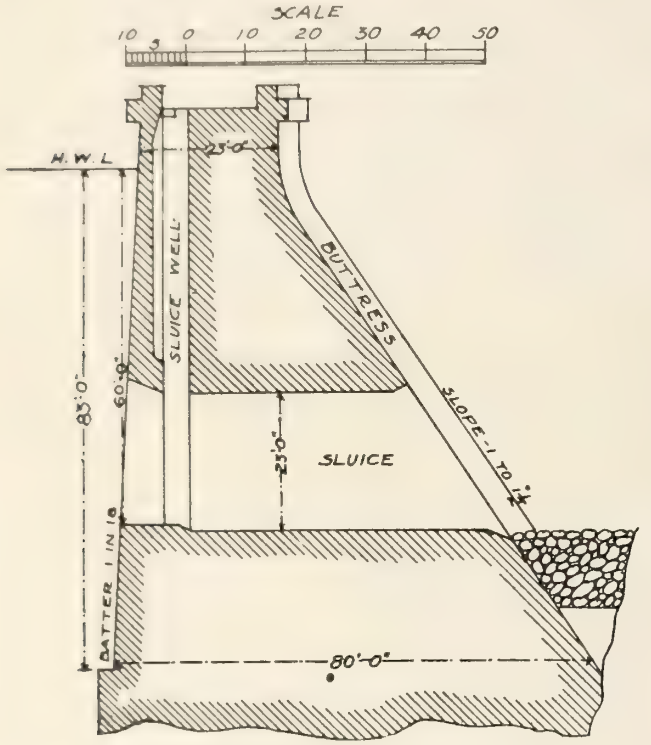
In a period of threatened water famine, like that in New York City to-day, brought on by most disgraceful neglect by several administrations, house to house inspection will do much temporary good if pursued with thoroughness, tact and perseverance. It has hitherto been found absolutely impossible, however, in America, to rely for any length of time on house to house inspection as a substitute for meters. Chicago, during the last three years, has been doing a commendable piece of work in pitometer and house to house investigation, yet the per capita consumption has increased from 190 gal. per day in 1900 to 237 gal. in 1910, with only 6 per cent. of the services metered. Mr. T. C. Phillips, who has charge of the work, earnestly advocated meters in an article in the Engineering Record of March 4, 1911. In the last report of the Washington, D. C., water department for the year ending June 30, 1910, it is stated that the pitometer investigation showed the night flow per square in typical metered territory to be 873 gal. per day against 10,500 gal. in unmetered territory.

The general conclusion of this necessarily brief description of other forms of waste detection is that each method, whether by pitometer, house to house inspection, etc., or by meters, needs the other method. My own experience, however, has convinced me that where, as in Cleveland, universal metering is possible, it is by far the more important and effective of the two methods, although both should be used. In the majority of the cities, however, where the public is not yet ready for universal metering, a large development of various forms of waste detection and prevention aside from meters will not only effect great good in itself, but will prepare the public mind to undertake the large work which only universal metering in American cities can accomplish.

Strengthening the Great Assouan Dam

Remarkable Engineering Feat in Progress—Irrigation Project of Vast Importance—Answer to Criticism

When the Assouan Dam is mentioned in engineering circles, its importance, dimensions, and the technical difficulties surmounted are invariably described as "very great," yet no one who has not actually seen the structure can realize its remarkable value, its magnitude, or its position as one of the great engineering wonders of the world.



Sectional Elevation of the Assouan Dam.

If the Assouan Dam, as originally built to control the waters of the Nile, is a magnificent achievement, we venture to think that the present work of raising its height some further twenty odd feet must likewise rank as an undertaking of the highest order, and in certain respects we consider the engineering difficulties that have to be overcome not a whit less important than those surrounding the completion of the original structure.

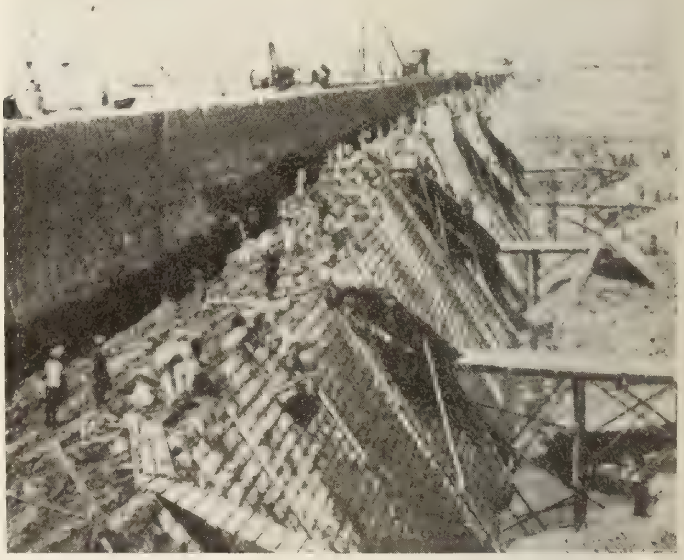
Expressed briefly, the original dam accumulates 234,000,000,000 gallons of Nile water for irrigation purposes, by which means about half a million acres of land have been rendered cultivable. The dam runs 2,150 yards across the Nile, rises 130 feet above its foundation, has a width of 23 feet at the top, and 180 sluices. The additional height will mean water storage 2½ times that of the present enormous amount, and close upon another million of acres rendered arable.

In order to attain this additional storage capacity, the dam is not only being raised about 23 feet, but it is also being thickened, this comprising an additional 16 feet taken down the face to the foundation and firmly bedded into the great aprons that prevent erosion at the foot of the dam. Some three years' work on this strengthening of the dam has already been done, and another two years' on the raising of the structure will probably mean completion sufficiently early in 1913 to obtain the additional water storage for that year.

The primary difficulty has been the joining-up of the new work with the old; and in this Portland cement has played an all-important part, the joint between the old work and the new being about 6 inches wide, close upon 100 feet high, and fully 2,000 yards long, this length, however, being divided into sections. A liquid grout is used. It is mixed in three large mixers and carefully run in through metal flexible hose, loose stone (under 2-in.) having been left in the joints to serve as aggregate, and the grouting taking place when the temperature of the new work and the old is approximately equal.

Of the supplementary works in connection with the raising of the dam, we would mention the extension of the series of locks to take the Nile steamer traffic—this extension involving a strengthening of the locks generally, an additional gate some 80 feet in height, and a clever rearrangement of the existing lock gates.

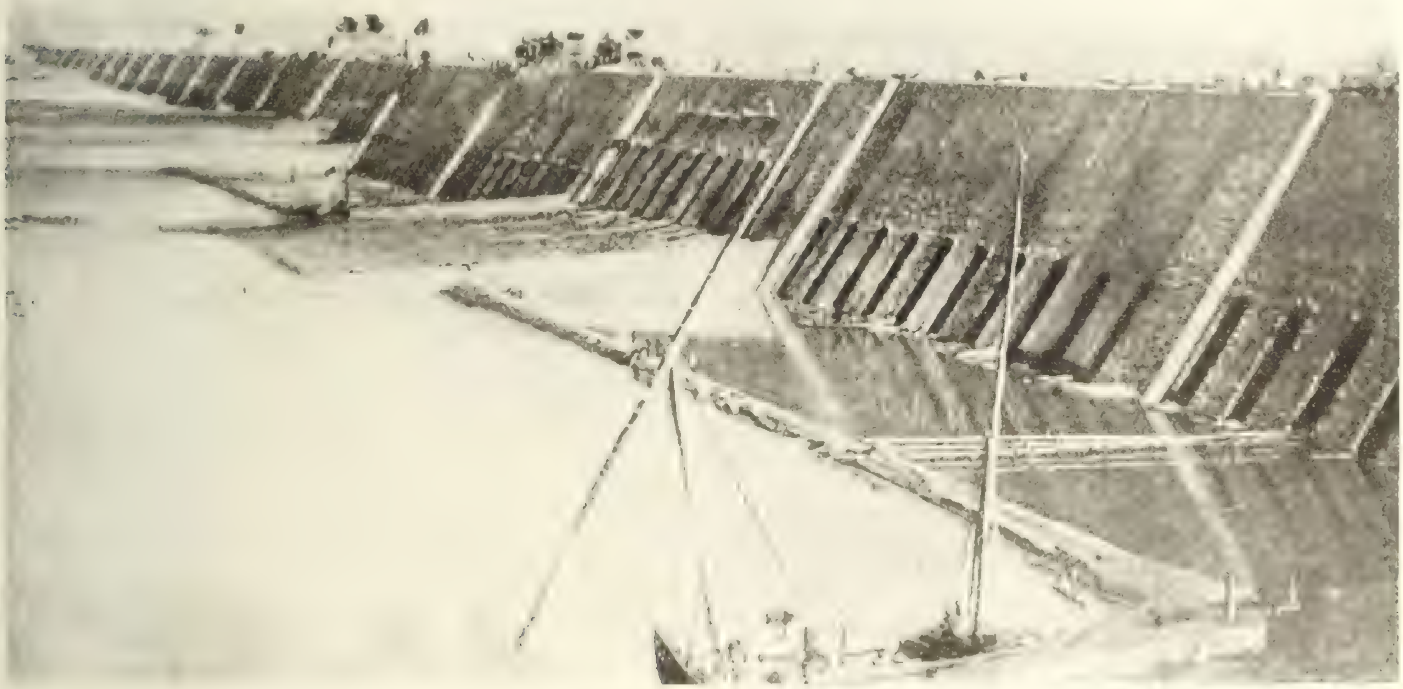
For those concerned with concrete, the work at the dam has a peculiar interest of being a gigantic example of the application of Portland cement concrete and Portland cement generally. British Portland cement has been used throughout, and in the present work—which involves an expenditure of a million and a half sterling—a large part is from the works of the Associated Portland Cement Manufacturers, Limited. The responsibility of providing a perfect cement at such a distance from the Thames



Thickening of Dam on Down Stream Face.

for use in a climate of exceptional dryness and high temperature, should not be underrated, the more so as the slightest hitch in the quality of the material may at any moment involve a very heavy expenditure of time and money in the pulling down and re-erection of the work, seeing that not the slightest of risks can be taken in the execution of this great undertaking.

The illustrations are of sufficient clearness to show some of the features of the work. The position of the great joints, the pipes for pouring down the grout into the joints, the horizontal inspection and test pipes, the bars used between the new and the old work, all show distinctly in the photographs reproduced. In one respect, however, the photographs quite fail to give the correct impression, and that is, as indicated above, in the matter of size and scale. Photography cannot fully assist the reader in this direction.



The Raising of the Nile Dam.

In the illustrations shown Fig. 1 represents a sectional elevation of the Assouan dam across the Nile river as originally constructed. From Fig. 2 may be seen the method of thickening the dam on the down stream face, the operation being shown near completion. Connecting rods bind the old work to the new through a 6-inch poured joint. Cement grout is applied to this joint through perforated pipes on the slope between sluices. Fig. 3 shows this operation completed and the dam being raised. The dam is about 1¼ miles long. It originally contained over 1,000,000 tons of masonry, forming a reservoir extending 140 miles up the valley with greater capacity than any other artificial basin in the world. It is the first unsubmergible dam built without overflowing waste weirs. Flood waters pass freely through the sluices placed at different levels, which are gradually closed after subsidence of the flood, to provide water to supplement the natural supply during any period of insufficient discharge.

The contractors for the work are Messrs. John Aird & Co., the ironwork being supplied by Messrs. Ransome and Rapier.

The operations furnish an example, not only of a great engineering project, but of technical management of unusual excellence. Moreover, the dam, by its look of utility and power, has all the features of a great work of art. The bold, straight line of plan, the curved front, the sluices with their well-regulated streams of foaming water, all speak forcibly of a well-conceived purpose well executed with the least possible waste of material and the least possible superfluity of strength.

Finally, one word to critics as to the submersion of the Temple of Philae caused by the raising of the Assouan Dam. This temple is one of many ruins situated between Cairo and Wadihalfa; and although the temples as a whole are of the greatest possible interest, the single specimen is a mere entity. What each entity is able to teach the present age, has been investigated and recorded, and these records are duly housed within easy reach of students. Whether one or a dozen of the ruins disappear to-day is merely a matter of sentimental regret. The practical loss would be nil, for there is no utility in the ruins, and all they have to teach us has been duly taught. To demand that the possible submersion or occasional submersion of one or more ruins should stand in the way of the development of Egypt, is as unreasonable as it is inhuman. Humanity requires that our knowledge, skill, and means be applied to the improvement of mankind. The lot of the Egyptian is vastly improved by the regulation of the Nile.—Concrete and Constructional Engineering.

The Fields of Operation for Contractors

Scope Limited by Specialties — General and Diversified Work Commended—Experience the Foundation of Reputation—Speed and Capital Great Assets.

Some contractors show marked ability in obtaining work and much of their success at contracting depends upon this. Naturally a contractor cannot make money unless he obtains contracts, and on the proper basis. This is really the selling end of contracting. It should be as well organized and thought out as the operating part of the business.

On public work the personality of the contractor can be made a factor in obtaining work, but in most cases work must be awarded to the lowest bidder, although in some sections awarding boards now have authority to give contracts to those they believe will best serve the interest of the public, irrespective whether they are the lowest bidder or not. Acquaintance with engineers and officials can become an asset, and in private work this is especially so.

In private work some contractors can obtain jobs at much better prices than others, yet they may not have the ability to carry on the construction work as well. Politicians are sometimes made members of contracting firms with a view of obtaining new work through them. This practice is in most cases to be condemned.

Whether the work is to be public or private, the contractor or those who bid for them, should be accustomed to make deals and to handle business men in a diplomatic manner. They should be quick at sizing up men and be good talkers, yet have the ability to make other people talk, and be good listeners. They should have a retentive memory so that they can make notes of conversations after they have occurred, as it is not always good policy to make memoranda while the conversation is going on. They should be able to size up conditions quickly, observe facts, make deductions, and carry general plans in their minds with all facts, figures and other things that may affect the price of the work and the method of carrying it on. When two men are discussing any matter on which a deal is to be made, the one likely to obtain the better side will be the better posted one.

His Favorite Form of Contract

In obtaining work, one governing factor will be the scope of operation a contractor will cover. First comes the form of contract under which he is willing to work. This limits the scope of a contractor's work. If he takes work upon a percentage basis or on the cost plus a fixed sum plan or some similar method, then he is prevented from obtaining public contracts, as they are never let in this manner. A contractor doing work under such forms of contract, if he is honest and wishes to be sincere to his customers, cannot accept lump sum or unit price contracts. One prominent contractor who has made a specialty of doing business under the "cost plus a fixed sum method" said: "At first I took contracts under the cost plus a fixed sum form and at the same time lump sum and unit prices, and although I tried to do justice to the first contracts, I found myself sending my best men and tools and machinery to the job where my profit could be increased and the cost plus a fixed sum contracts suffered, so I decided that if I was to continue under the last named form of contract, I must give up all others," which he did.

This illustrates how a man's scope can be limited by the form of contract he is willing to work under. When any form of a percentage contract is used, then public contracts cannot be obtained and not only is the contractor limited to private contracts but also to those where the owner is first convinced that such a form of contract is to his advantage. Most owners, however, seem to think the lump sum or unit price contracts are more desirable.

Classified Construction

The next factor in the scope of operation is to the class of construction that the contractor places limitations upon. The first great division or distinction is buildings from other classes of construction. Erecting buildings might be termed "architectural contracting" in distinction from "engineering contracting." Some contractors limit their field of work to buildings, and in many towns and cities this kind of contracting has been emphasized as the "building trade." It has almost grown to be a distinct branch of contracting, and frequently contractors, who confine their operations to this field are called "builders." Some of the largest contractors in the country who do this class of work also do general contracting, that is any class of engineering construction, and this fact coupled with engineering contractors, who during the last decade have turned their attentions to concrete building constructions, is breaking up any division between architectural and engineering contracting.

Many contractors limit their operations to subcontracting work on buildings, as carpenter work, brick laying, plumbing, plastering, metal work, electrical fixtures, and many other classes of construction. In some sections of the country these various subcontractors are considered trades people, instead of contractors, but in as much as they all name prices for their work and enter into contracts for it, they must be considered contractors.

Some building contractors specialize, that is, some confine their work to factories and warehouses, others to office buildings, some to residences, some to churches and others to public buildings. Many will take any kind of building to construct, for which they can obtain a contract.

In some cases contractors limit their work to certain materials, as steel, concrete, earth and rock, masonry, timber or wood work, the installation of machinery and other lines.

Some contractors narrow the scope of their operations to difficult and hazardous undertakings. In other words they become specialists in these lines and are thus enabled to keep a corps of men who are trained for such work. Some classes of work of this kind are foundations, subaqueous work, such as tunnels and pipes under water, bridge piers, and similar structures. Docks, piers, and dredging seem to be work that go together and many contractors do this exclusively. Some even confine their work to dredging.

On land we find contractors who build bridges, others railroads, others wagon roads, some sewers, some street paving and sidewalk work, some power dams, others do waterwork construction, such as reservoirs, aqueducts, pipe laying, stand pipes and similar structures. Occasionally we find contractors who confine their work to shaft sinking and tunnel construction. Then some contractors specialize on electrical work, as telephone and telegraph lines, transmission lines, trolley roads and such classes of work.

There are a large number of contractors who do any kind of construction work and under any form of contract and undertake both private and public contracts. Some firms will undertake contracts to build an entire manufacturing town, build the railroad to it, construct a dam for power purposes, build the factories and warehouses, the dwellings of the officials, laborers' houses, store buildings and public halls, electric lighting system, water supply system, sewerage system, and all the details that go to make up a new town or city.

There are many opinions as to the scope of work a contractor should undertake. This alone is shown by the various lines followed as just outlined. Some engineers and contractors claim it is well to specialize, and become experts in certain lines, others believe in covering several lines of similar work or else work that goes hand in hand, and many believe in doing a very general line of work.

Personally the writer is of the opinion that the general and diversified work is the best to follow. More work can be obtained, a wider experience is gained, and in hard or stringent times, when specialists are idle, the general contractor is able to keep his outfits and forces at work, without having to enter new and untried fields. The opportunity of making money is as great, if not greater, than the following only of one line or kind of work.

Choice of Territory

Next to the scope of work, that a contractor will do, comes the territory over which he will operate. Contractors differ very much in their opinions as to this matter. Some confine their operations to one large city, others to the largest cities of the country, some to several states near their home offices, some will work in a section of the country as eastern Canada or the New England states, some limit their territory to the north, some to the south, others to the middle west and some to the far west. Occasionally contractors are found who will not go more than fifty to one hundred miles from their homes, even limiting their territory in which they do work to one or two counties of their state.

On the other hand, there are some contractors who will go anywhere in their own countries, as an American will do work in any or all parts of the United States, Canadians who operate all over Canada, then we find Americans who make a specialty of doing work in Mexico, others confine their operations to Central and South America. There are some few American contractors who will not do work in the States but will undertake contracts in any foreign land. Then we find some American and European firms who do work in any part of the world.

Various arguments are given for limiting the territory of operation, and at the same time excellent reasons are set forth for making the world a contractor's field, but at the best, many contractors are always moving from one section to another, from one country to another, and some within ten years have circled the globe.

Thus work is done under varying conditions, and in order to make a success, contractors must be close students of people and countries, quick to size up local conditions and make correct deductions. They should likewise know the practical side of geology. Thus work in a country in which there has been glacial action is decidedly different from those sections that have never been visited by glaciers. Geological faults change the character of the timber in a country and likewise the soil and they materially change excavation work. The aggregate used for concrete changes in different sections of the United States and also in the world, due to geology to a great extent. Weather conditions likewise vary with the geology of a country. This affects streams that may have much to do with a contractor's work. The bottom of streams is especially affected by such things. Practical geology affects nearly all kinds of construction work. Even street paving and surface road work is affected in this way. The oil tamped roads of California have not been duplicated in the east, owing to the soil and climatic conditions.

Many contractors, in moving from one section of the country to another to do work, have lost money owing to the fact that they have not studied these things and taken them into consideration.

Another factor that governs obtaining work is the reputation of a contractor. This applies to individuals, firms, and corporations. Experience is part of a contractor's reputation, for he gains his reputation as he gains his experience. Every beginner is bound to lack experience, but as many contractors first work as engineers, foremen, superintendents, timekeepers, and in similar positions on construction work, they have some years of experience before actually beginning as contractors.

The Contractor's Reputation

A broad experience in construction is a large asset, and is absolutely needed, but some owners and engineers insist on contractors having had special experience on the special line of work upon which they are making proposals.

Reliability and responsibility are always specified in public contracts. The laws governing the letting of contracts often read that contracts must be "let to the lowest responsible bidder." This is generally taken to mean that the bidder must put up a certified cheque, not necessarily his own, and must make the necessary bond. At times, however, his financial responsibility is looked into and the manner of carrying on his former contract. The writer knows of one case where a contract for a reservoir was not awarded to a contractor because on a previous job for the same class of work he had put a large number of empty cement barrels in an earthen dyke. The awarding board's decision was carried into the courts by the contractor, and the courts decided that a contractor who resorted to such practices was not reliable.

Ability is a varying quantity with an individual firm or corporation. Ability is the keynote to success. Many contractors could make public all their cost records, methods of doing their work, their system of accounting and carrying on their jobs, yet their competitors following in their footsteps with the knowledge thus gleaned from them would never achieve the same success due to the greater ability possessed by these contractors. A man, firm, or corporation of marked ability will always be well advertised and will always achieve success. Carnegie had many able assistants but it was his marked ability that made his company the most influential one in the steel business. Rockfeller, by his superior ability, made possible the Standard Oil Company, the greatest of modern commercial corporations. Numerous examples could be named in the contracting field.

A man of ability will realize that reputation for good work is a valuable asset. To use a common term, "skinning work" will injure a contractor. Everyone wants value for the money expended. It is possible to skimp some work without affecting its quality, but a contractor who follows specifications and plans will win more in the end than the one who believes he can fool the engineers. The reputation that contractors as a class are dishonest has been caused by some contractors believing they were able to make more money by ignoring specifications and skinning and skimping their work. It is the old proverb brought home again, "Honesty is the best policy." With honest work done by all, inspectors would soon lose their jobs, but from present indications inspectors need not worry about this matter.

The speed of carrying out contracts is an important consideration to all who have construction work to do. A contractor who gains a reputation for furnishing contracts on time has a valuable asset in obtaining work, both public and private contracts, and especially the latter. To further increase the speed of the work so as to finish ahead of the contract time, and even cut off a number of months, means to give a contractor an additional lever to land work. Upon one occasion the writer in bidding upon a job, on which a fourteen months' finish was asked by the engineer, suggested to the president of the company that the company, with which the writer was associated, could do the work within nine months and he offered to make it a bonus and forfeit job on such a basis. This practically landed the work and the job was finished so as to earn six days' bonus.

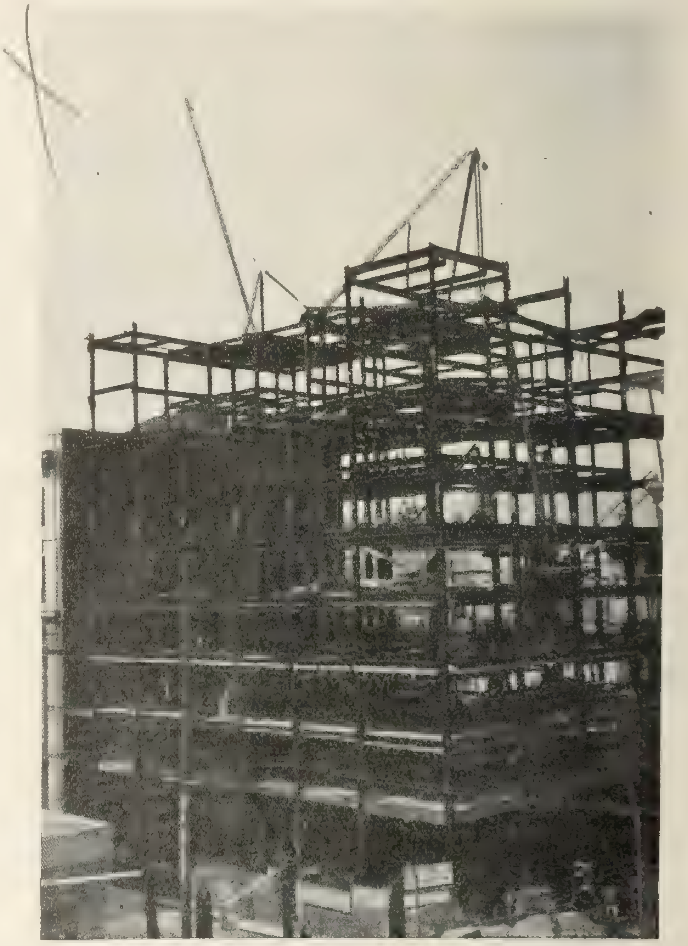
Men who are contentious frequently have a hard time in carrying out contracts, and lawsuits are generally brought by such men. A reputation of this kind is an injury. One or the largest contractors in the world is proud of his record that he has never brought a lawsuit against an owner.

The amount of capital that a contractor has plays an important part in obtaining and handling work. Just how much capital is needed for any certain job few contractors can agree upon, but with small capital only small jobs can be handled, and only a few jobs at a time, but with a large amount of capital many big undertakings can be carried on at the same time. These are self-evident facts. (*The Contractor.*)

Montreal Dominion Express Building

The new office building of the Dominion Express Company at the corner of St. James and St. Francois Xavier streets, is well on its way towards completion. The stone work, of light colored granite, of the first and second storeys is now in place and most of the floors, all of concrete, have also been laid. The building has a frontage of 120 feet on St. James street and 95 feet on St. Francois Xavier street. It will rise 130 feet above the pavement, providing 10 storeys above the street level and two basements below St. James street. The first two storeys and especially the main entrance on St. James street are very elaborately constructed and will, when finished, present a grand appearance. There will be two other entrances on St. James street. The upper 8 storeys will be finished in white glazed terra cotta with ornamentations of conventional design.

The Dominion Express Company and the Canadian Pacific Railway Company will have their offices on the ground floor. The rest of the floors will be rented as private offices, and the two top flats will contain the spacious and magnificiently furnished rooms of the Montreal Club. The top storey will be a pergola which will be enclosed and heated in winter, and used as a roof garden in summer. The entire building will be heated with steam by a vacuum process and will be mechanically ventilated. The heating, ventilating, power and refrigerating plant will be in the sub-basement.



Dominion Express Building, Montreal, Showing Steel Work

The main hall and the upper hall will be finished in marble, while the stairs and elevator shafts will be enclosed in grilles and wired glass. An enclosed fire escape, itself fireproof, will lead down to St. Francois Xavier street. The building will be connected with the annex now used as the St. Lawrence Hall by a bridge. Three hydraulic plunger passenger elevators will provide rapid communication to and from the upper storeys. The front of the basement will be equipped as a first class restaurant with entrance from St. Francois Xavier street. The rear of this floor will be used as an express storage room with entrance on Fortification Lane. There will also be a third class ticket office for the C. P. R. on this floor.

Duties of a Consulting Engineer

By Joseph A. Jeckell, M.I.E.E., Past President Electrical Club, Birmingham

It seems that it would be advantageous to consider what these really are. Surely the main duty of a consultant to his client is to obtain suitable work carried out at a fair cost, and not as some would seem to think, to prevent a contractor from making a fair and just profit.

To obtain the above, the consultant should:

1. Design the job to suit the work to be accomplished.
2. Design the job to cost as little as possible.
3. Draw up the specifications so as to allow of a satisfactory job being carried out without necessarily keeping absolutely to the letter of the specification.
4. Allow as far as possible each contractor to work in his own patterns. If standard patterns are used the cost will frequently be much lower than if specials are called for.
5. In any dispute between the contractor and the client, to hold the balance of justice impartially as he frequently has to be virtually, if not actually, arbitrator.

Surely it is not the duty of a consultant:

(a) To impose conditions of contract harder than is absolutely necessary to insure the faithful performance of the contract. It should always be borne in mind that all unnecessarily stringent conditions must increase the cost of the work, as contractors are not out for the good of their health only. Thus, extra capital is expended, a course to be vigorously avoided, as the more capital is expended the more interest and depreciation will have to be found, and many undertakings have failed from over capitalization. This should be carefully avoided in a new country where failure of an undertaking to earn a fair return on the capital invested will have a deterient effect on proposed undertakings.

(b) Nor to insist on patented or special articles being exclusively used without any option, as this enhances the cost, and there may be just as good apparatus made by other firms. This has a great tendency to curtail the number of firms likely to tender and should be avoided as much as possible, as firms not making these articles may be inclined to think things which of course are very far from the mind of the engineer.

(c) Nor to wring the last penny from a contractor or make him replace free of charge, goods which are found to be unsuitable, and this through no fault of the contractor.

Against Client's Interest

If a consultant gives this matter a few moments' consideration he will see that it is directly contrary to his client's interests to ignore the fact that contractors have to live and that by taking up an attitude antagonistic to them he is really working against and not for his client. This is easily demonstrated, because a consultant who issues specifications with unnecessarily stringent conditions as regards deposits, payments, guarantees, maintenance, retention money, etc., naturally receives many less tenders than one who takes a more broad-minded view of the matter. There is therefore less competition for the work. The price is higher than it otherwise would be, and not unfrequently the client is landed in a law suit at the end. The work not only costs the client more in money but also in worry.

Against Consultant's Interest

It has frequently been proved in actual practice that a fair-minded consultant will obtain plenty of tenders and at low figures, as men know they will be fairly treated and hence have not to put on an extra price in order to meet what may be demanded. The narrow-minded consultant who wants the contractor to place himself bound hand and foot in his hands, obtains very few tenders. These frequently are high priced to cover chances, and not from the firms of the highest repute, as they will not condescend to be treated in the way that the engineer has power to do under his conditions. A case is well known to the writer where in a large town for many years no builder in the city (and there were many good ones) would tender to specifications issued by the City Engineer, on account of the very absurd conditions contained in them. Thus the men who were helping to pay the City Engineer's salary were precluded from tendering for the work, if they had any self-respect. They willingly tendered for similar work carried out by other engineers in the same city.

If, on the other hand, the consultant, while fairly conserving his client's interests, is willing to meet the contractor in a fair manner, the contractor, who frequently knows as much about the work as the consultant, and sometimes more, will be willing to assist when difficulties arise, which they often do in every contract of magnitude. But the consultant cannot expect this assistance if he never considers the contractor at all, and grinds him down to the last penny.

In conclusion, if the consultant would bear in mind the proverb "Do unto others as ye would be done by," it would be better for him, his clients and other contractors, but possibly worse for the lawyers, as there would not be so many cases to come into court.

During the past few weeks an agitation has been going on among the carpenters of Montreal for an increase in the wage scale to a minimum of 40 cents an hour. The men had been getting from 27½ cents to 37½ cents an hour during the season, to July 1st. At the beginning of the year the employers promised an increase of 10 per cent. all round effective on July 1st. At a meeting held a week or two ago journeymen carpenters and joiners representing six local unions met and discussed the proposal to demand a minimum wage of 40 cents an hour. Some of the speakers represented that certain contractors had agreed to give a minimum of 35 cents. After the vote had been taken and counted it was given out by the labor leaders that two-thirds of the ballots favored a compromise and that the 35 cent rate would be unanimously accepted.

On the other hand the employers say that no increase has been granted except the 10 per cent. agreed to some months ago. The best men would be getting a little over 40 cents from the first of July to the end of the season, but the 27½ cents men would only get 30 cents. "However," said an employer, "if the men want it understood that they have gained something by their agitation we are not going round to explain or deny their statement. We are not going to split hairs over the matter." Work is going on as usual, the matter having been arranged without any delay

Notes on Construction of Masonry Dams

Settlement of Foundations a Grave Subject—Compressibility of Masonry Expansion and Contraction Due to Temperature Changes

In the presidential address of Edward Sandeman, president of the Association of Water Engineers (England), he took as his theme the construction of impounding reservoirs and especially the construction of masonry dams. His principal thought was the importance of studying and making allowance for the effect of both compressibility of foundations and masonry and temperature changes upon the masonry, and also the unit compressive strength adopted as a maximum

He said in part: I hope that in the future those who are engaged in masonry dam construction will devote especial attention to the recording of the amount of settlement in the foundations, and that, if possible, some information may also be gathered relating to the compression of masonry itself due to its own weight. It has generally been considered (and one authority at least lays it down as an axiom) that for a masonry dam it is absolutely necessary to have an unyielding foundation to build upon. But while such a foundation is no doubt an ideal one, it is to be remembered that all materials are more or less compressible and that settlement must always take place to some extent in the case of the hardest rocks, the amount being, of course, exceedingly small and without doubt difficult to accurate measurement. Masonry dams built upon shale and materials of a similar character must of necessity produce a compression greater than that produced upon harder rocks, and in these cases measurements of the amount of compression brought about by a given weight could be ascertained without much difficulty and the results recorded. It seems certain that, as the knowledge obtained from such observations accumulates, it will no longer be held that a masonry dam foundation must be an unyielding one.

It will not infrequently occur that the various parts of the foundation of the masonry dam, even when this is bedrock, will differ slightly in compressibility, and there must consequently be some adaptation of the masonry to the unequal yielding. Moreover, the compressibility of the masonry itself will probably not be the same as that of the rock, and consequently the settlement in sections of the dam which have different heights, owing to the variation in the depths of foundations, will differ. That masonry will adapt itself to pressure is known, but the extent of its adaptability had not, as far as Mr. Sandeman knew, been ascertained or calculated. Experiments made to determine the movement of high dams when subjected to water pressure have shown slight movements, in all probably bending movements and not due to a real motion of the dam as a whole. It seemed to him probable that when concrete was subjected to a continuous strain for a long period, its continuing to set more firmly through a period of years would enable it to gradually eliminate the strain and the concrete would take a permanent set in its final position and thus retain its full strength.

Movement Resulting from Changes in Temperature

Probably of greater magnitude than these movements and stresses due to compressibility is the movement due to variations in temperature. "It was formerly considered that temperature practically remained constant a few feet with a mass of masonry, but even in this country (England) with its moderate temperature, it has been found that 30 feet from the face of a dam there is a change between winter and summer of about 5 deg. Fahr. Close to the surface —say within one inch—the temperatures vary as much as 70 deg. Fahr. Contraction in masonry produced by low temperature is a much more troublesome thing than expansion and one which in large masses of masonry almost invariably produces cracks of smaller or greater dimensions." Mr. Sandeman referred to observations made on the Boonton, N. J., dam, 2,150 feet long, in which the sum of all the cracks measured was 3½ inches. He stated that if concrete were placed at a temperature of 60 deg., which was raised to 70 deg. by the chemical action and that this fell during the winter to 40 deg. in the masonry within 10 feet in from the face, this fall of 30 deg. would cause a theoretical contraction of about 2 inches in 1000 feet, which would cause a tension in the masonry of 21 tons per square foot, sufficient to cause cracks in almost any masonry. cracks thus caused commence at the top of the dam where it is thinnest and extend downward as the cold increases with a kind of tearing action.

The same stress exerted in compression by the expansion of the masonry could be resisted without injury and it has therefore been suggested that the masonry be laid in cold weather. But to do this would involve building in winter time only, which is an inconvenient and expensive method and liable to introduce more objectionable features due to the freezing of the mortar. Mr. C. S. Gowen, resident engineer on the Croton dam, suggested covering masonry built in the summer time with a thick coating of masonry placed in the early winter so as to prevent the development of cracks in the upper part of the masonry, and this Mr. Sandeman considered a valuable suggestion and quite practicable. That this consideration of the effects of temperature is not a heedless one is shown by the fact that nearly all masonry dams which have been constructed show sooner or later the effect of change of temperature.

In speaking of the limiting stresses in dam masonry he referred especially to the Croton dam, in which a stress of 14 tons at the base of the downstream face and 15 tons at the base of the upstream face were used in calculating the design. "Credit is due to the American engineers for their boldness in deliberately designing a dam which, while exceeding in height any existing dam by nearly 100 feet, at the same time was calculated to resist stresses so far in advance of anything previously contemplated. French engineers had already constructed dams in which the pressures on the base reached 6½ to 7 tons, and Rankine, in a report dated February 9, 1871, suggesting masonry dams in connection with the water supply of Bombay, had even fixed a limit as high as 20,000 pounds for the upstream base, although he limited the pressure on the downsteam base to 15,625 pounds for reasons which he set out, but this great increase in the limiting pressure on the masonry is a striking feature in the design of the Croton dam and one which engineers cannot do otherwise than admire. It is possible the designers were influenced in their decision by the known fact that greater pressures than those fixed by Rankine had already been borne safely by existing masonry. The granite ashlar in the Bear Valley arched dam in California is compressed to the extent of 40 to 50 tons per square foot, and even brickwork has been known to bear as much as 26 tons. Another good reason for increasing the compression limit is to be found in the greater strength now obtained from our cementing materials. So long as the mortar binding the stones of a dam together is weak, the compressive limit must be correspondingly low, for it may be taken that the stone used is stronger than any ordinary mortar; but in these days when cement is obtainable of a uniform character and high strength, there is no longer any reason to continue the compressive stresses to figures below those employed by our friends, the American engineers."

June Building in Montreal

During the month of June just past the Montreal City building inspector issued 323 permits for new buildings and 100 permits for repairs and alterations. The amount of money set down in the estimates for the cost of the new buildings was $1,550,365 and the amount of money estimated for repairs was $230,495, making a total of $1,780,860.

For the same period in 1910, 263 permits were granted for new work and 87 for alterations. The new work was valued at $1,430,028, and for alterations $155,226, making a total of $1,585,254, being an increase for this year of 73 permits and $195,696. The building operations for June included 621 dwellings and 9 factories.

If the actual values of the buildings for which permits were issued had been given doubtless the total amount for June would have reached at least two million and a half dollars. It has been the custom in Montreal amongst proprietors and in some cases, contractors and architects to underestimate the values of the buildings they are about to erect. This places Montreal in a bad light in comparison with other cities where the full values are given. Permits have been taken out in Montreal for buildings that have been estimated at only from half to two thirds of the real value. It is advocated by many persons in the building trade that when a building on being completed, exceeds the valuation set down at the time of a permit was secured the additional fees should be collected by the building inspector and the additional value kept track of until the end of the year, when the real value of the building operations carried on in the city could be arrived at much more accurately than is done at present. It is further suggested that fine should be imposed on persons making false entries. It is quite probable that this matter will be taken up by the commission which has in hand the revision of the city building by-laws.

New Montreal Edifice

The new Birks building to be erected at the corner of Union avenue and Cathcart street will be an ornament to a section of Montreal which possesses a number of fine large office buildings and commercial houses. The illustration shows it as it will appear viewed from Phillips Square. It will be a ten-storey building of first class workmanship and most modern design and finish. The Union avenue and Cathcart street facades will be simple but dignified in style, the only enrichment being in the first two storeys and in the large order which runs through the ninth and tenth storeys. The base is Stanstead granite, very massive, and rusticated. The upper storeys will be of grey Canyon sandstone. The entrance is flanked by monoliths of "Tenos" marble.

Particular attention has been paid to the main entrance hall. Its treatment is such as one meets with in the old Flemish palaces with high vaulted ceilings and simple groinings. In the wide, plaster wall-surfaces will be set subject medallions which are being modelled by Mr. Herbert, the sculptor. The floor, the high wainscot and the trim are all in marble. The hall runs through two storeys but the second floor corridors are connected by a gallery in one end. The corridors in the upper storeys will have tiled floors and marble door trim. There will be one freight and two passenger elevators. A clock, electrically controlled from a master clock will be provided in each office and the electrical equipment, besides providing light, will also furnish power when required by professional men. The building will be thoroughly fireproof throughout. The contract calls for the completion of the building by the first of April next. Messrs. Nobbs and Hyde are the architects and following are the contractors: Excavating, masonry and plastering, John Stewart; reinforced concrete, F. J. Jago & Company; roofing, G. W. Reed & Company Limited; plumbing, [illegible] McIntyre & Company. All of Montreal.

The Birks Building, Montreal

The North American Smelting Company proposes to begin next month the erection of a lead smelter at Kingston, to cost $36,000. The company has been awaiting the building of the Canadian Northern line which will run directly through its property.

Further Comment upon the Building By-law

Opinions Differ as to Several Items Mr. Wm. Fry Scott Expresses his Views—Comparison of the Toronto By-law with Requirements of the Joint Committee

Mr. Wm Fry Scott, consulting engineer and architect, takes exception to a letter published recently in one of the Toronto dailies regarding building conditions in Toronto. The letter referred to was written by Mr. Wm. Dobie, president of the E. W. Gillett Company, and was a severe criticism upon the present by-law. Mr. Dobie is of the opinion that local architects and builders have just cause for complaint, and he further states, subject to proof, that a structure costing about $200,000 in New York would likely cost close to $300,000 in Toronto. A new building was contemplated by this firm, but operations were delayed for several months in the expectation that the city authorities would do something in the way of modifying the various stringent regulations as applied to reinforced concrete. Mr. Dobie drew attention to the scarcity of concrete buildings in Toronto, and compared this condition with similar sized cities in the United States possessing as they do hundreds of such buildings. The letter went on to state:

"We fully realize the importance of having plans passed by the authorities, but if no system of this kind were in force it is hardly likely that any reputable concern would put a large sum of money into a building or number of buildings and construct them so poorly that they would collapse. In the interests of this city and its architects and builders, we claim that structures that are sufficiently strong to carry heavy loads in New York, Brooklyn, or other cities, should be sufficiently strong to carry the same loads in Toronto.

What Investigation Shows

"In our investigation we have discovered:

"(1) Curtain walls are specified fourteen inches in thickness in Toronto, in place of the eight-inch curtain walls used in Brooklyn.

"(2) Twisted steel must be figured in Toronto at 16,000 pounds per square inch, where it is figured at 20,000 in Brooklyn.

"(3) Girders must be figured rectangular in section where they are figured in 'T' sections in Brooklyn. This makes the girder very much larger than is used there, in some cases as much as twice or three times as large.

"(4) Columns are specified for an allowable stress of 350 pounds per square inch on the concrete, and 12,000 pounds on the steel, which would add from 50 to 100 per cent. over the cost of material in a hooped column.

Cost of Material

"In the cost of material we find:

"(1) That cement which costs approximately $1.65 per barrel in Brooklyn, will cost $1.95 in Toronto.

"(2) Sand which costs from 60 cents to 70 cents in Brooklyn, costs 90 cents in Toronto.

"(3) Gravel which costs around $1.40 in Brooklyn, costs $2.20 in Toronto.

"(4) Steel costs are also 20 to 30 per cent. higher in Toronto than in Brooklyn.

"These figures show that the costs of material on such a job as we propose to build would run very much higher in Toronto. Labor in some instances is a little cheaper, but as a rule the grade of labor is inferior."

In reply Mr. Scott, speaking from considerable practical experience obtained in New York and Toronto, acknowledges that there is need of a revision of the by-law for reinforced concrete, but goes on to say that conditions are not so bad as those who read Mr. Dobie's letter or the Citizens' Memorial are led to believe. Mr. Scott's letter reads as follows: Editor, Contract Record:—

Thickness of Curtain Walls

I am inclined to think there is something in the contention as to the thickness of the curtain wall, and as a matter of fact the question was brought to the notice of the Mayor and Board of Control in the year 1907 by the Board of Trade and others when the provision of the old city by-law was maintained. In some types of buildings the difference is more serious than in others, but in the most extreme cases that can be cited it will not involve an excess of more than 5 per cent. on the entire cost of the structure.

Allowable Stress in Steel

"Second, with regard to the question of the allowable stress in the steel as referred to in Mr. Dobie's item 2, let it be granted for the purpose of examining this question that allowance should be made, under some conditions of 20,000 lbs. per square inch on the steel, instead of 16,000 lbs. as required in the by-law. Now what effect does this have on the cost of the finished structure? The cost of the reinforcement alone does not exceed, say eight per cent. of the total cost of the structure, but suppose we say ten per cent., so as to give Mr. Dobie the benefit of all doubt, then we find that this item affects the cost of the structure by only two per cent. This item is very slight in its influence, and it can be said that many other influences that depend upon the personal equation of the contractor in charge of the building operations, more than offset it and make it sink into comparative insignificance.

I would like to point out that there are a few cases in actual work where a conservative designer who considers actual costs of the totals of his materials rather than the costs of occasional items, such for instance as steel, as being one item of several that go to make up reinforced concrete, would use so little steel as to stress it much above 16,000 pounds per square inch, which is allowed by the present Toronto by-law.

With regard to Mr. Dobie's items concerning T. beams, I hold that the regulations laid down by the Joint Committee on Concrete and Reinforced Concrete are considered as representing the best and safest regulations of the day, and it is my opinion that they should be adopted until such time as they may be improved upon, although they are not stringent enough on the question of bonds, and in private practice I use what was found to be safer values; but, in the main, I believe these regulations to be the best yet produced. Now, comparing the Toronto by-law with the Joint Committee's regulations on T Beams, it will be found that for actual practice the Toronto by-law will permit an even greater overhanging width of T beam than the Joint Committee's regulations will require. The Joint Committee's regulations on T beams are these:

"In beam and slab construction an effective bond should be provided at the junction of the beam and slab. Where the principal slab reinforcement is parallel to the beam, transverse reinforcement should be used extending over the beam and well into the slab.

"Where adequate bond between the slab and web of beam is provided the slab may be considered as an integral part of the beam, but its effective width shall be determined by the following rules:

(a) It shall not exceed one-fourth of the span length of the beam.

(b) Its overhanging width on either side of the web shall not exceed four times the thickness of the slab.

"In the design of T beams acting as continuous beams, due consideration should be given to the compressive stresses at the support."

The Toronto by-law requirement on T beams is as follows:

"The floor plate to the extent of not more than five times the width of any beam or girder may be taken as part of that beam or girder in computing its moment of resistance."

Now assume the most common span in use in buildings to illustrate the application of the two regulations and see what effect they have. Considering a floor panel of 20-foot span it is evident that the Toronto by-law will permit the effective width of the T beam to be 6 feet when the beam width is 1 foot. Now what does the Joint Committee allow for such a case? They allow one-fourth of 20, or 5 feet, as a maximum, and there is a further restraint that the overhanging width must not exceed four times the thickness of the slab. This shows that the Toronto law really allows a greater use of T beams than conservative practice warrants. Thus, Toronto reinforced concrete should cost less rather than more in the requirement for T beams.

The By-law and Practice

The writer believes that the difference between correct practice and the more or less empirical demands of the by-law in these matters, is much less than two or three per cent. in their effect on the cost of a reinforced concrete structure. In fact, the difference is just as apt to be on one side as on the other, because builders have been knowingly or unknowingly misleading themselves as well as others on these questions. Thus it can be proven that greatest possible excess of cost due to stringency in the requirements of the Toronto building by-law, does not exceed six or seven per cent. of the total cost of any building. And the writer believes that the average does not exceed two per cent. on all types of buildings affected by this by-law.

The Cost of Cement

"With regard to the question of cost of cement in Toronto, it is true that few barrels of cement may possibly cost $1.95 per barrel, but Mr. Dobie will find that he can obtain large quantities of cement in carload lots for $1.55 per barrel. This, then, is less than the cost in New York, according to his price. However, it must not be forgotten that there is usually more cement in United States barrels than in the Canadian barrels, although this difference does not materially influence comparative values as they really stand.

Cost of Sand and Gravel

"Mr. Dobie states, among other reasons, for excessive cost in Toronto, the increased cost of sand and gravel but admits labor to be less here than in New York. This is true, but his point will be quite lost if it is realized that the cost of labor on concrete and form work amounts to over one-fourth of the cost of the entire building, whereas, the excess cost of sand and gravel is of no practical consideration. Therefore, the saving in cost of labor should and does help to meet the excess charges he speaks of.

"His letter also suggests that if no system were in force of having plans passed by the authorities, it is hardly likely that any reputable concern would put a large sum into a building or number of buildings and construct them so poorly that they would collapse, and further says that structures that are sufficiently strong to carry loads in New York and Brooklyn or other cities, should be sufficiently strong to carry the same loads in Toronto. Quite so, but this does not prove that the requirements in New York or Brooklyn should necessarily be blindly followed here.

Brooklyn and Manhattan

The building requirements in the borough of Brooklyn have in the past, to the writer's definite knowledge, been notoriously lax on the question of reinforced concrete, and these requirements are entirely different from the requirements in the borough of Manhattan, the borough in which the head municipal offices of Greater New York are located. It should, however, be remembered that separate building regulations have in the past existed for these two separate boroughs of the greater city of New York, and the Brooklyn regulations have been as notoriously weak as the Manhattan regulations have been notoriously conservative. The Toronto regulations as they now exist conform more or less to the old original Manhattan regulations, which were the first to be adopted on this continent. The latter are no more conservative than they should have been in the light of knowledge of the subject when they were prepared. The latest and most modern and accepted regulations on reinforced concrete may be considered as a mean between the two extremes represented in the Brooklyn and New York requirements, and the rank and file of the engineering profession have put their stamp of approval on them. Therefore they should be adopted in Toronto until such time as something better is proposed and accepted by the technical world.

Revision Must Be Careful

"Thus, while it is true that we do need a revision of the building by-law on reinforced concrete, on curtain walls and on other questions more or less important, it is also true that we do not want these questions revised to suit unscrupulous exploiters of special materials who make their profit out of the deception they are able to perpetrate on the may for whom they build. The buildings built by these men do not always fall down—they usually hang on the verge of collapse, however, and at best the owner seldom gets a building that is adapted at all times to the use he had intended for it. Most of them are deceived in one way or another, and have been led to the same conclusions as Mr. Dobie. Therefore we need a conscientious City Architect to protect these men against themselves, and in the interest of public safety a City Architect is absolutely necessary, and a conservative one is preferable to none at all, as suggested by Mr. Dobie. This would still be true if some few buildings did actually cost even ten per cent. more than buildings built by careful and experienced architects and engineers without city supervision. Mr. Dobie's whole statement fails in its convictive force because of his suggestion to do away with city supervision.

Improvements Only Recent

"In plain justice to City Architect McCallum, it should be stated that it is only recently that more approved regulations than those in the present Toronto by-laws on reinforced concrete have been generally accepted by the engineering profession, and even those regulations have not been unanimously approved—a minority report was attached to them.

"The City Architect should be given credit for the work he has done in building up his department. He may be slow to adopt new developments in construction, but we should not forget that he is made responsible for our public safety, and who can say that he has not been a zealous worker and faithful to that trust?"

A Few Points for the Concrete Contractor

Wet Concrete and Dry—Joining New Work to Old—Coating Forms—A Collection of Valuable Pointers

The placing of concrete is a matter requiring considerable care. Forms should be perfectly clean and be free from sawdust, which is very hard material to get rid of. Care should be taken that no dirt falls into the concrete, a point that is often overlooked by workmen. At the north end of joists, beams and girders placed north and south, and at the west end of joists, beams and girders placed east and west, there should be holes cut in the bottom forms, through which to brush the dirt and dust before placing concrete. At the bottom of the column forms holes should be made through which to clean out sawdust and dirt of all kinds, and the holes should be on the north side.

Holes in Column "Forms"

The reason for mentioning north and east is that this is the practice of the writer. Any other location is as good, but there should be a system established and strictly adhered to. It is essential that the holes be filled before the concrete is poured, and men sent to fill the holes should find them with the fewest lost motions. When a certain location is established, then the holes will be quickly found. This is one of the little points making the difference between profit and loss in contracting work. For stopping holes in the bottom of forms pieces of tin are good. They can be made from old tin cans or obtained from a nearby tin shop, and short nails can be used to fasten them over the holes. For holes cut in upright forms a secure plug is made of a piece of wood, a little smaller than the hole, with a piece of tin fastened to it and projecting over the edges. It is inserted in the hole with the tin on the inside and a small wedge placed between the side of the plug, and the edge of the hole, will hold it in place until the concrete rises to that level, after which the pressure of the concrete will hold it.

Forms must be strong enough to retain wet concrete, which exerts a pressure equivalent to a fluid weighing 80 lb. per cu. ft., or it must be strong enough to withstand the pressure due to tamping in case a "dry" concrete is used. Years ago "dry" concrete was almost universally used. The cement, sand and aggregate were dampened to such an extent that a handful, when squeezed, would retain its shape, but the hand would not be wet or stained and the lump would fall to pieces when shaken. It was like moist brown sugar. When concrete block machines were first introduced this quality of concrete was advocated because the forms could be removed within a short time. The claim was made that it was stronger than "wet" concrete. Some men still make that claim. When "dry" concrete was deposited in forms it was required that it be tamped until the moisture rose to the surface and the concrete quaked. It was really remarkable to see how little water was required to make a mushy-looking concrete after considerable tamping.

Amount of Water in Wet Concrete

Wet concrete contains water in varying degrees. It ranges all the way from a concrete having slightly more water than what is termed "dry" concrete to a concrete so wet that it runs like cream. In the days when "dry" concrete was common it was believed that an excess of water caused the materials to separate and the cement to settle to the bottom. The truth about the right amount of water is that the best and strongest concrete is that in which the consistency is that of a thick soup. Soup is of two kinds, bouillon, which is thin and watery, and broth, which is thick. When soupy concrete is mentioned it is of the broth and not of the bouillon variety of soup that one speaks.

Wet vs. Dry Concrete

Wet concrete is more economically placed than dry concrete, for it is mixed in a shorter time and requires no tamping. It settles readily into all corners and crevices and thus presents a finer appearance on the surface. Better appearing work can be done with a flowing concrete. When concrete had to be thoroughly tamped in was hard to figure on the strength of forms, and bulging forms were common. With wet concrete the pressure is always uniform and can be calculated and the forms designed accordingly. When the concrete is reinforced dry concrete cannot be used, for it is absolutely essential that there be no displacement of the steel or disturbance of the bond between the steel and concrete. If dry concrete, with the necessary tamping, is used, the steel will generally be moved a little and the bond between the steel and the slowly-setting concrete will be disturbed. Wet concrete, which flows readily around the steel, is the only concrete to use with reinforcement. Thousands of tests have demonstrated that there is no tendency on the part of the cement to settle to the bottom and separate from the aggregate and sand if the concrete is of the proper consistency.

The writer commenced concrete work about 25 years ago when dry concrete was the only kind permitted. He was discharged from one job 23 years ago because he permitted the foreman to use a wet, mushy concrete in filling certain pier forms. He received a few weeks ago an apology from the man who discharged him, but that does not recompense him for the loss he suffered at the time for what was termed his "ignorance and carelessness," and which he thought was progressiveness. It was not uncommon in old-fashioned dry work to find in the interior of walls, when torn down, lumps of unset materials which had been rolled up into balls coated on the outside with cement, these balls having been formed during the mixing process. When a large amount of water is used such balls cannot form.

Strength of Dry Concrete

Dry concrete is not stronger than wet concrete. Hundreds, perhaps thousands, of experiments have conclusively proven this idea to be wrong. The results of these experiments have been published over the names of responsible and well-known authorities, so there is no reason to keep the old idea running. Dry concrete obtains a certain degree of strength in a shorter time than it takes wet concrete to obtain the same strength. This enables forms to be removed sooner with dry than with wet concrete. Wet concrete and dry concrete placed in the same day are of practically equal strength at the end of 30 days, but at the end of the first four or five days the dry concrete is the stronger. After 30 days the wet mixed concrete gains rapidly in strength, as compared with the dry mixed concrete, the latter picking up in strength if wet with a hose or otherwise drenched with water. Concrete requires water in order to set and harden properly, so the necessary water must be supplied during the mixing period. Three months after mixing the wet concrete is much stronger than the dry concrete, and it always retains this advantage, but as the years go by and the dry concrete has an opportunity to absorb moisture, and the wet concrete gradually loses excess moisture, the difference becomes small. For quick strength use as little water as will make good concrete. For permanent strength and low cost in mixing and depositing, use wet concrete. Wet concrete is much more uniform in strength than dry concrete, and plenty of water is required to harden concrete. In summer a certain excess of water must be used to supply the loss caused by evaporation and the absorption of water by the sand and stone. In winter a much smaller amount of water should be used in order to obtain quick setting and thus avoid danger of freezing.

The foregoing matters have been touched upon several times, but they are very important. The forms should be tight in which concrete is deposited. The surface of the wood next the concrete should be smooth and the edges of the boards closely fitted. The forms should be thoroughly wet before the concrete is deposited in order to make the forms swell and thus close the joints and prevent leaking. Another important reason for wetting the forms is to prevent them absorbing water from the concrete which it requires for setting and hardening. Use no oil on forms. Oil is nasty and the atmosphere seems somehow to become filled with oily vapor after a few days of its use. It sometimes discolors the face of the concrete and it is always difficult to properly treat surfaces which have come in contact with oiled forms. It is impossible to get rid of the thin oily coating and it is impossible to make plaster stick to an oiled surface. The writer uses plain water or soap. Common soap can be melted in hot water or soap oil can be purchased from the nearest soap factory. It is applied with a brush and does not injure the surface of concrete. It helps make it waterproof and can be washed off with water when fresh so that plaster can be applied.

Whitewash for Coating "Forms"

Common whitewash is a fine material with which to coat forms. It would be difficult to find anything cheaper and it is really very efficient in preventing concrete from adhering. If wet concrete is poured against dry forms large areas of surface will be pulled off with the forms, so that some coating is necessary. In the order of cheapness and merit the coatings stand about as follows: Water, whitewash, soap, oil. In the order of practicability they stand as follows: Whitewash, soap, oil, water, for water is apt to dry out during the filling of a high form and more water cannot be added without thinning the concrete, already poured and possibly injuring it. The writer prefers soap to all the coatings he has used.

The stopping of joints which open in forms is accomplished partly by the use of water to cause the wood to swell and partly by filling the joints with some material. The writer has found nothing equal to mud paste. A clay of some sort can generally be found in the vicinity of every concrete job, and it is an easy matter to mix it with the paste and fill all cracks. Sometimes a long time intervenes between the placing of the clay and the pouring of the concrete so the clay dries up and falls out. Some contractors use thin oil with which to mix the paste instead of water; and this is generally satisfactory. The writer has used oil and has also used thin soap or very heavy soapy water. This is cheaper than oil and much more readily mixed with the clay. Some fibre or hair mixed with mud paste makes it possible to use it in filling quite large cracks, although the use of fibre is not common. The writer has used it on several jobs with great satisfaction.

Concrete should be deposited in thin layers and be well tamped if dry; and well puddled with sticks or rods if wet, in order to fill all crevices and insure that all aggregates are coated with cement mortar. When concrete is poured in at the end of the form and permitted to run down a slope there is bound to be a separation of materials, the large pieces freeing themselves from the mortar and running ahead of it, the slow-moving mortar generally setting before it gets an opportunity to cover the faster-moving aggregates, thus making porous places in the mass. When work is stopped all joints should be vertical.

Joining New Work to Old

When work is resumed the face of all joints should be washed thoroughly and then be coated with a neat cement wash. When the fresh concrete is poured it should be well spaded against the old face. Beveled strips placed in the edge of all work help to make keyed joints when work is resumed. To obtain a smooth face do not depend too much upon coats of plastering, but try and get it in the forms by using a perforated concrete spade or a potato fork to work in next the form and press back the large stones so the mortar can work to the front. This is very good when making curbs and walls. For the top surface of curbs and walls, as well as for many floors and sidewalks, use a tamping device made on the principle of a wire potato masher to push down into the mass all large stones and thus force the thin mortar to the surface. Smooth it off with a long board on edge and then brush it over with a stiff broom instead of floating it. A lean mixture is generally used in the body of sidewalks and floors for the sake of economy. Sometimes it is cheaper to use a richer mixture all the way through and treat it as above described, thus saving the high-finishing expense.

The reason difficulty is experienced in making new work join to old is that not sufficient care is used in getting the old faces clean. Washing with water is not sufficient and brushing is not sufficient. A wire brush is not always satisfactory, for it produces much dust, and this is not always washed off. The writer uses steam under high pressure on large jobs, for it will certainly clean off the concrete as nothing else will. If the job is not large enough, then use wire brushes and plenty of elbow grease, following with water applied through a hose. On jobs where steam cannot be had then a solution of acid should be used to get the concrete perfectly clean. If reinforcing is used do not use acid, but do the best work possible to make a good joint without it. When the top of a wall is setting cement paste is forced up to the surface and this sets and becomes dead, the product being known as "laitence." It is this laitence that makes the trouble. Sometimes men make a mixture of sand and cement 1 to 3 perfectly dry and pour it over the top of a wall a few minutes before work stops and puddle it well, so that as the cement paste rises it mixes with this dry material and a semi-porous coating is formed on top which contains little or no dirt. When starting work the next morning a thin paste of cement and water is placed over the top, and then on this a cement mortar 1 or 2 in. thick. The concrete follows quickly and the result is generally a first-class joint.

Applying Plaster to Face of Concrete Work

In applying plaster to the face of concrete work an attempt must be made to get a surface with a good suction, as painters term the property that makes a surface eat up paint. The surface should be first gone over with a wire brush, and this should be followed with a wash of weak acid, such as strong vinegar, sour beer, a weak solution of hydrochloric acid, etc. Then go over it several times with a wide brush dipped in water until the surface is damp, but not wet. Do not use a rich mixture for the plaster. Use 1 part of cement to 3 parts of clean, coarse sand. Put the first coat on thin and scratch it. Apply with a hard pressure and let it set until strong enough to carry the next coat. Before applying the next coat wet the first one and then apply the second in the same way. Three coats will generally be sufficient. Avoid as much as possible the working of material more than merely enough to make it adhere. A lean mixture gives far better results than a rich mixture and is not so liable to show hair cracks. Quick setting causes hair cracks and a rich mixture sets quickly.

Concrete Arch over Tiber

The 328-foot reinforced concrete arch bridge across the Tiber at Rome, Italy, was opened for traffic on May 12 of this year. As has been stated before, this is the longest span masonry arch bridge yet built, surpassing by 8 feet the Grafton concrete arch at Auckland, N.Z., and by 33 feet the Plauen arch in Germany the largest stone voussoir arch in existence. A recent article in "L'Ingegneria Ferrovaria," of Rome, describes the construction of the bridge briefly, but does not take up the design in any detail. The bridge is intended primarily to provide a passageway over the Tiber to an exposition that is to be opened this summer and was not projected until about May, 1909. The time for its necessary completion was then very short so it was at first thought best to build a wooden structure. This was opposed by the municipal authorities who desired a permanent bridge at just this location, so it was decided to build the bridge of reinforced concrete,as being both rapid in construction and permanent in character. Many studies were made for the design of so extraordinary a span, and the design submitted by "La Societa Porcheddu Ing," was accepted after a conference of a special commission appointed for the purpose. The contract under this design was awarded to a firm composed of Messrs. Porcheddu and Bentivegna for the sum of 1,250,000 lire ($238,000), and work was started on November 11, 1909.

The bridge consists of a single arch span across the river, 100 m. (328.1 ft.) in span and 10 m. (32.8 ft.) in rise, and has a roadway 43 feet wide flanked on either side with a 10-foot sidewalk. It comprises seven separate no-hinged arch ribs, each 20 cm. (8 ins.) deep at the crown and 50 cm. (20 ins.) deep at the spring and 20 cm. (8 ins.) thick throughout the arch span, widening to a thickness of 30 cm. (12 ins.) in the continuation into the cellular abutment. All of the arches are tied together with transverse and horizontal diaphragms and are topped with a reinforced concrete slab forming the roadway. The abutment is of the cellular type resting on a concrete slab bottom which in turn is founded on piles formed by the "Compressol" system. The ribs and diapragms are reinforced throughout, though the amount of the reinforcement is not available to us at present. The bridge was designed for a load over the entire surface of 500 kg. per square m. (100 lbs. per sq. ft.) and a rolling load of three 16-ton road rollers.

The city of Montreal has awarded to F. H. Hopkins & Company a contract for a supply of their special Ransome street concrete mixers equipped with electric motors, two one-half cubic yard and two three-quarter cubic yard capacity mixers. These will be the first concrete mixers of this type used in Canada and will have towers and a special scoop and will discharge over the ends. This type of machine is used by Messrs. Laurin & Leitch, contractors, the Sicily Asphalt Paving Company, and the city of Hamilton, but the motive power in the last three named cases is either gasoline or steam, instead of electricity.

Montreal Notes

The Town of Outremont and the City of Westmount are considering the subject of placing electric wires under ground.

The Montreal City Controllers have called for estimates of the cost of macadamizing Sherbrooke street from Westmount to Montreal West, a distance of about three miles.

The Montreal Locomotive Company has received an order from the G. T .P. Railway Company for the construction of forty-five locomotives, being 15 Pacific, 20 consolidated, and 10 switching engines.

The officials of the Town of Montreal South recently decided to increase the wages paid to laborers on corporation work from 16 cents to 17½ cents an hour, owing to the difficulty in obtaining enough men at the previous rate.

The City of Westmount has just passed the second reading of a very stringent by-law dealing with the handling of explosives. This by-law forbids persons under sixteen years of age or intoxicated persons to carry this commodity, and prohibits street cars or other public conveyances being used to convey it thorugh the city.

The Town of Montreal South has received an offer from Messrs. Gillespie & Ross to put in a water system, including drainage, to build cement sidewalks and to accept in payment the town's debentures for 44 years at five per cent.; the plant to become the town's property whenever the work, or any part of it, is completed. A similar offer was made to the Town of St. Lambert.

On the report of the town engineer of Outremont the council decided to order 6,500 gallons of asphaltoline, a dust-laying preparation which the official highly recommended, and which costs 7½ cents a gallon. The streets of the town will be treated with this preparation so far as it will go, by way of experiment. The proposal to purchase a new street water sprinkler was lain aside until it would be seen whether the new treatment was satisfactory.

The council of the Town of Outremont has adopted a by-law authorizing the purchase of lands for parks and playground space to the value of $175,000. The citizens seem to favor the establishment of several small parks for the use of the juvenile section of the community rather than one large park, which seems to be a wise decision, seeing that Mount Royal park can be reached within a few minutes from the farthest boundary of the municipality.

The Town of Longueuil has been successful in a suit taken against the Town of St. Lambert for the purpose of preventing the latter municipality from emptying its sewage into the River St. Lawrence in such a manner that it would flow past Longueuil, endangering by pollution that town's water supply and constitute a menace to the health of the citizens. As a consequence the Town of St. Lambert is under the necessity of establishing a sewage purification plant. This subject is now being studied by the Town Engineer, Mr. Dickison.

The Canadian Hassam Paving Company, Montreal, has taken out an injunction to prevent the city controllers from giving a contract for paving to the Hofeller Paving Company, whose tender was higher than that of the Hassam Company. Growing out of the dispute is a libel action taken by Controller Wanklyn against Mr. Oliver Asselin, secretary of the Canadian Hassam Company, it being alleged that Mr. Asselin had made statements in newspaper articles and interviews calculated to damage Mr. Wanklyn in his reputation and standing as a controller, Mr. Wanklyn having been charged with showing favoritism in connection with the award of the contract.

Canadian City Engineers

Lucius E. Allen, Belleville, Ont.

Mr. Allen was born in 1877 in Chautauqua, New York, and was educated in Jamestown, New York, High School. He received thorough military training and served in 1898 with the 65th Regiment of Buffalo, N. Y. He entered the University of Michigan in 1898 and followed a full course in the University, receiving degree if Bachelor of Arts in Science in 1902. Later he was appointed an Assistant on the Faculty of the University during the last year of residence at the University, and carried on special research work under Dr. George A. Hulett, now of Princeton University, and Prof. Edward D. Campbell of the University of Michigan.

Mr. Allen accepted a position as Chemical Engineer of the Crescent Portland Cement Company, Wampum, Pa., on leaving University. In 1904 he resigned to assist in formation of the New Castle Portland Cement Company, New Castle, Pa., and was actively connected with the work of laying out and constructing a 1,500 barrel Portland cement plant, a 1,000 ton per day capacity rock crushing plant, and a modern hydrated lime plant for the above company, from its inception till purchased by the Lehigh Portland Cement Company, Allentown, Pa.

Lucius E. Allen, Belleville, Ont

In 1905 Mr. Allen removed to Belleville, Ont., assuming full charge of the production end of the Belleville Portland Cement Company, Limited, and rearranged the process of manufacture and improving the quality of the product to equal any on the market. In 1907 he was appointed General Superintendent of the above company and Superintendent of the Belleville & Point Ann Railway. During this time the entire plant practically doubled in size, and it has since been purchased by the Canada Cement Company, Limited.

In 1908 he resigned the above position to organize the Ontario Limestone and Clay Company, Limited, and is at present Managing Director.

For the past few years Mr. Allen has undertaken a limited amount of general engineering work outside of business connections. As County Engineer for the County of Hastings he has charge of all new bridge work in the county. Approximately $120,000 of new bridge construction consisting of steel and reinforced concrete bridges are now in course of construction. He is also consulting engineer for the Corporation of Deseronto, Ont., and the Raglan Corundum Co. and last season carried on extensive engineering work involving the valuation and testing of two operating coal mines in Nova Scotia and a large cement property in Quebec.

Mr. Allen is a charter member of the American Institute of Chemical Engineers, National Cement Users Association, Canadian Cement and Concrete Association, Ontario Good Roads Association, the Chemists Club, New York City, the Ontario Club, Toronto, and other societies.

He has presented and published articles and papers in engineering and technical journals on The Solubility of Gypsum; The Waterproofing of Concrete; The Manufacture and Uses of Hydrated Lime; The Design and Construction of Reinforced Concrete Bridges; The Reconstruction of the City of Kingston Gas Holder, etc., etc.

Personal

Mr. Alcide, chief building inspector of Montreal, has received notification of his appointment as a member of the committee on fireproof construction, including concrete work, of The National Fire Protection Association. This association embraces most, if not all of the fire underwriters' organizations of the United States and Canada. Prof. I. H. Wooson of New York is the chairman of the committee.

Mr. A. C. D. Blanchard has been appointed to the position of City Engineer for Lethbridge, Alta. Mr. Blanchard is an engineer of experience in municipal engineering. For the past four years he has been connected with the engineering department of the City of Toronto in the capacity of engineer of the new construction in the department of special works. He engineered the work on the shore protection, and later had charge of Toronto's main drainage system and storm sewer system, at a cost of $3,500,000. Prior to going to Toronto Mr. Blanchard was consulting engineer of the Niagara Electric Company, and of the Kootenay Power Company at Bonnington Falls.

Trade Notes

Corbett Machine Company, of Owen Sound, have been awarded the contract for erecting a 72-foot steel bridge at Harrison, Ont.

A by-law to appropriate $150,000 for the University of Calgary for the purposes of erection and equipment was carried by a large majority.

The Canadian Harvester Company are contemplating the erection of a 90 by 300 foot solid brick assembling warehouse at Fort William, Ont.

The ratepayers of Woodbridge, Ont., have carried a by-law to raise $40,000 by debentures for the construction of the bridge over the Humber river.

The city of Brandon propose electrifying their present steam plant and installing two 2,000,000 gallon variable speed pumps, adaptable also for electrical operation.

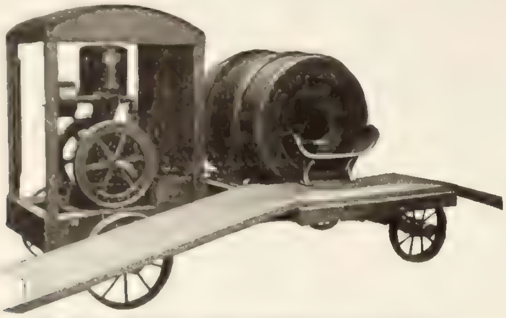
The American Cyanide Company, of Niagara Falls, Ont., have started work on the extension of their factory. Work is being done by day labor and includes the installation of electric furnaces, retorts, cranes and conveyors.

A Canadian branch of the Brake Beam Company is being established in Brantford, Ont. A number of laborers are at present at work erecting the machinery and it is expected the first order for some 4,000 brake beams will commence at once.

Business Notes

Eclipse Concrete Mixer

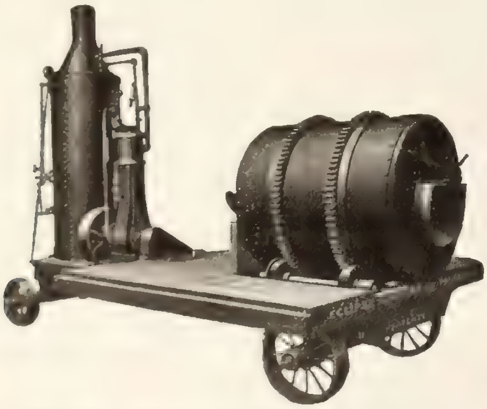
The Eclipse low charging concrete mixer is a machine especially adapted for various classes of work and is at present attracting large attention from the concrete contractors throughout the entire country. Its special feature is the low charging open drum, which makes it necessary for the charging platform to be only 24 inches high when mounted on truck, and the outfit is always complete and ready for operation as soon as it arrives on the job. It is only required to wheel the material on this platform and a barrow can be run up a 12-foot plank almost as easily as on the ground. The material from the barrow is thrown into the drum very quickly, on account of the large opening in it.



Gasoline Driven Eclipse Mixer on Truck

An advantage of the large opening in the charging end of drum is that the entire batch can be seen while mixing and it can be determined before discharging that the concrete is in the exact condition desired. The fact that the entire batch can be seen while mixing enables the contractor to produce uniform high grade concrete, insuring good reputation for first-class concrete work, which is very important. The interior of the drum is also easy of access for any purpose.

One other feature about the Eclipse mixer is, that it will operate on either wet or dry mix and with any kind of material. It can also be used for mixing cement mortar or top dressing for sidewalks, the smaller sizes being especially adapted for sidewalk work, where the light portable machine is preferable. A superior quality of cement mortar can be made at a much lower cost than when mixing by hand. High-grade mortar is always secured. The Eclipse is also used for mixing tar products, such as westrumite, etc., which are more difficult to mix than ordinary concrete.

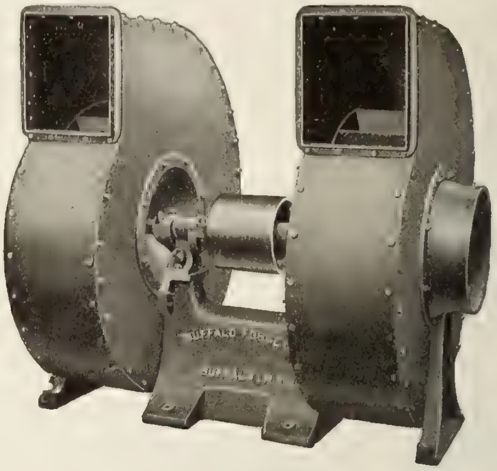


Eclipse Concrete Mixer, Steam Driven.

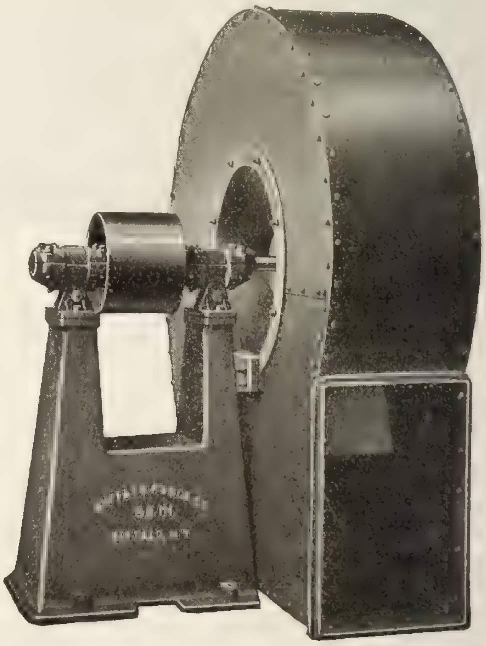
The Standard Scale & Supply Company, 1345-1347 Wabash avenue, Chicago, Ill., manufacturers of the Eclipse concrete mixers, are prepared to supply all orders from stock; also desire to secure agencies and representation in different sections of Canada.

Interesting Running Record of Exhaust Fan

The Canadian Buffalo Forge Company, Limited, Montreal, has perfected a slow speed multi-blade exhaust fan which has proven exceptionally economical in power consumption. Three double fans of this type, for some time in use by the Cutler Desk Company, furnish a striking example of their efficiency which is above anything heretofore heard of in the line. The Cutler people discarded three double fans, of a well-known make, practically new, and in design and construction regarded as inferior to none on the market. Their power consumption was 40 h.p. The new "Buffalo" fans, performing the same amount of work, are using 21 h.p., practically only one-half. Figuring power at $35 per h.p. per year, this gives a saving of $665 per year with the three fans, which, applied to the purchase price, exceeds a return of 100 per cent. per annum on the investment.



Multiblade Slow Speed Exhaust Fan of Double Type.



Multiblade "Buffalo" Exhaust Fan of Single Type

This high efficiency is attributed to the design of the fan wheel, which is of the multiple type, and to its proportions, which give maximum efficiency at speeds averaging fully 30 per cent. below the normal for exhaust fans. The slow speed is a very important feature. It reduces power consumption, minimizes wear and cost of upkeep, and lengthens the life of the fan.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Alliston, Ont.

Materials required for waterworks. Owner, Waterworks Department. This department is still inthe market to purchase 3 to 400 feet 5 to 6-in. iron pipe, also a reductor.

Ayr, Ont.

Tenders called for roadway. Owner, Village of Ayr; reeve, H. Gemlin, Ayr. Construction of about 2,282 lin. ft. of macadam road. Crushed stone, gravel and tile furnished by the corporation. Tenders received until noon, July 17th.

Burnaby, B.C.

Petition to be presented for highway road. Owner, Municipality of Burnaby. City clerk, W. Griffiths. The council adopted councillor Rumble's motion to petition government for a 66 foot road along B. C. E. Railway's right of way from Paterson road to Vancouver road.

Cardston, Alta.

Tenders called for waterworks, $40,000. Engineer, R. E. MacArthur, Lethbridge, Alta. New system gravity, 35,000 ft. 10-in., 8-in., 6-in. wood pipe hydrants, valves and excavating. Tenders were called on July 8th.

Dresden, Ont.

Tenders called for waterworks. Owner, Corporation of Dresden; Town Clerk, J. T. Bridgewater; consulting engineer, F W. Farncombe, C.E., 64 Bank of Toronto Chambers, London. 4-in., 8-in., and 6-in. c.i. water pipe, about 13,000 ft. in all, also about 35 hydrants; also two half million gallons steam driven pumps. Plans, etc., at office of town clerk and consulting engineer. Tenders received by town clerk until noon July 26th. Advertisement in "Tenders and For Sale Department" of this issue.

Hull, Que.

By-law carried for sewage, $30,000. Owner, Corporation of Hull; engineer, R. W. Farley, Sparks street, Ottawa. Pipe. By-law passed for city to pay its share of $8,000. Tenders called shortly.

Tenders to be called for water mains, $100,000. Owner, City of Hull; engineer, R. W. Farley, Sparks street, Ottawa. Enlargement of water mains, largest size of c.i. pipe, 20-in.; also new mains and general extensions. By-law just passed authorizing. Tenders will be called in about a month.

Milton, Ont.

Tenders to be called for waterworks. Owner, Town of Milton; engineer, J. Hutcheon, Guelph. Three miles of cast iron pipe. Tenders called shortly; received by Geo. A. Hemstreet.

North Bay, Ont.

Tenders called for waterworks extension. Commissioner of Works, [illegible] Colgan, North Bay. Contract A.—Laying of about 46,945 feet of water mains, placing valves, valve boxes, hydrants, etc. B.—Laying of about 500 feet 16-in. steel intake pipe, construction of concrete pump well and necessary connections to two pumps. C.—Supplying of about 15,500 ft. 14-in. pipe; 500 ft. 16-in. steel; 2,500 ft. 10-in.; 27,745 ft. 6-in.; 1,100 ft. 4-in.; and necessary tees, crosses, etc. D.—Supplying of about 32 hyrants, 11 14-in. gate valves and valve boxes, 5 10-in. ditto; 40 6-in. ditto; 3 4-in. ditto. Plans, etc., at office of Commissioner. Tenders close August 5.

New Westminster, B.C.

Machinery required for roadway. City engineer, J. W. B. Blackman, City Hall The council are in the market for the purchase of steam roller, scarifier.

Proceedings of council, cement walks, paving, etc. City Engineer, J. W. B. Blackman. A resolution was passed to construct cement sidewalks on 3rd, 4th, 5th and 6th avenues, etc., also to pave McKenzie, Lorne and Begbie streets.

Tenders to be called for sewer pipe (west end). Owner, City of New Westminster, B.C.; city clerk, W. A. Duncan; engineer, J. W. Blackman, City Hall, New Westminster. Tenders are about to be called for laying twelve miles of sewers in west end, manholes, etc.

Nanaimo, B.C.

By-law carried for sewer extension and power company. Owner, Corporation of Nanaimo; city engineer, A. G. Waters, Nanaimo. Sewerage extensions by-law for $50,000 and B. C. Hydraulic Power Company were both carried.

Ottawa, Ont.

Tenders called for lock gates and valve gates, Trent Canal (Holland River division). Owner, Department of Railways and Canals, Ottawa. Secretary, L. K. Jones, Ottawa. Plans, etc., at office of Chief engineer, Department of Railways & Canals, Ottawa; office of the superintending engineer of Trent Canal, Peterborough. Tenders received until 16 o'clock, August 4th.

Prince Rupert, B.C.

Plans being prepared for sewerage. City Engineer, W. M. Davis, C.E. Two sewerage schemes to drain a portion of the business section. City Engineer will reporta t an early meeting of the council. The work will be done by day labor, but will involve heavy purchases of 6 and 8-inch sewer pipe. A preliminary estimate calls for an expenditure of $250,000 on the work. Details later.

Regina, Sask.

Tenders called for sidewalk construction. Owner, City of Regina; city engineer, L. A. Thornton. Construction of about [illegible] square feet of [illegible] sidewalk. Particulars upon application to city engineer. A marked cheque for $400 to accompany each tender. Tenders received by city commissioners, Regina, until noon, July 28th. Advertisement in "Tenders and For Sale Department" of this issue.

Tenders called for pavement construction. Owner, City of Regina; city engineer, L. A. Thornton. Construction of about 37,500 square yards of pavement and 24,000 lin. ft. of curb and gutter. Particulars upon application to city engineer. A marked cheque for $5,000 to accompany each tender. Tenders addressed to city commissioners, received until noon, July 28th.

Toronto, Ont.

Roadway. Tenders will be received by the Board of Highway Commissioners for twenty miles of macadam highway. Full particulars may be obtained from E. A. James, engineer for the board, 57 Adelaide street east, Toronto. Tenders close July 29, 1911.

West Lorne, Ont.

Works. A by-law will be submitted Aug. 4 to provide an expenditure of $11,000 for installation of waterworks system.

CONTRACTS AWARDED

Goderich, Ont.

Sewer extension. Engineer, M. Roberts. Successful contractor. Conn. Chatham, $26,210; others tendered: Nicholson, Moncton, $28,000; Reid, Brantford, $27,100.

Jonquieres, Que.

Water mains, etc. Owner, Price Bros. General manager, O. Porritt, Quebec; engineer in charge of construction, G. F Hardy, New York. Successful contractor, Contractors Limited, Room 21, 204 St. James street, Montreal. Water mains, sewers, filter, septic tank and pumps; water pipe and intake pipe will be of iron and steel.

Montreal, Que.

Filtration plant, Point St. Charles. Owner, Corporation of Montreal; engineer, Geo. Janin; successful contractor, F. M. McGuigan Construction Company, Continental Life Bldg., Toronto, $673,000. Other tenderers, Quinlan & Robertson, $744,000; Brown & Aylmer, $902,000; P. McGovern, $829,000. Materials required, pumps, pipe, hydrants, valves, meters, concrete.

Sydney, N. S.

Paving, 18,600 ft. (Charlotte street.) Owner, City of Sydney, N. S. City Clerk, Jas. J. Curry, Sydney. Contractor, Central Paving Co. Manager, R. S. Low.

Vancouver, B. C.

Sewer pipe, $52,608. City Engineer, F. L. Fellowes, City Hall, Vancouver; City Clerk, Wm. McQueen, City Hall. Con-

[illegible] Dyes Gilmour & Evans, Ltd. [illegible] pipe ranging from 4 ft. [illegible] in. including a quantity of T's and Y's.

Windsor, Ont.
Street Paving, $71,000. Concrete Paving on [illegible] avenue, Curry avenue, Pelissier street and Ashby Place. Contract to C. W. Cadwell & Co., Windsor. Work to be started within a week or two.

Railroads, Bridges and Wharves

Brooklyn, N.S.
Tenders called for breakwater. Owner, Department of Public Works, Ottawa; secretary, R. C. Desrochers, Ottawa. Construction of breakwater. Plans, etc., at this department, and at the offices of C. E. W. Dodwell, Esq., district engineer, Halifax, N.S.; Thomas J. Locke, district engineer, Shelburne, N.S., and on application to the postmaster at Brooklyn and Liverpool, N.S. Tenders received until 4 p.m., July 26th, by the secretary.

Brampton, Ont.
Steel bridge and concrete abutments, over Credit River. Owners, Townships of Chinguacousy and Esquesing; county engineer, C. R. Wheelock, Orangeville, Ont. Construction of 75-ft. steel span between Townships of Chinuacousy and Esquesing, about 1 mile from Terra Cotta. Contractor for steel structure, Ontario Bridge Co., Manning Chambers, Toronto, $2,230. Contractor for concrete abutments, Wm. Smeaton, Inglewood, Ont., $8 per yard below water line, $6.25 above.

Edson, Alta.
Proposed enlargement of round house. Owner, Grand Trunk Pacific Railway. Steel structural and reinforcing, brick and cement, tar and gravel roofing, crane, turn-table, etc. The present plant will be enlarged to double its capacity. Chas. May Co., contractors for it, may be awarded the new work.

Montreal, Que.
Tenders called for addition to railway station, $200,000 (Windsor to Mountain streets). Owner, Canadian Pacific Railway; architect, W. S. Painter, Windsor Station, Montreal. One storey, concrete, including four new track and sheds to cover them. Tenders received until Aug. 11, 1911.

Midland, Ont.
Tenders called for wireless telegraph station. Owner, Department of Naval Service, Ottawa; deputy minister, G. T. Desbarats, Ottawa. Erection of station. Plans, etc., at office of superintendent of wireless telegraphs, department of naval service, Ottawa; agent department of marine and fisheries, Parry Sound, or to the office of the local postmaster. Tenders received until noon, July 24, by deputy minister. Advertisement in "Tenders and For Sale Department" of this issue.

Oakville, Ont.
Tenders are being received for bridge, $2,200 (over 16-mile creek). Owner, County of Halton; Wm. Panton, city clerk, Milton; engineer, J. Hutcheon, Guelph. Concrete, one span, width 18 ft.

Ottawa, Ont.
Tenders called for station and other buildings. Owner, Commissioners Transcontinental Railway, Ottawa; secrectary, P. E. Ryan, Ottawa. Erection of stations, etc., along Transcontinental Railway on sections 10, Cochrane to Currie, Ont.; 11, from Fraser to Grant; 12, Superior to Dugald; 1,000 ton coaling station at Grant. Plans, etc., at office of Gordon Grant, chief engineer, Ottawa, and at the district engineer's offices at Cochrane and St. Boniface, Man. Tenders received by secretary until noon, August 3rd.

Princeton, B.C.
Tenders called for bridge (across Similkameen river). Owner, Great Northern R. R., Princeton. Engineer, L. M. Hall, Princeton. Foundation piles, length of span about 85 feet. Tenders called July 12, received by W. T. Budd, Princeton; tenders are also called for spur to cement work about two miles.

Prince Rupert, B.C.
Dry dock. Official in charge, J. H. Pillsbury, Prince Rupert. Surveyors are taking soundings to complete plans for floating dry dock at Hays Creek, Prince Rupert. A Dominion subsidy of 3½ per cent. on $2,000,000 for twenty years has already been voted by the Dominion government to the Grand Trunk Pacific for the work. No contracts have yet been called for, but will be ready in very short time. Work is to start within three months, according to contract with city. More details later.

Contemplated, smelter, Goose Bay, 50 miles north. Owner, Granby Smelting Co.; superintendent, H. Macdonald; engineers, Williams & B. Lawrence, New York. The smelter will treat copper ores, capacity 1,000 tons per day. It is understood that an appropriation of $2,000,000 has been voted for this and development work.

Raliegh Tp., Ont.
Tenders called for bridge, Chatham. Location, River Road, West town line. Concrete and steel, concrete and steel foundation. Specifications received until July 22 by Thos. R. Clarke, N. Buxton.

Township of Amaranth, Ont.
New tenders called for bridge. Owner, County of Dufferin; engineer, F. Barber, 57 Adelaide street east, Toronto. Construction of concrete abutments for steel bridges; Miller's Creek Bridges, Lot 26, Con. 10; McConachie's Bridge, Lot 6, Con. 9. Plans, etc., at office of the engineer. Tenders received until noon, July 17, by F. Barber.

Toronto, Ont.
Tenders called for groynes (Kew Beach). Owner, City of Toronto, Ont. president, board of control, F. S. Spence. Construction and placing of groynes in Lake Ontario at the foot of the following: Woodbine, Waverley, Leuty, McLean and Beech avenues. Specifications obtained on application to Department of Railways and Bridges, City Hall. Tenders received by chairman board of control, until noon, July 24th. Advertisement in "Tenders and For Sale Department" of this issue.

Tenders called for cleaning and painting bridges. Owner, City of Toronto; president board of control, F. S. Spence. Supply of paint, cleaning and painting of three bridges. Specifications on application to Department of Railways & Bridges, City Engineer's office. Tenders received by chairman, board of control, until noon, July 31st. Advertisement in "Tenders and For Sale Department" of this issue.

Toronto, Ont.
Tenders called for construction of cribwork (Princess street). Owner, City of Toronto; president board of control, F. S. Spence. Construction of cribs at city yard. Specifications on application to Department of Railways and Bridges, City Engineer's office, Toronto. Tenderers to submit the names of two sureties (approved of by the city treasurer) not members of city council or officers of corporation. Tenders received by chairman board of control until noon, July 24.

Township of Chatham, Ont.
Tenders called for bridge (over Otter Creek on town line). Owner, Township of Chatham and Sombra; engineers, Bell & McCubbin, St. Thomas, Ont. Construction of reinforced concrete, beam bridge. Plans, etc., at residence of Neil McGugan, Wilkesport, at William Abraham's, Chatham Township, or at office of engineers. Tenders received until noon, July 17th, by engineers. Advertisement in "Tenders and For Sale Department" of this issue.

CONTRACTS AWARDED

Rivers, Man.
Bridge, $6,000. Owner, Municipality of Daly, Man. Successful contractor, Algoma Steel Co., Sault Ste. Marie, Ont. Steel on concrete abutments, one span, 80 ft. long, 26 ft. wide, concrete abutments.

Toronto, Ont.
Street railway, $55,976. Owner, City of Toronto. Contractors, F. H. Hopkins Co., Montreal, Que., 44-yd. dump cars, $8,600; 4 flat cars at $875; 200-ton steel rails, 30 lbs. per yd., $6,500; 75 kegs spikes, 20 kegs bolts, $1800; pair fish plates, $806; 1 marion shove $8,665; Whyte Railway Signal Co., Manning Arcade, Toronto, 24 switch leads $740. Thew Automatic Shovel Co., Loiraine, Ohio, 1 Thew shovel $6,780. H. K. Porter Co., Pittsburg, Pa., 6 saddle tank locomotives, $20,385.

Winnipeg, Man.
Subways, Sherbrooke street and Elgin avenue. Owner, Great Northern Railway; W. Eddy, engineer of construction. Contractors, John Gunn Co., subways on Sherbrooke and Ross ave., Elgin ave., Wallace and Akin, corner Harvard and Wilton, Winnipeg. W. J. H. Holmes will have charge of the bridging to be done between Brant & Sherbrooke streets. Work will commence immediately.

Public Buildings, Churches, Schools, etc.

Amherst, N.S.
Heating and ventilation required for school, West Highland. Owner, Corporation of Amherst; clerk, W. F. Donkin; architect, Leslie R. Fairn, Aylesford, N.S. Installation of heating and ventilating system. Plans, etc., at town office and at office of architect. Tenders received until 5 p.m., July 21st. by town clerk.

Barnett, B. C.
Police Sub-Station. Plans are being prepared by Architect Hugh A. Hodg-

son, Carter-Cotton Building, for a 2-storey police sub-station, 60x80, concrete construction.

Chilliwack, B.C.

Tenders called for public building. Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers, Ottawa. Erection of public building. Plans, etc., at office of W. Henderson, resident architect, Victoria, B.C., at the local post office and at the department. Tenders received by secretary until 4 p.m., July 24.

Fort William, Ont.

Addition to School. Tenders have been called by R. E. Mason until 5 o'clock July 7 for electric wiring, plumbing, pointing and glazing for addition to Central School. Combined tenders will represent $6,000 to $8,000.

Halifax, N.S.

Tenders called for school, Tower road. Owner, Board of School Commissioners; secretary, R. J. Wilson; architect, W. T. Busch, 60 Bedford Row, Halifax, N.S. Erection, including heating, ventilating and wiring. Plans, etc., at office of architect. Tenders received by secretary until 1 p.m., July 21st.

Humboldt, Sask.

Tenders called for public building. Owner, Department of Public Works, Ottawa; secretary, R. C. Desrochers, Ottawa. Construction of public building. Plans, etc., at office of J. E. Cyr, Superintendent of Public Buildings, Post Office Building, Winnipeg, Man., at local post office and at department. Tenders called until 4 p.m., July 31.

Hull, Que.

By-law carried for erection of two fire halls, $50,000. Owner, City of Hull, City Clerk, F. D. Boult; architect, not chosen yet. Brick, metal roof. Tenders may be called soon.

Montreal, Que.

Tenders called for church, $9,000, Ainsley road. Owner, Episcopal Congregation, Montreal West; architect, Peden & MacLaren, 20 St. Alexis, Montreal. One storey, 55 x 70, brick,

Hamilton, Ont.

Tenders to be called for church, $12,000, Barton street east. Owner, Roman Catholic Diocese of Hamilton; Mgr. Mahoney, Dean; architects, S. A. Wardell, 110 Hunter street west. One storey, 130 x 57, stone foundation, brick, stone, cement, hot air heating, electric lighting, shingle roofing, cut stone. Plans, etc., with architect. Tenders will be called shortly.

Kingston, Ont.

Tenders called for post office. Owner, Department of Public Works, Ottawa. Additions and alterations to post office. Plans, etc., at department and on application to Wm. Newlands & Sons, architects, Kingston. Tenders received by secretary until 4 p.m., July 31

Melfort, Sask.

School. W. W. Lachance, Saskatoon, hos been chosen as architect for an 8-room school to be erected here.

Milton, Ont.

Proposed system of heating for county building. Owner, County of Halton; county clerk, W. Panton, Milton. Steam heating. Plans and estimate not prepared yet.

Montreal, Que.

Work in progress for school, $22,000, Laprairie street. Owner, Catholic School Commissioners; architect, W. E. Doran, 180 St. James street, Montreal; general contractor, J. B. Gratton, Ltd., 82 Mercier street, Montreal. Three storeys, brick and stone.

North Grimsby, Ont.

School. A by-law will be submitted to raise $4,000 for the erection of a school in Union School Section No. [illegible]. of this township.

Newdale, Man.

School. Tenders have been called by Municipality of Newdale for the erection of a $12,000 school, 1-storey, brick and stone, 64x36, Muller hot air heating, pitch roof. W. A. Elliott, Brandon, architect.

Ottawa, Ont.

Tenders called for experimental farm building. Owner, Department of Public Works, Ottawa; secretary, R. C. Desrochers, Ottawa. Construction of Tobacco Curing Barn. Plans, etc., at department. Tenders received by secretary until 4 p.m., July 24.

Sherbrooke, Que.

Equipment required for fire hall, $3,100. Owner, City of Sherbrooke, Que. Architect, L. N. Audet, Sherbrooke; general contractor, Chas. Veneau, Sherbrooke, Que. Hose and equipment will be required. Nothing definite can be decided until after council meeting.

Snowflake, Man.

Tenders called for school. Owner, Snowflake Consolidated S. D. No. 1111. Sec-treas., Jas. Fyfe, Snowflake. Work specified, cement, masonry, plastering, carpentry and painting. Plans, etc., at the Builders' Exchange, Winnipeg, or at office of E. Shilson, Snowflake. Tenders received until 5 p.m., July 15th.

Swift Current, Sask.

New plans prepared for hospital, $25,000. Owner, Corporation of Swift Current, Sask.; architects, Sharron & Darrach, Swift Current and Regina, Sask. Two storeys, 74 x 73, brick, concrete foundation, cement work, cut stone, roofing paper, plate glass, electric lighting, cornice, paradox canvas roofing, interior finish, fir. Tenders exceeded amount of by-law. Architects will send out revised plans to firms who tendered, about July 14. Tenders probably received a week later.

Thamesville, Ont.

Tenders called for town hall. Owner, Corporation of Thamesville; architect, Watt & Blackwell, London, Ont. Two stys. and basement, brick and frame, concrete fndtn., cut stone, concrete blocks, artificial stone, steel beams, iron columns, steam heating, electric light-terior finish pine. Plans, etc., with architect. Tenders received until July 22. and woodwork. concrete foundation, hot air heating, electric lighting, Canada slate roofing, interior finish oak, cement, cut stone, marble, tile, mantels, ornamental iron, sheet metal, cornice, electrical work, telephone system, iron columns, ornamental columns and caps, art glass, etc. Tenders closed July 18.

Toronto, Ont.

Work in progress for hockey rink, $8,000, Ravina road. Owner, Jesse Smith, 307 Pacific avenue, Toronto; architect, Ellis & Connery, Manning Chambers. One storey, 130 x 60, wood, concrete foundation, electric lighting, open plumbing, asbestos and ready roofing. Owner will build by day labor.

Alterations of plans for church, $10,000. Owner, Davenport Methodist Church, Davenport road; architect, D. E. Smith, 77 Victoria street, Toronto. Brick, 72 x 60, brick foundation, steam heating, electric light, felt and gravel roof, maple flooring. It has been decided not to go ahead with this work until next spring.

Verdun, Que.

Plans being prepared for fire station, Woodlands. Owner, Town of Verdun. Official in charge, Town Engineer, Verdun. Work being done by corporation.

Vancouver, B.C.

Church. Plans are being prepared by Sharp & Thompson, 536 Hastings street W., for a 100x60 church for the congregation of the First Congregational Church, brick and stone construction, hot water heating, slate roof, tiles, electric lights, leaded glass, etc. Separate tenders will be called on completion of plans.

Tenders to be called for general hospital, superstructure, 10th to 12th sts. Owner, General Hospital Bldg.; Geo. Hadden, secretary, Vancouver; architect, Grant & Henderson, Williams Bdg., Vancouver. Three storeys and basement, stone and concrete wing. Tenders will be called shortly. Heating and plumbing let separately.

Watrous, Sask.

Tenders called for addition to school. Owner, Town of Watrous; secretary, N. Grest; architect, W. W. LaChance, Saskatoon. Erection of a 2-room brick bldg. Plans at office of architect of Waldon Co., 92 Princess street, Winnipeg, and the secretary. Tenders received by secretary until July 17.

Windsor, Ont.

Plans being prepared for addition to hospital, $50,000. Owners, Hotel Dieu Hospital Association, composed of Nuns of the Catholic Church in Windsor; architect, John R. Boyde, Ouelette avenue, Windsor. Plans being prepared for a 3-storey addition to the present Hotel Dieu.

Westmount, Que.

Tenders called for fire station, Upper Level. Owner, City of Westmount, Que. City Surveyor, Architect Currie, Westmount. Erection of fire station, No. 2. Drawings, etc., at office of city surveyor after July 17th. Copies, etc., obtained on payment of $15, which will be refunded, etc. Tenders received after July 17th until July 27th. Advertisement in "Tenders and For Sale Department" of the [illegible]

Winnipeg, Man.

Tenders called for supply of pedestals. Owner, City of Winnipeg. Secretary, Board of Control, M. Peterson. Supply and delivery f.o.b. Winnepeg, c.i. pedestals for supporting fire and police telegraph boxes. Plans, etc., obtained at office of the city electrician. Tenders addressed to the chairman, board of control, received until 11 a.m., July 20.

Yorkton, Sask.
Theatre. W. W. Lachance, Saskatoon [illegible] chosen as architect for a the[illegible] to be erected here.

CONTRACTS AWARDED

Lethbridge, Alta.
Theatre, [illegible]. Owner, Alberta Loan & Investment Co., Lethbridge. General contractor, Wm. Watts, Lethbridge. Brick and steel. Contract let July 8th. Building to be completed by Sept. 1st.

Moose Jaw, Sask.
School, [illegible]. Owner, Public School Board. Architect, R. G. Bunyard, Moose Jaw; 2-storey and basement, 136 x 82, fireproof. General contractor, Thos. Grayson, Moose Jaw. Awarded July 5th.

New Westminster, B. C.
Masonic Temple. The contract for the erection of the Masonic Temple Building has been awarded to Snider & Brethour, Exchange Building, Vancouver. The building will be 3 storeys, 62 x92, cost about $35,000. The general contractors will receive tenders on plastering, painting, wiring, stone cutting and excavation. Work will be started immediately.

Renfrew, Ont.
Gymnasium. The contracts for a $4,695 gymnasium, solid brick, 2 storeys, 35x80, were awarded as follows: General contractor, W. A. Moore; masonry, W. Vanderson; carpentry, John Roberts plastering, Robert Ferguson; heating, H. D. Moss; plumbing, John Conley, all of Renfrew. Building to be completed Sept. 1st, 1911.

Saskatoon, Sask.
Schools. The contracts have been awarded to Shannon Bros. & Cassidy, for the construction of two 14-room schools at a total cost of$78,950 for each school, exclusive of plumbing, heating and ventilation, for which separate tenders will be called later. David Webster, architect for board.

Toronto, Ont.
Clubhouse, $70,000. Owner, Ontario Club, Toronto. Architect, Sproat & Rolph, 90 Yonge street, Toronto. Contractor for masonry, Mr. Hughes, 216 Simcoe street, Toronto; iron work, Dominion Bridge Co., Toronto. Cement contract not let yet.

Residences

Dundas, Ont.
Plans being prepared for residence, $5,000. Owner, Mr. Cliff, Dundas, Ont. Architect, Stewart McPhie, Bank of Hamilton Chambers, Hamilton. 2½ storeys, 45 x 50, brick and stone, stone foundation, hot water heating, electric lighting, shingle roof, cement work, sheet metal work, electric bells.

Hamilton, Ont.
Plans prepared for four residences, $5,200, Trolley street. Owner, B. Prott, Trolley street, Hamilton (private plans). Two storeys, 90 x 100, cement blocks, cement foundation, hot air heating, gas, lighting, shingle roofing. Owner will buy blocks and build himhelf.

Montreal, Que.
Dwelling. Joron & Renaud, 129 St. Lawrence street, will erect a 3-storey dwelling house, 18 flats, wood and brick, stone foundation.

Tenders closed for residence, $4,000. Owner, E. T. Stevenson, Herald avenue, Montreal W. Architect, Peden & MacLaren, 20 Alexis, Montreal. One storey, 30 x 28, brick, concrete foundation, electric lighting, galvanized iron roof, interior finish white ash, cement, marble, brick, ornamental iron, tile mantels, telephone system, plate glass, etc.

Work in progress for erection of a residence, $2,800, on Boyer street. Owner, O. Lagouiere, 2537 St. Hubert street, Montreal. (Private plans). 2-storey, 25x32, brick, stone foundation, brick, tile, mantels, ornamental iron, telephone system, plate glass, etc.

Work in progress for new residence, $3,500. (406 Clarke street). Owner, L. Sauve, 109 Lasalle street, Montreal. (Private plans). 3-storey, brick, stone foundation, hot water heating, artificial stone, electric bells, plate glass, etc.

Work in progress for residence, $2,000. (374 St. Claire). Owner, J. Charbornneau, 2147 St. Lambert, Que. (Private plans). 2-storey brick, stone foundation, hot water heating, electric lighting, shingle roof, brick tile mantels.

Tenders called for residence, $20,000. (Mount Rose avenue). Owner, Mr. T. Findlay, 10 Phillips Spuare, Montreal. 3-storeys 80x90, brick, concrete foundation, electiic lighting, slate roof, cement, cut stone, artificial stone, structural and ornamental iron, sheet metal, pipe covering, electrical work, telephone system, electric bells, steel beams, ornamental columns, plate and art glass. Tenders will be called next week, close 10 days after.

Ottawa, Ont.
Tenders called for residence. Owner, W. H. A. Fraser, Nepean street; architect, W. E. Noffke, 26 Central Chambers, Ottawa. Required, hot water heating (2 boilers), plumbing, electric work, painting. Tenders received until July 17th.

St. Boniface, Man.
Tenders to be called for residence, $3,500. Owner, J. P. Tremblay, Builders' Exchange, Winnipeg. Architect, H. B. Rugh, Union Bank Building, Winnipeg. Frame and cement plaster, concrete foundation, hot air heating, electric lighting.

Shawinigan Falls, Que.
Tenders called for 6 cottages, $16,000. Owner, Shawinigan Real Estate Co., Shawinigan Falls, Que. Architect, Peden & McLaren, 20 St. Alexis, Montreal. 1-storey, brick, concrete foundation, electric lighting, shingle roof, mantels, electrical work, telephone system, shingle roof, plate glass, etc. Tenders received after July 30.

Toronto, Ont.
Work in progress for residence, $3,000. Owner, Mr. Rappaport. Architect, Ellis & Connery, Manning Chambers, Toronto. 2½ storeys, 16x36, brick and stone, stone foundation, interior finish, hardwood and pine. Owner will build by day labor.

Work in progress for residence, $4,000. Owner, J. C. Eaton, 190 Yonge street. Architects, Wickson & Gregg, 59 Yonge street, Toronto. 2-storey, 39x33, brick, brick foundation, interior finish hardwood, cut stone, brick, tile, mantels, electrical work, etc.

Tenders called for residence, $5,000. (Bloor street west). Owner, Dr. A. L. Murphy, 927 Bloor W., Toronto. (Private plans). 2½ storeys, 28 ft. 8 in. x 40 ft. 9 in., brick and stone, stone foundation, hot water heating, electric lightinf, cut stone, brick, tile, mantels, structural iron, electrical work, steel beams, plate, art and prismatic glass, etc. Date of closing tenders not decided.

Residence. W. W. Hiltz, Broadview avenue, will erect a $3,000 residence at Carlaw and Strathcona, 2½ storeys, 30x 22, brick and roughcast, hot air heating, slate or shingle roofing. Will be erected by day labor.

Work in progress for residence, $5,000, west side Indian Grove. Owner, W. E. Stewart, Toronto; architect, J. A. Harvey, Manning Chambers, Toronto. 2½ storeys, 38 x 24, brick and stone, stone foundation, hot water heating, electric lighting, open plumbing, shingle felt and gravel roofing, interior finish hardwood.

Work in progress for residence, Kinswood road. Owner, Elmer W. Harper, Cottingham street, Toronto; architect, E. R. Babington, 28 Toronto street, Toronto. Two storeys, 34 x 22, brick, brick foundation, hot water heating, electric lighting, open plumbing, shingle roofing, interior finish hardwood and pine, brick, tile, mantels, sheet metal work, electrical work. Owner will build by day labor.

Tenders clled for three pairs of dwellings, $5,600, 1277-87 Gerrard street east. Owner, W. J. Grant, 29 Callender street, Toronto; architect, Thos. Harris, 43 Howard Park avenue, Toronto. Two storeys, 33 x 35, brick and stone, stone foundation, hot air heating, open plumbing, shingle, felt and gravel roofing, cut stone, brick, mantels, cornice, electrical work,plate glass. Owner is open for tenders on all work but masonry and carpentry. Date of closing of tenders not decided.

Tenders called for 1 pr. residences, $3,200. (Uxbridge Ave). Owner, E. Bracewell, 369 Perth avenue, Toronto. (Private plans). 2-storey, 38x29, brick and stone, stone foundation, cut stone, sheet metal work, shingle roof, electric bells, shingle stain, plate glass. Tenders called until July 19th.

Work in progress for residence, $5,000. (Constance and Roncesvalles). Owner, M. E. Andrews, Howard Park and Roncesvalles, Toronto. Architect, J. A. Harvey, Manning Chambers, Toronto. 2½ storeys, 48x24, brick and stone, stone foundation, hot water heating, electric lighting, interior finish hardwood, etc.

Tenders to be called for one pair of residences, $4,000, Grace street. Owner, Mr. Baumhart, 215 Gladstone avenue, Toronto; architect, J. Hunt Stanford, 34 Yonge Street Arcade, Toronto. 2½ storeys, 36 x 41, brick, stone foundation, cement work, sheet metal work, cut stone, hot water heating, combination lighting, shingle stain, pine and hardwood interior finish. Tenders received by owner after July 13th.

Tenders called for 2 pr. dwellings, $10,000. Owner, Wilkinson & Co., Walmer road, Toronto. 2½ storeys, 45x34, brick, stone foundation, combination lighting, shingle, felt and gravel roofing, interior finish hardwood, cut stone, brick tile, mantels lath, structural iron, elec. work, steel beams, plat anr art glass. Tenders close July 26th.

Vancouver, B. C.

Apartment house. Plans have been completed for a 3-storey apartment house to be erected at the corner of Salisbury Drive and Parker street for the Caledonian Investment Co., brick 122x61, tar and gravel roofing, hot water heating, three marble entrances, etc. Tenders were called until July 11th.

Westmount, Que.

Tenders called for residence, $4,000. Owner, G. N. Scott, Montreal. Architect, Peden & MacLaren, 20 Alexis, Montreal; galvanized iron roofing, interior finish white ash, cement, 1-storey, 30x28, brick, concrete foundation, electric lighting, steel beams, plate glass, etc. Tenders received after July 20, close July 30.

Winnipeg, Man.

Plans in progress for apartment house (Langside, near Armstrong's Point). Owner's name not to be made known. Architect, Paul M. Clemens, Brown Block, Winnipeg. Three storey and basement, brick and stone.

Winnipeg, Man.

P. M. Clemens, architect, has prepared plans for erection of a new apartment building on Langside between Cornish and Westminster to cost $55,000.

CONTRACTS AWARDED

Halifax, N.S.

Residence, $4,000, Seymour street. Owner, Jas. G. Jamieson, 581 Robin st., Halifax. General contractor, David Grey, 266 South street, Halifax. Foundation concrete, fireproof.

Residence, $2,500, Jubilee road. Owner, Geo. Morton, 154 Almon street, Halifax; general contractor, Geo. Morton, 172 Agricea street, Halifax.

Montreal, Que.

Residence, $17,000. Owner, A. A. Ayer, 362 Kensington avenue, Westmount, Que. Architect, Saxe & Archibald, Beaver Hall Hill, Montreal. Masonry, stone and brick, Reid, MacGregor & Reid, 228 St. Catherine W.; carpentry, H. Mercure, 1124 Rochel E.; roofing, Westmount Plumbing & Heating Co., Ltd.; heating and plumbing, J. A. Gordon, 301 St. Antoine street, all of Montreal. 3-storey, brick and stone.

Conservatory. The contract has been awarded to Reid, MocGregor & Reid, 668 St. Catherine street, Montreal, for the erection of a $21,200 conservatory at 240 Drummond street, by R. B. Angus. E. & W. S. Maxwell, architects.

St. Agathe, Que.

Two bungalows, $12,000. Owner, Mr. Herbert Molson, Drummond street, Montreal; architects, Robert Findlay, 10 Philips Place, Montreal; general contractor, John Thurm, St. Agathe des Monts. One storey, 40 x 35, brick and wood. Building to be completed December, 1911.

Sherbrooke, Que.

Tenement, $4,000, London street. Owner, Mrs. T. Davidson, Sherbrooke (private plans); general contractor, J Gilbert Brown, Sherbrooke. Two storeys, wood, 40 x 48. Building to be completed October 1st.

Winnipeg, Man.

Residence, $25,000. (Wellington Crescent). Owner, Peter Lyall, Jr. Architect, H. B. Rugh, Union Bank Building. General contractor, Peter Lyall & Sons, Winnipeg. Brick and stone, stone foundation, steam heating, electric lighting. Materials will be required.

Business Buildings and Industrial Plants

Alliston, Ont.

Factory. A $10,000 factory building is contemplated. Wm. McBride and F. M. Brown, interested parties.

Coalmont, B.C.

Work in progress for hotel, $20,000. Owner, L. Marcott, Coalmont (private plans). Three storeys, frame, rock foundation, felt roofing, pine interior finish. Tenders closed July 12th.

Calumet, Que.

Destroyed by fire, saw mills. Owner, Riordan Paper Co., 1 Beaver Hall Sq., Montreal. Managing director, C. Riordan; W. K. Trower, sec.-treas. Loss reported at $200,000.

Edmonton, Alta.

Manufacturing plant, 150 miles west on G. T. P., Portland Cement Co., incorporated, with a capital of $1,500,000. Engineer, Mr. Clossosskil, Edmonton. Parties interested, Lundy & McLeod, realty brokers, Edmonton. Stock being solicited; plans for buildings and machinery not completed yet. Specifications for the following have been prepared: Boilers, electric lights and power plant consisting of one 1,000 k.w. engine or turbine driven set; one 500 k.w. engine or turbine driven set; two 40 kw. driven exciters. The following will no doubt be required: Motors, steel for buildings, power crane, roasters, dry kilns, stokers, pumps, elevators, steam shovel, etc.

Hamilton, Ont.

Plans being prepared for factory, $40,000, James street north. Owner, Diamond Flint Glass Co., James street north; architects, Stewart & Witton, 7 Hughson street south, Hamilton. One storey and basement, 300 x 150, steel frame, stone foundation, cement reinforced concrete, steel beams, tile roofing, structural iron. Two glass furnaces required.

Site purchased for factory, Aberdeen avenue. Owner, Parsons & Parsons, Cleveland and Main west, Hamilton. Company will build factory early next year. No plans prepared yet. Firm manufacturing collars and shirts now occupying temporary premises.

Montreal, Que.

Work in progress for flour mills, $75,000. Owner, Dominion Flour Mills Co., Ltd., Brantford, Ont. Engineer, J. A. Jamieson, 313 Board of Trade Bldg., Montreal; general contractor, D. G. Loomis & Sons, Cote St. Paul, Montreal. Six storeys, 199 x 56, wood and brick, heating, plumbing and iron work contracts not let yet. The bulk of the machinery is still to be supplied.

Work in progress for office and manufacturing building on St. Catherine street. Owner, Kellert & Sons, St. Catherine street, Montreal; architect, Hutchison, Wood & Miller, Royal Insurance Bldg., Montreal; general contractor, C. E. Deakin, 11 St. Sacrament street, Montreal. Heating, plumbing, sheet metal, iron work not let yet.

Tenders called for alterations to building, 533 St. Catherine street east. Owner, Senator J. M. Wilson Estate; architect, Saxe & Archibald, Beaver Hall Hill, Montreal.

Tenders to be called for offices, $34,000, Longue Pointe. Owner, Montreal Locomotive Works, Ottawa Bank Bldg. Two storeys, steel and pressed brick, concrete foundation, cut stone, reinforced concrete, steel beams, fire escapes, structural iron, slate roof, telephone system, vaults, plate glass. Tenders received after July 18, until July 30th.

Preston, Ont.

Factory, $8,000. Owner, Preston Woodworking Machinery Co., Ltd., Preston, has been formed. President, W. S. Hudson, Preston; general manager, M. Mullen; manager of works, H. Murray; sec.-treas., Allen Kerr, and plan erection of machine shop, 100 ft. by 100 ft., moulding shop, 40 x 60 ft.; concrete construction, steam heating, electric lighting, patent roofing. Mr. Mullen is superintending construction.

Quebec, Que.

Site purchased for bank, St. Peter st. Owner, International Bank; president, R. Forget, 73 Notre Dame west, Montreal. Site purchased for $36,000.

Contemplated, factory. Owner, Dominion Corset Co., 216 Notre Dame W. Proprietor, G. E. Amyot. A new corset factory will be erected to replace that burned down last May.

Shawnigan Falls, Que.

Tenders to be called for extension to hotel, Cascade Inn. Owner, Shawnigan Real Estate Co., Shawnigan Falls; architect, Peden & McLaren, 20 St. Alexis, Montreal. One storey, brick, electrical work, marble, brick, plate glass. Tenders received after July 20th, close July 30.

Saskatoon, Sask.

Office Building. The Public School Board agreed to erect a modern office building instead of remodelling the school on 3rd ovenue.

Toronto, Ont.

Work in progress for alterations to store, $8,000. Owner, Liggetts, Limited, 106 Yonge street, Toronto; architect, Ellis & Connery, Manning Chambers, Toronto. One storey addition, brick and stone, felt and gravel roofing, skylights, electrical work, steel beams, prismatic glass.

Contemplated, store and offices, $15,000, south side King street east, No. 95-97. Architect, R. A. Abraham, 71 Winchester street, Toronto. Three storeys, 42 x 102, brick, brick foundation, hot water heating, electric lighting, open plumbing, felt and gravel roofing, interior finish pine, cement, cut stone, brick, terra cotta, vaults,co rnice, skylights, wire glass needed. Owner's name withheld by request.

Work in progress for warehouse, $12,000, Ernest avenue. Owner, Consumer's Box & Lumber Co., Ernest avenue, To-

Tenders and For Sale Department

CITY OF REGINA

Sidewalk Construction

Sealed tenders addressed to the City Commissioners, Regina, and endorsed on enevelope "Tender for Sidewalk Construction," will be received up to 12 o'clock noon, **Friday, July 28th, 1911,** for the construction of approximately **175,000** square feet of concrete sidewalks.

Particulars may be had upon application to the City Engineer.

A marked cheque for **$1,400** must accompany each tender.

The cheque of the unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

(Signed) L. A. THORNTON,
City Engineer.

28-29

CITY OF REGINA

Pavement Construction

Sealed tenders addressed to the City Commissioners, Regina, and endorsed on envelope "Tender for Pavement Construction," will be received up to 12 o'clock noon, **Friday, July 28th, 1911,** for the construction of approximately **37,500** square yards of pavement and **24,000** lineal feet of curb and gutter.

Particulars may be had upon application to the City Engineer.

A marked cheque for **$5,000** must accompany each tender.

The cheque of the unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

(Signed) L. A. THORNTON,
City Engineer.

28-29

CITY OF TORONTO

TENDERS

for the Construction and Placing of

GROYNES

in Lake Ontario at Kew Beach, Toronto

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on **Monday, July 24th, 1911,** for the construction and placing of Groynes in Lake Ontario at the foot of the following streets:—

Woodbine avenue,
Waverley avenue,
Leuty avenue,
McLean avenue (Howard)
Beech avenue.

Envelopes containing tender must be plainly marked on the outside as to contents.

Specifications and form of tender may be obtained on application to the Department of Railways & Bridges, City Engineer's office, Toronto.

The tenderers shall submit with their tenders, the names of two sureties (approved of by the City Treasurer, not members of the City Council or officers of the Corporation of the City of Toronto, or in lieu of said sureties the bond of a guarantee company approved of as aforesaid.

The lowest or any tender not necessarily

F. S. SPENCE,
President of the Board of Control.

City Hall, Toronto, July 8, 1911. 28-29

Steam Shovels

We own and have for sale near Buffalo, N.Y., two Vulcan 75-ton 2½-yard steam shovels; late model, with new extra large boilers and in excellent condition; also one 70-ton. These will stand most rigid inspection and we are offering them at unusually low prices. Confer with us.

WILLIS SHAW MACHINERY CO.,
39 So. La Salle Street,
Chicago, Ill.

Trench Machines

Parsons—Cuts trench 27 in. to 60 in., to 20 ft. deep, fine order.

Parsons—With Mattes Back Filler, cuts trench 28 in. to 78 in. to 20 ft. deep. Ovtrhauled and first class. Write us if you have anything to sell, or if in want of anything.

THE MALES CO.
No. 82 Perin Building, Cincinnati, O.

Department of Railways and Canals

TRENT CANAL

Lockgates and Valve Gates

Holland River Division

Sealed tenders addressed to the undersigned and endorsed "Tender for Lock-gates and Valve Gates, Holland River Division," will be received at this office until sixteen o'clock, on **Friday, August 4th, 1911.**

Plans, specifications and form of contract to be entered into can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Superintending Engineer of the Trent Canal, Peterborough, Ont., at which places form of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $2,000, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, July 7th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be pail for it. 29-30

TOWN OF NORTH BAY

Water Works Extension

Sealed tenders endorsed "Tender A" and "Tender B," "Tender C" and "Tender D," will be received by the undersigned up to **Saturday, August 5, 1911.**

Contract A. The laying of approximately 46,945 lineal feet of water mains, placing valves, valve boxes, hydrants, etc.

Contract B. The laying of approximately 500 lineal feet of 16 in. steel intake pipe, the construction of concrete pump well on lake shore and the necessary connections to two pumps.

Contract C. The supplying of approximately 15,500 feet lineal 14-in. pipe; 500 ft. lineal 16-in. steel pipe; 2,550 feet lineal 10-in. pipe; 27,745 feet lineal 6-in. pipe; 1,100 feet lineal 4-in. pipe; and the necessary tees, crosses, curves, etc.

Contract D. The supplying of approximately 32 hydrants, 11 14-in. gate valves and valve boxes, 5 10-in. gate valves and valve boves, 40 6-in. gate valves and valve boxes, 3 4-in. gate valves and valve boxes.

Separate tenders are desired for the supply of and laying of steel pipe, (2) cast iron pipe, and (3) wood stave pipe, in contracts "A" and "C".

Plans and specifications may be seen at the office of the Commissioner of Works, North Bay.

The lowest or any tender not necessarily accepted.

T. N. COLGAN,
Commissioner of Works.

North Bay, July 11, 1911. 29-31

Department of the Naval Service

Sealed tenders, addressed to the undersigned and endorsed "Tender for the Erection of Wireless Telegraph Station," at Midland, Ontario, will be received at this office until noon, **on July twenty-fourth, 1911.**

Plans, specifications and form of contract to be entered into can be seen on and after July tenth instant, at the office of the Superintendent of Wireless Telegraphs, Department of the Naval Service, Ottawa, the Office of the Agent of the Department of Marine and Fisheries, Parry Sound, Ontario, or the Office of the Postmaster at Midland, Ontario.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation, and place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, payable to the order of the Honorable the Minister of the Naval Service, equal to ten per cent. (10 p.c.) of the amount of the tender, which will be forfeited if the person tendering decline to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,
G. J. DESBARATS,
Deputy Minister.

Department of the Naval Service,
Ottawa, July 7th, 1911.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department. 29-29

Corporation of the City of Nanaimo
B.C.

Street Paving

Tenders are invited for approximately 14,450 superficial yards of Asphaltic Macadam or other approved paving.

A plan of streets and further particulars may be obtained of the undersigned.

Sealed tenders endorsed "Tender for Paving" to be sent to the undersigned not later than **July 21, 1911.**

The lowest or any tender not necessarily acceptes.

ALLAN WATERS,
City Engineer.
June 26, 1911. 27-29

CITY OF TORONTO

Tenders
For the
Construction of Cribs
At the City Yard, Princess Street
Toronto

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on **Monday, July 24th, 1911**, for the construction of cribs at the City Yard, Princess street.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained on application to the Department of Railways and Bridges, City Engineer's office, Toronto.

The tenderers shall submit with their tenders the names of two sureties (approved of by the City Treasurer, not members of the City Council or officers of the Corporation of the City of Toronto) or in lieu of said sureties the bond of a guarantee company approved of as aforesaid.

The lowest or any tender not necessarily accepted.

F. S. SPENCE,
President of the Board of Control.
City Hall, Toronto,
July 7th, 1911. 28-29

CITY OF TORONTO

Tenders for the
Supply of Paint
and for the
Cleaning and Painting of Bridges

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on **Monday, July 31st, 1911**, for the supply of Paint, and for the Cleaning and Painting of Three Bridges in the City of Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained on application to the Department of Railways & Bridges, City Engineer's office, Toronto.

The tenderers shall submit with their tenders, the names of two sureties (approved of by the City Treasurer, not members of the City Council or officers of the Corporation of the City of Toronto, or in lieu of said sureties the bond of a guarantee company approved of as aforesaid.

The lowest or any tender not necessarily accepted.

F. S. SPENCE,
President of the Board of Control.
Toronto, July 10, 1911. 28-29

FOR SALE

Complete Electric Generating Set, consisting of Leonard Peerless steam engine direct connected to 150 k.w. Canadian General Electric generator, 2,300 volts, 60 cycles; also condenser, switchboard, steam and exhaust piping, spare parts for engine and generator, and everything constituting the complete set as at present installed in the Thomas street lighting station of the Town of Brockville. This machine is in first-class order, having only been used on peak loads. It is now being replaced by a larger Belliss & Morcom engine with Swedish G. E. generator. Full particulars and price can be obtained from Laurie & Lamb, Consulting Engineers, Board of Trade Building, Montreal. 28-35

Department of Railways & Canals

Intercolonial Railways—Improvements at Halifax

EXTENSION OF TIME

The time for rceeiving tenders for Pier and Sheds has been extended from Thursday, the 20th day of July, 1911, to **Monday, the 31st day of July, 1911**, at 12 o'clock noon.

By order,
L. K. JONES,
Department of Railways and Canals,
Ottawa, June 5th, 19..

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 29-30

Toronto Main Drainage

Tenders will be received on **Friday, August 4th, 1911**, for the construction of Low Level Interceptor, Don Syphon (crossing under the River Don), and for the manufacture and delivery of the following:—

280 linear feet 30-inch Cast Iron Pipe.

5,984 linear feet 42-inch Reinforced Concrete Pipe.

1,985 linear feet 30-inch Reinforced Concrete Pipe.

2,315 linear feet 36-inch Reinforced Concrete Pipe.

Plans, specifications, forms of tender and conditions relating to tendering as prescribed in City By-laws may be obtained from the Main Drainage Works office of City Engineer, Toronto.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman, Board of Control.
City Hall, Toronto,
July 14th, 1911 29-30

Tender
for
Macadam Highway

Tenders will be received up till **July 29th, 1911**, by the Board of Highway Commissioners for York County, for the supplying of machinery with material, labor and constructing the following highways or parts thereof:

(a) LAKE SHORE ROAD.
(b) WESTON ROAD.
(c) VAUGHAN ROAD.
(d) KENNEDY ROAD.
(e) KINGSTON ROAD.
(f) DUNDAS STREET.

Particular sections are more specifically described, specifications and forms of tender, which may be secured at the office of the Engineer, Room 6, 57 Adelaide street east, Toronto.

MR. R. J. BULL, Chairman.
E. A. JAMES, Engineer to Board.
J. A. RAMSDEN, Secretary. 29-30

CITY OF PORT ARTHUR

Notice

Sealed tenders, endorsed on envelope, "Tender for Completion of Storage Dam," will be received by the undersigned up to 6 o'cock p.m. of **Tuesday, July 25th, 1911**, for the completion of the Service Reservoir Dam at Current River Park.

Further information as to plans and specifications may be obtained from the City Engineer.

A marked cheque for 10 per cent. of the estimated amount of contract must accompany each tender.

The lowest or any tender not necessarily accepted.

J. McTEIGUE,
City Clerk.
Corporation Offices, Port Arthur,
July 13th, 1911 29

COUNTY OF HALTON

Tenders
for Reinforced Concrete Arch and Viaduct

Sealed tenders, plainly marked as to contents, will be received by Wm. Panton, County Clerk, Milton, Ont., up to twelve o'clock noon of **Tuesday, August 1st, 1911**, for the construction of a Reinforced Concrete Arch of 135 ft. span, and 340 feet of Concrete Viaduct Approach, on the Middle Road between the Town of Oakville and the Township of Trafalgar.

Plans and specifications may be seen and all necessary information may be obtained at the office of the undersigned, 57 Adelaide street east, Toronto.

Lowest or any tender not necessarily accepted.

FRANK BARBER,
Consulting Engineer.
Toronto, July 17th, 1911.

Department of the Naval Service

Sealed tenders addressed to the undersigned, and endorsed "Tender for the Erection of Wireless Telegraph Station," at Tobermory, Ontario, will be received at this office until noon, on **July Twenty-ninth, 1911.**

Plans, specification and form of contract to be entered into can be seen on and after July 10th instant, at the office of the Superintendent of Wireless Telegraphs, Department of the Naval Service, Ottawa, the Office of the Agent of the Department of Marine and Fisheries, Parry Sound, Ontario, or the office of the Superintending Engineer of Sault Ste. Marie Canal, Sault Ste. Marie, Ont., or the offices of the Postmaster at Owen Sound, Ont., or the Postmaster at Tobermory, Ont.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, and signed with their actual signatures, stating their occupations and places of residence. In the case of firms, the actual signature, the nature of the occupation, and place of residence of each member of the firm must be given.

Each tender must be accompanied by an accepted cheque on a chartered bank, payable to the order of the Honorable the Minister of the Naval Service, equal to ten per cent. (10 p.c.) of the amount of the tender, which will be forfeited if the person tendering decline to enter into a contract when called upon to do so, or fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

[illegible] the lowest or any tender.

By order,
G. J. DESBARATS,
Deputy Minister
302 Contract Record, Toronto, Ont. 29-29

[illegible] tisement if they insert it without authority from the Department. 29-30

Tenders for Waterworks

Town of Dresden

[illegible] addressed to J. T. Bridgwater, town Clerk, Dresden, will be received up to noon on **Wednesday, the 26th day of July next, for 4,** 6 and 8 inch cast iron water pipe, about 13,000 feet, [illegible] about 35 hydrants, also two half [illegible] pumps.

Plans and specifications may be seen at the offices of either of the undersigned. The lowest or any tender not necessarily accepted.

F. W. FARNCOMB, C.E.,
Consulting Engineer,
64 Bank of Toronto Chambers,
London, Ont.

J. T. BRIDGWATER,
Town Clerk,
Dresden, Ont.

28-29

CITY OF GUELPH

Tenders will be received by T. J. Moore, City Clerk, Guelph, Ontario, for the construction of a plain concrete arch bridge (two forty-foot spans) over the River Speed, Neeve street, Guelph, up to **Saturday, July 29th, 1911.**

Approximate amount of concrete is 385 cubic yards.

A marked cheque for $100.00 is to accompany the tender.

Forms of tender may be obtained from the City Engineer.

Plans and specifications may be seen at the office of the City Engineer, or at the office of the Contract Record, Toronto.

I. MALCOLM,
Acting City Engineer.

Tenders for Steel Bridge

Sealed tenders marked "Tenders for Bridge," will be received up to noon, **Saturday, August 5th, 1911**, for the construction of two spans of 125 feet each and one span of 90 feet, over the Saugeen River.

Also tenders, marked "Tenders for Abutments," will be received up to the above date for the concrete work for two abutments and two piers for the above bridge.

Tenders will be opened at the December session of the County Council, December 6th, 1911.

Specifications may be had from the undersigned.

The lowest or any tender not necessarily accepted.

JAMES WARREN,
Engineer.

Walkerton, July 17, 1911.

Tenders for Steel Bridge

Tenders marked "Tenders for Bridge," will be received by the undersigned, Chesley P.O., up till **August 3rd, 1911**, for the erection of two steel bridges—one over Snake Creek, 10th Concession, Elderslie, and one on the County line, 7th Concession, Elderslie; the span of the bridges, 45 feet and 36 feet respectively. Also tenders for concrete abutments for same will be received at the same time.

Tenders will be opened at the County line bridge on Friday, August 4th, at 2 p.m.

Specifications for same may be had from James Warren, Engineer, Walkerton, after the 25th July.

The lowest or any tender not necessarily accepted.

(Signed) S. K. EWART,

Elderslie, July 17, 1911.

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

WANTED Works Manager or Superintendent's position on water, sewerage, dock, bridge or roadmaking. Highest references, 20 years experience on important public works. Box 302 Contract Record, Toronto, Ont. 29-29

Electrician, practical, theoretical and commercial, open for engagement; 20 years' experience in high tension, overhead and underground work; also designing, erecting and running power plants; good organizer and hustler; first-class references. Box 297, Contract Record, Toronto, Ont.

Business Buildings and Industrial Plants

(Continued from page 61)

ronto; architect, Ellis & Connery, Manning Chambers, Toronto. One storey, 211 x 62, frame covered with iron, concrete foundation. Brantford ready roofing.

Plumbing and steam fitting required for warehouse (Spadina and Sullivan st.). Owner, James Robertson Co., Ltd., Toronto; architect, A. A. Denison & Stephenson, Star Bldg., Toronto. Tenders called until July 17th.

Tenders called for factory, 441 King street west. Owner, F. H. Herbert (in trust), 63 Adelaide street east, Toronto. Architect, F. H. Herbert. Three storeys, 28 x 74, cement foundation, steel beams, brick, reinforced concrete, structural iron, felt and gravel roof, metallic lath, freight elevator, tile, skylights, plate and prismatic glass, electrical work. Tenders called until July 12th.

Vancouver, B. C.

Warehouse. Plans have been prepared by Wright, Rushforth & Cahill, 709 Dunsmuir, street, for a 6-storey mill constructed warehouse building to be erected on Beatty street, at a cost of $60,000, by the Anglo-American Warehouse Co. Tenders closed July 8th.

Victoria, B. C.

Bank. Plans are being prepared for a new Union Bank Building, cost, about $120,000, 6-storeys and basement, steel frame with hollow tile walls, steam heating, complete plumbing equipment, 2 passenger elevators and electric wiring. Work will be commenced immediately after awarding of contract. E. Cox, 209 Carter Cotton Building, architect.

Welwyn, Sask.

Tenders called for reconstruction of elevator. Owner, Farmers Elevator Co., Ltd.; sec.-treas., F. T. Collyer, Welwyn. Necessary material and adding 6 feet to the cribwork. lengthennig of the two legs subdividing four large bins, painting and making necessary alterations and repairs in machinery. Tenders received until July 18; work to be completed August 25.

Winnipeg, Man.

A. Congdon will build stores and apartments on n.e. corner of Portage avenue and McGee street. Cost, $80,000. J. D. Atchison, architect, has prepared plans.

CONTRACTS AWARDED

Hamilton, Ont.

Factory. The contracts have been awarded for a 1-storey factory, 90x70, brick and steel, erected by Sawyer-Massey Co., on Wellington N., as follows: Cement and masonry, Geo. E. Mills, 614 King east, carpentry, Donald Campbell, 96 Burris; sheet metal, John E. Riddell, 12 Ferguson avenue; iron work, Hamilton Bridge Works, Stewart street, Hamilton. Stewart & Witton, Hughson St., S., architects.

Lethbridge, Alta.

Warehouse, $26,000. (Fourth street S.) Owner, Western Supply & Equip. Co., Ltd., Lethbridge, Alta. Supervisor, J. Lockwood, C. E., Lethbridge, Alta. Successful contractors, Messrs. Bains & Davis, Lethbridge. 2-storey and basement, 50x125, brick.

Montreal, Que.

Work in progress for stables, $15,000 (Redpath street). Owner, J. T. Davis, Redpath avenue, Montreal; architect, E. & W. S. Maxwell, Beaver Hall Sq., Montreal; masonry contractor, W. McArthur & Sons, 459 Clark avenue, Montreal; carpentary contractor, J. B. Gratton, Ltd., 82 Mercier avenue, Montreal; heating and plumbing contractor, T. O'Connell, 183 Ottawa street, Montreal. Two storeys, stone and brick.

Car Barns. The contract has been awarded for $51,000 car barns, brick and concrete, being erected by the Montreal Street Railway.

Offices and Warehouse. The contracts for a 5-storey stone and concrete building to be erected by the Salada Tea Co. on St. Paul street have been awarded as follows: General contractors, Reid, Macgregor & Reid, 688 St. Catherine W.; masonry and cement, Reid, Macgregor & Reid, 668 St. Catherine W.; carpentry, D. M. Long, rear 39 Windsor; plastering, Z. Bouchard, 12 Bourget; heating and plumbing, John Sate, 152 Craig street; glazing and paintin, A. Craig, 41 Jurors; iron work, Structural Steel Co., 107 St. James; roofing. Hickey & Aubut, 93 Dominion street.

Offices, $80,000. (41 Union avenue). Owner, Wm. St. Pierre, 41 Union Ave., Montreal. Architect, Findlay & Spence, Beaver Hall Hill, Montreal. General contractor, Heffernan & Beck, Montreal. 6-storeys, 54x96, reinforced concrete.

Offices. (208 St. Catherine street W.) Owner, H. Kellert & Sons, 204 St. Catherine W., Montreal. Architects, Hutchison, Wood & Miller, Royal Ins. Bldg. Montreal. General contractor, C. E. Deakin, 11 St. Sacrament street, Montreal. 5-storeys, concrete.

Toronto, Ont.

Warehouse, $40,000 (Bay and Wellington). Owner, W. R. Brock & Co., Ltd., Wellington street, Toronto; architect, A. R. Denison & Stephenson, 20 King street, Toronto; contractors, masonry, H. Needham, 348 Crawford street; carpentry, Young & Co., 87 Stafford street, both of Toronto; plastering, heating and plumbing to be let yet.

Factory, (Symington Ave.) Owner, W. D. Beath & Son, 193 Terauley street, Toronto. Contractor for foundation, Elnor & Brown, 249 Helens avenue. To-

(Continued on page 66)

BOILERS

Fitzgibbon Type of Boilers built for McLachlin Bros., Arnprior, Ont.

BOILERS, of All Kinds for Any Service

"Inglis" Boilers are Designed and Built by Skilled and Experienced Workmen.

"Inglis" Boilers are Built of the Best Material that can be procured.

"Inglis" Boilers are Made in Shops Equipped with the Latest and Most Modern Machinery.

Workmanship, Quality, Quick Delivery and Fair Prices, together with Fifty-Two 52 Years' Practical Experience, have made "INGLIS" Boilers the "Standard." Write us for prices.

The John Inglis Company Limited

Engineers and Boilermakers

14 Strachan Ave., TORONTO, Canada

[illegible] Work. McGregor & McIntyre, [illegible] street; steel and concrete, concrete foundation, electric lighting, concrete, felt and gravel roof, 1-storey, 130x32, fireproof doors, structural iron and [illegible] metal sash and wire glass required. Contracts for reinforced concrete and skylights not let yet.

Moose, Jaw, Sask.
Bank [illegible]. Owner, Bank of Montreal. Architect, Peden & McLaren, Montreal. General contractor, Navin Bros. Moose Jaw. 2-storey and basement, 50x60, brick and stone, concrete foundation, structural iron, hot water heating, electric lighting, marble, tile, metallic lath, electric bells, plate glass, cornice, artificial stone, vaults, interior finish oak and fir. Contract let July 8. R. G. Bunyard, architect, Moose Jaw, superintending work.

Vancouver, B. C.
Apartment House. The cont.act for the erection of a 4-storey brick store and apartment house at 155 Pender W. has been awarded to W. J. Pront, 1101 Hornby street. Hot water heating and hotel plumbing will be installed. Private plans.

Warehouse. The contract has been awarded to E. G. Baynes for the erection of a 5-stotey brick block with basement, pressed brick, 75x135, $55,-000. Parr & Fee, aichitects.

Business Block. The contract has been awarded to Adkison & Dill for the erection of a 10-storey brick and reinforced concrete building at 325 Howe street for the National Finance Co.

Business Block. The contract has ben awarded to Adkison & Dill for the erection of a $30,000 block at 291 Harris street for Leon Way Company, brick construction.

Weyburn, Sask.
Equipment required for store, Third street. Owner, Lowes Bros., Weyburn, Sask. General contractor, F. Hussey, Weyburn. Two storeys, 25 x 70; cement. Required new bake oven, new counters, and show cases.

Power Plants, Electricity and Telephones

Brockville, Ont.
Equipment for sale. Power plant, (St. Thomas street Station). Engineers, Laurie & Lamb, Board of Trade Building, Montreal. Complete electric generating set, consisting of Leonard Peerless steam engine, direct connected to 150 kw. Canadian General Electric generator, 2,300-volts, 60-cycles; also condenser, switchboard, steam and exhaust piping, spare parts for engine and set as at present installed. Full particulars, etc., obtained from engineers. Advertisement in "Tenders and For Sale Department" of this issue.

Hochelaga, Que.
Gas Meter. The Montreal Light, Heat & Power Co., of Montreal, will erect a gas meter house at Hochelago, cost $7,000.

Nanaim,o, B. C.
Plant of the new Ladysmith Lumber Company, Nanaimo, B. C. Damaged by fire 8th inst.; 2 kilne and shingle mill destroyed; sawmill saved; loss, $15,000 (covered). Plant of the Wallace Shipyards, Ltd., N. Vancouver, the leading industry, swept early Tuesday morning, 200 employed in works, heavy stock on hand, loss $50,000. President Wallace in England.

Penticton, B. C.
Tenders called for installation of generators. Owner, Municipality of Penticton. Engineers, F. H. Latimer, Penticton, B. C. Mather, Yuill & Co., Ltd., 429 Pender street, Vancouver. Supply of material and labor in connection with installation of two 100 K.V.A., 3-phase, 4,600 volt, 900 R.P.M. alternating current generators direct connected to impulse wheels operating at 2,045-ft. effective head; pressure pipe line about one mile of 10-in. and one mile of 12-in. pipe; switchboards, transformers, meters, distribution and street lighting system. Plans, etc., at offices of engineers. Tenders in duplicate received by F. H. Latimer until 8 p.m., Aug. 10th.

Building Permits

Edmonton, Alta.
The following permits were issued recently from the office of City Building Inspector Drabble : Cushing Bros., warehouse and power house, $10,000; Mrs. E. Adkins, house, Seventeenth street, $6,600; Mrs. I. Forbes, house, McKenzie avenue, $3,500; W. Avison, four houses, Seventh street, $12,000.

Saskatoon, Sask.
Recent permits include: W. W. Ashley, frame residence, Saskatchewan Crescent, $4,000; J. Gilke, frame residence, 27th street, $2,800; McDougall & McDermott, frame residence, 8th street, $4,500; Burton & Bowes, frame residence, Broadway, $3,000; W. Richardson, frame residence,20th street, $4,400; Government of Saskatchewan, br'ck and stone addition, lands' titles, $22,500; D. Mills, frame residence, 11th street, $3,-000; Manley & McConnell, frame residence, Lansdowne, $4,500; J. Porter, frame residence, 7th avenue, $2,500.

Winnipeg, Man.
H. Hirsh, two dwellings, Redwood avenue, $6,000; D. M. Webb, dwelling, Banning street, $2,500; Union Bank of Canada , branch bank, Sherbrooke street, $20,000; T. Olsen, dwelling, Strathcona st.eet, $3,500; G. R. Sherebrin, dwelling, McIntosh avenue, $1,-600; G. B. Wheeler, dwelling, Fisher street, $4,000; G. L. Stanwood, apartment, Langside street, $55,000; M. Kerszko, dwelling, Alfred avenue, $1,200; A. Congdon, stores and apartments, Portage avenue, $80,000.

Toronto, Ont.
J. B. Meadows, 2-sty. brick factory, 479 Wellington st. west, $8,000; Col. Selby, six attached 2-storey brick veneer dwellings, Munro street, $8,500; H. J. Jackson, three attached 2-storey brick dwellings, near Humberside on Quebec, $7,700; J. Robertson Co., 5-storey brick warehouse, corner Spadina and Sullivan, $105,000; A. Goddard, one pair semi-det. 2-storey brick dwellings, near Lennox on west side Euclid, $5,500; R. S. Van Vlack, alterations to 3-storey brick apartment house, 80-82 Pembroke, $5,500; Holy Trinity Church, 3-storey brick addition to parish house, 6 Trinity Square, $8,000; Mrs. W. F. Sparling, 2½-storey stone dwelling, near Roxborough on south side Edgar, $10,000; G. A. Evans, 2½-storey brick dwelling, 310 Roxborough east, $10,000; Saml. Young, jr., 2½-storey brick dwelling, Pricefield road, $5,000; Deer Park Presbyterian Church, stone and brick church, cor St. Clair & Foxbar, $60,000; Toronto General Hospital, one-storey brick addition to power house, College st eet, $5,-000; A. N. Garrett, 3-storey brick apartment house, northeast corner Howard and Glen road, $30,000; R. D. McLeod, 2-storey and attic brick dwelling, northwest corner Lonsdale and Lawton, $6,-500; W. B. Dyson, five attached 2-sty. roughcast dwellings, brick fronts, corner Shirley and Northern Place, $5,000; Jas. Bodie, one pair semi-det. 2½-sty. brick dwellings, north side Bain avenue, $5,500; A. De Zorzi, two pair semi-det. 2-storey brick dwellings, Ossington Crescent, $7,600; F. Merrill, 3-storey brick addition to factory, 93½ Church street, $6,000; O'Keefe Brewery Co., 2-storey steel, brick and concrete warehouse and garage, near Gould, east side Dalhousie, $15,000; W. W. Hiltz, four pair semi-det. 2-storey roughcast dwellings, 65-79 Chester avenue, $15,-000; C. Coulter, three pair semi-det. 2-storey brick dwellings, near Markham on London street, $12,000; R. Lankin, two pair semi-detached 2⅜-storey r.c. dwellings, brick fronts, 152-4-.-8 Curzon, $6,000; Board of Education, 2-sty. brick school, Manning avenue, $10,000; Mr. McLaughlin, three attached 3-sty. brick stores, near Clinton on east side Bloor west, $9,000; H. T. Love, 3-sty. brick store and dwelling, 492 Bloor W., $7,000; Globe Publishing Co., 3-storey alteration and addition to offices, corner Yonge & Temperance, $7,000; Wm. Hodgkinson, four rows of 3 att. 2-sty. roughcast dwellings, brick fronts, near Myrtle on Curzon, $22,000.

Fires

Eganville, Ont.
Anglican, Presbyterian and Methodist churches, 2 newspaper offices and mills, $250,000 loss.

Owen Sound, Ont.
Canada Cement Co's plant, Shallow Lake, loss not estimated.

Thorold, Ont.
Coniagas Reduction Smelter, loss about $15,000.

Embrum, Ont.
Mr. Menard's residence, Mr. Benoit's hardware store, house and stables, etc., loss about $20,000.

Business Notes

Parry Sound, Ont.
Change of location contemplated for factory. Owner, Brown Smith Turning Co., Broadbent, Ont. The above Company are contemplating moving their factory to Parry Sound. General Turning Business.

MacLean Daily Reports

The only systematic method yet devised for reporting BUILDING AND ENGINEERING projects from their inception to completion. Ask us for Rates and Specimen Reports.

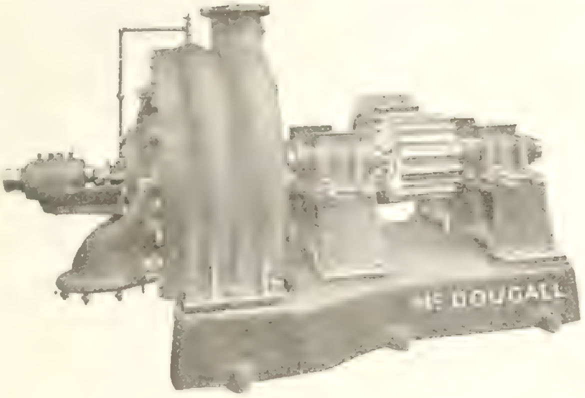
220 King Street West - TORONTO

Turbine Fire Pumps

This 6″ turbine pump geared to a water wheel at the Chicoutimi Pulp Co., has a capacity of 833 Imperial gallons per minute against a pressure of 100 lbs.

For other illustrations of turbine pumps in fire service see

Bulletin No. 109



THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.
LIMITED

WORKS:
512 William St., MONTREAL

SALES OFFICES:
MONTREAL, TORONTO, COBALT, WINNIPEG, CALGARY, VANCOUVER

WIRE

ROPE

When sending in your enquiry for quotations on wire rope, satisfaction is assured if you state conditions under which the rope is to be operated. We make a large variety of wire ropes; and can always ship you a rope that will be of

Satisfactory Quality at a Satisfactory Price

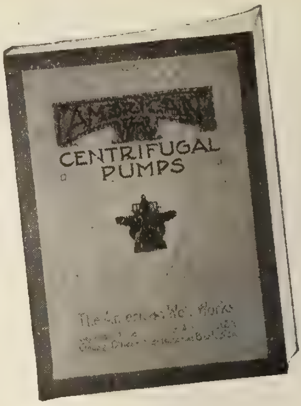
For Swedish charcoal rope we import a high-grade Swedish Rod which is drawn and tested in our own mill. For our standard crucible cast steel, best plough steel acme steel ropes a special steel wire is made for us by a reliable British firm. We also manufacture rope fittings and a special rope grease for lubricating purposes.

Catalogue No. mailed on request

The B. Greening Wire Company, Limited
HAMILTON, ONT. - MONTREAL, QUE.

Why "American" Centrifugals

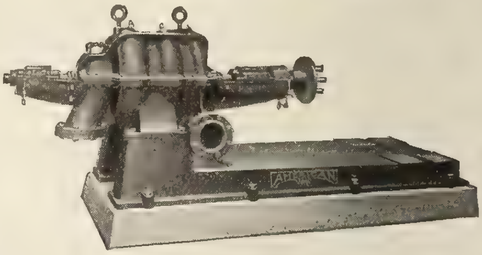
Are Most Economical in the Widest Range of Pumping Conditions.



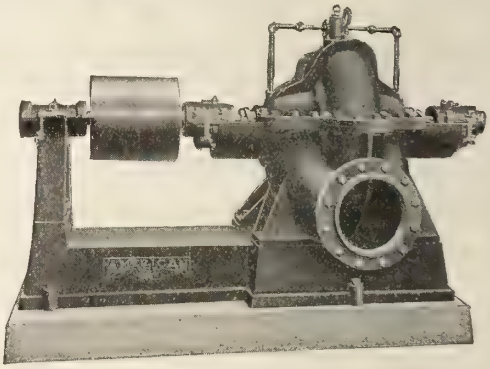
The reason why "American" Centrifugals are unequalled for economy is that they represent the highest development of the most modern type of pump and there are the best of reasons for this higher development.

Instead of building a single type of centrifugal and recommending it for every purpose "American" centrifugals are built in over fifty distinct types and every size of every type is carefully tested in our own complete hydraulical laboratory and its efficiency proved before it is permitted to leave our works.

It must meet our standard of efficiency before it is allowed to leave our works and that is what is making the American trademark famous in pumping machinery.

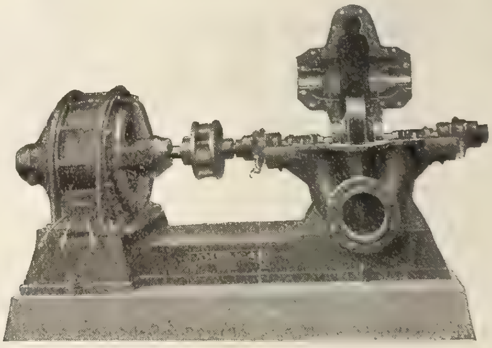


AMERICAN



"American" centrifugals attain up to 80 per cent. mechanical efficiencies and many of our specially designed pumps, installed according to our own specifications, show much higher efficiencies, enabling them to operate against high heads. We have many single stage centrifugals installed operating on over 200 feet heads.

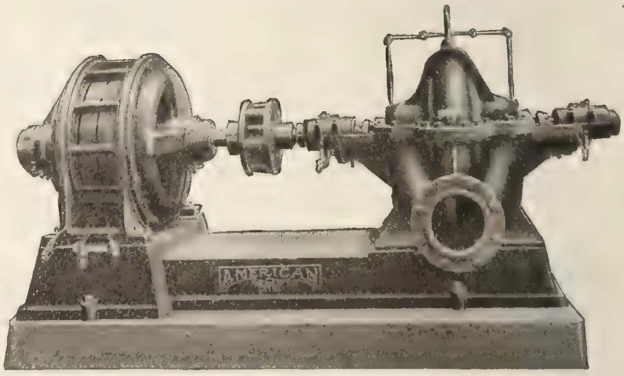
The low first cost of "American" centrifugals as compared with old style plunger pumps, combined with their high efficiencies, low cost for attendance and small cost for repairs make them **far more economical** than any other type of pump in nearly all conditions where **all costs are considered.**



Greatest economy in the end is the claim we make for "American" centrifugals and we are ready to prove that claim.

If you are interested in irrigation, write for our booklet, "Irrigation by Pumping" Bulletin No. 118.

Our General Centrifugal Pump Catalog No. 117 is the most complete ever issued. Write for it today.



The American Well Works

General Office and Works: Aurora, Ill., U. S. A.
Chicago Office: First National Bank Building

Canadian Sales Agency:
234 Craig Street West, Montreal
441 Seymour Street Vancouver, B.C.

Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

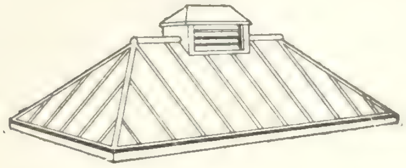
Get our catalog and prices. They will interest you. All goods guaranteed.

Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

"A work ill done must be twice done—only the best gives satisfaction."

—The Philosopher of Metal Town.

Metallic Skylights
Are Practically Imperishable



The framework is of hollow metal, galvanized steel or sheet copper and when glazed with **wire glass** is **absolutely fireproof.** We make all shapes and sizes.

The exclusive features of "Metallic" Skylights make for permanency and absolute satisfaction. See that they are specified in contracts.

Information and prices on request.

Manufacturers

1952

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Do You Think

that you can Afford

to pass us by before getting our prices on your requirements or before putting in your tenders on

Plate Sheet Fancy

or any kind of

Glazing Glass

The
Consolidated Plate Glass Co.
of Canada, Limited

TORONTO MONTREAL WINNIPEG

BRYAN DOORS

Noted for their Beauty and Durability

Send us your specifications for quotations

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario

When you think of Metal Ceilings think of GALT

A Contractor needs our Metal Ceilings—Because they can be erected

By	ANY	Carpenter
At		Time of the Year
In		Kind of Weather

Plans, Instructions, Wood Bracket and Nails Furnished Free.

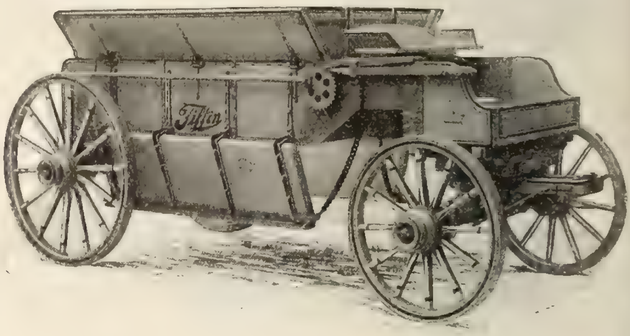
Get Catalogue A-3

THE GALT ART METAL CO., LIMITED
GALT, ONTARIO

Tiffin Dump Wagons

Flushing Machines, Sprinklers
and Municipal Vehicles

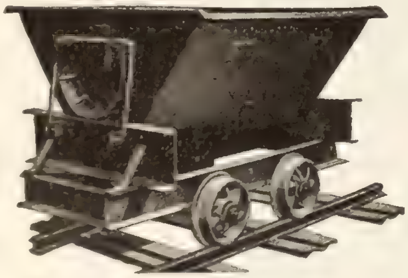
are the best builded devices in the United States



The Tiffin Wagon Co.

TIFFIN, OHIO

CARS - BUCKETS - SCREENS



High Quality
Low Prices
Quick Shipments

IF you require any equipment send for our Catalog No. 31-A which illustrates a complete line of this material.

¶ We make any kind of Car or Bucket you want for handling concrete—clay—stone—cement blocks—or anything else.

Carry Standard Sizes in Stock

Write us — we can save you money

SACKETT - CHICAGO

1691 Elston Ave., Chicago, Ill.

Vault Doors and Safes

J. & J. Taylor

Toronto Safe Works
Established 1855 TORONTO
Branches: Vancouver and Winnipeg
Montreal

ORNAMENTAL IRON WORK
WIRE CLOTH AND WIRE GOODS

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Everything in Lumber for the Contractor

Fir, Hemlock, Spruce, Pine and Oak Timber and Lumber

We specialize in

Southern Pine Timber and Piles

10,000 Green Tamarac Piles for Immediate Shipment. Get our Prices.

THE ELMITT LUMBER CO. LIMITED, OTTAWA, ONT.

The Smith Marble and Construction Co., Ltd.

Montreal

Office & Factory:
145 Van Horn Ave.

Show Rooms:
458 Blury Street

Importers,
Manufacturers,
Contractors

OF

Interior and Exterior Marble, Slate, Floor and Wall Tiles, Mosaics, Plumers and Electrical Marble, Granites for Building and Monumental Work.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.

Toronto Agent
A. P. STEWARD - Builders' Exchange

A STRONG TESTIMONIAL

"Best Paving Block Made"

Kalamazoo, Michigan, U. S. A.,
June 13, 1910.

"We used Metropolitan Block in 1895 and the best recommend I can give is that we have used many more of them nearly every year since."

(Signed) H. A. JOHNSTON,
City Engineer

Quality is Economy
in Paving Brick

**"Metropolitan Block"
Make Permanent Pavements**

The Metropolitan Paving Brick Co. - Canton, Ohio

Hardwood Flooring and Interior Finish

"Wilson Bros. Limited" on flooring means a carefully kiln dried and well manufactured article. Our flooring is straightened, hollow-backed, bored, end-matched, steel polished and bundled. -:- -:- -:-

We specialize in Veneered Doors to detail.

Wilson Bros. Limited **COLLINGWOOD, ONT.**

The Mushroom System

Of Reinforced Concrete is strong, economical and durable. Based on scientific principles, every pound of steel does the work it is designed to do.

The system is fully covered by broad patents in Canada, the United States, and all civilized foreign countries.

For lists of buildings, descriptive literature and estimates, address

C. A. P. Turner, M. Am. Soc. C. E.
816 Phœnix Building, Minneapolis, Minn.

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

---

Crushed Stone, Limited

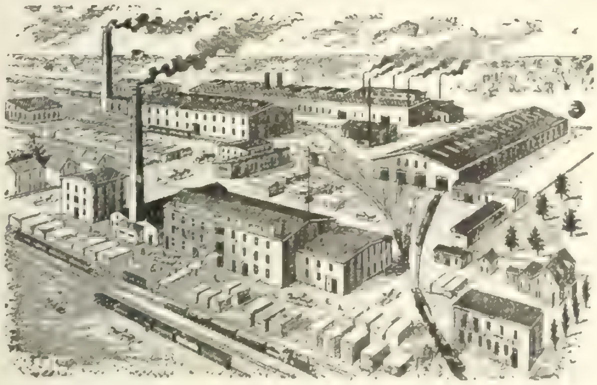
STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Rhodes, Curry Co., Limited

Lessees



Bank and Office Fittings

SCHOOL DESKS A SPECIALTY

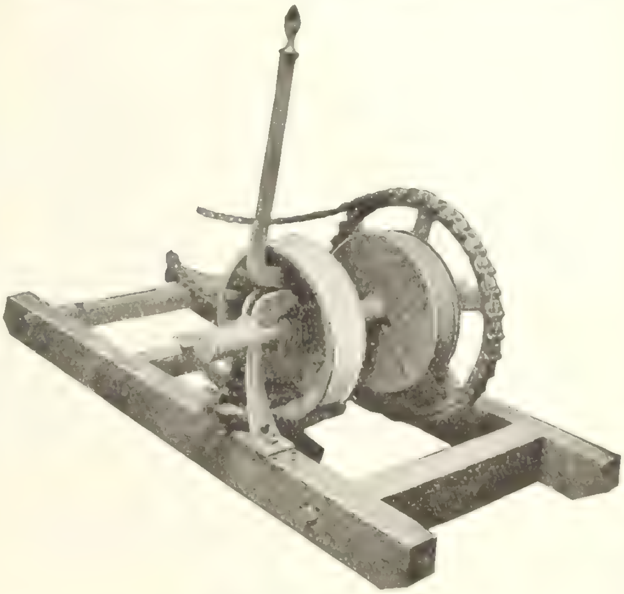
We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc.

In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

Rhodes, Curry Co., Ltd. Amherst, N. S.

BRANCHES AT
Halifax Sydney

DO YOU WANT A GOOD HOIST?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	**Mortar Conveying**	**Well Digging**
Bridge Building	**Sewer Building**	**Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited

Engineers and Machinists **London, Canada**

Improved Singer No. 4
Block Machine

[illegible]

It Makes

Face Down Blocks

Blocks 4", 6", 8", 10", 12", 16" and 24" long, 4", 6", 8", 10" and 12" wide.

All Blocks on One-size Pallet.

Sold in combination to [illegible] teed against defect [illegible]

Vining Mfg. Co.

Niagara Falls, Ont.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President Jas. W. Moffat, Secretary
Thos. C. Irving Jr., Vice-Pres. Chas. Warnock, Treas. & Man.

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories: Canadian Express Bldg., Montreal, Que.
Branch Offices: Traders Bank Building, Toronto, Ont.
Norfolk House, Laurence Pountney Hill, London, E.C.

Note tremendous metal weight on this floor. Entire building of Alsen's Cement reinforced concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

for concrete reinforcement is made from high carbon, cold drawn wire. The process of cold drawing eliminates the possibility of flaws. Perfection Wire Mesh is necessarily perfect.

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

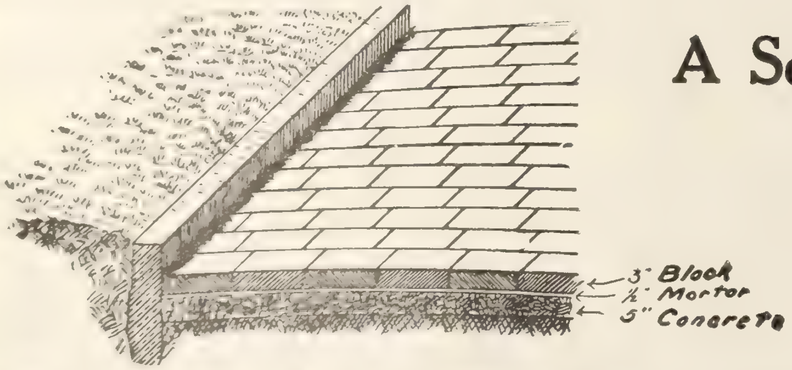
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Lap Welded Steel Pipe

MADE IN SIZES

12 to 72 inches Diameter

Used extensively for Water Supply for Mines, Mills, Hydraulic Operations and High Pressure Hydro Electric Installations.
Ask our Welded Pipe Dept. for prices.

American Spiral Pipe Works

MANUFACTURERS OF

SPIRAL RIVETED PIPE LAP WELDED PIPE
FORGED STEEL FLANGES

50 Church St. New York Box 485 Chicago, Ill.

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)
"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."

W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.
1032 Garfield Building, CLEVELAND, OHIO
SELLING AGENTS
The Dominion Equipment & Supply Co., Winnipeg, Canada

Are You Interested

in

Concrete Construction

The latest method in this work for making concrete tougher waterproof and a better color is to incorporate in your mixture

Guelph Hydrated Lime

This lime is very fine and fills all voids. It also prevents the concrete from drying too rapidly.

Specify **Guelph Hydrated Lime** for your next job, its the coming for use with cement.

Standard White Lime Co.

Guelph, Ontario

EQUIP YOUR CELLAR

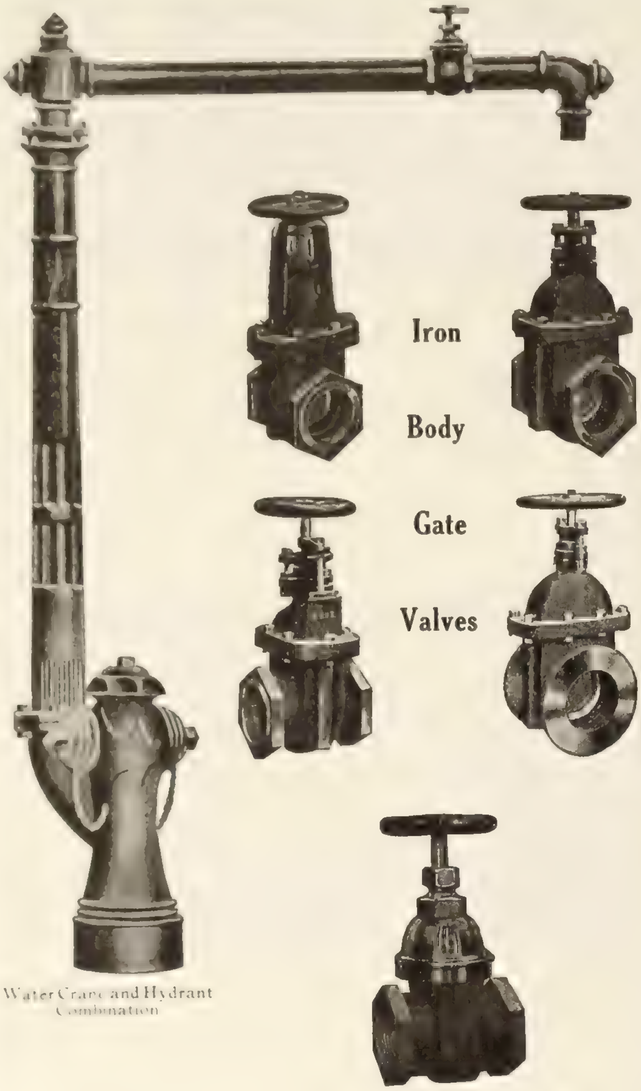
with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

Send for our illustrated booklet, it shows and describes our full line of Coal Chutes

The Down Draft Furnace Co., Limited

Galt, Ontario, Can.

Montreal Representative: E. F. Dartnell, No. 8 Beaver Hall Square.

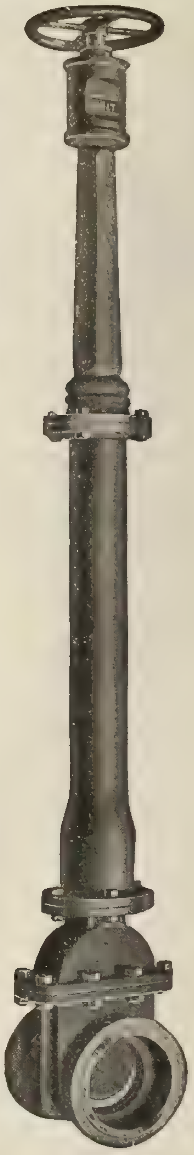


Water Crane and Hydrant Combination

We Make KERR Valves and Hydrants

for every branch of waterworks construction

"Weber" Gate (Brass)



Indicator Post for Fire Protection Valve

Every part of every "Kerr" valve is accurately made and finished, making them reliable under all conditions

A system of waterworks is not a proposition that a city or town has to undertake very often and it is a big saving to have the first installation done properly by specifying the best of materials. "Kerr" goods have a reputation for being reliable and lasting.

Shall we send you a catalogue?

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

IRON STAIRS

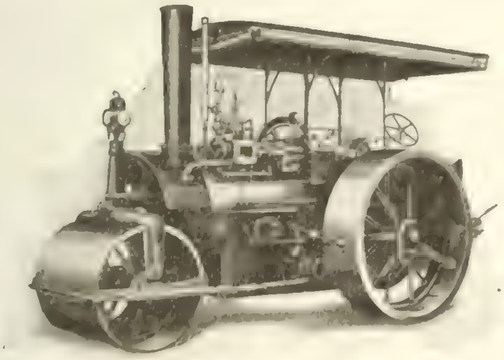
Dennis Wire & Iron Works Co.
Limited
London, Canada

Toronto Offices - 12 QUEEN STREET E.

Cut shows a Brown Hoist Locomotive Crane at work on the New York-Catskill Aqueduct. This crane is doing the excavating; placing the forms; handling the concrete in tubs; and covering up, besides the other miscellaneous work. *Catalogues are sent on request.*

THE BROWN HOISTING MACHINERY COMPANY,
Main Office and Works, CLEVELAND, OHIO.
Branch Offices, Frick Bldg., Pittsburg, Pa. 50 Church St., New York City

There are over 100 Waterous Rollers in use in Canada to-day



The Waterous Roller
"A Canadian Roller for Canadian Roads."

That means that there is at least one in use in every province in the Dominion, working on all kinds of roads, under all sorts of conditions. Their universal success proves their right to the title "The Canadian Good Roads Pioneer."

The Waterous Roller is built in three sizes, 10, 12 and 15 tons. Carries a double crank engine, a quick-steaming locomotive type boiler of large capacity has two speed gearing cut from the solid steel for fast and slow work. Supplied with all standard engine and boiler fittings.

If there is no Waterous Roller in your neighborhood, write for our complete Roller catalogue No. 301 or visit us at our Brantford works and see the Roller being build and tested—a practical demonstration that is its best selling argument.

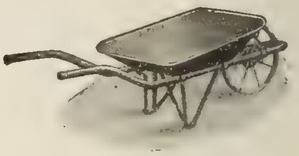
The Waterous Engine Works Co., Limited
Brantford - Canada

The Meaford Wheelbarrow Co., Limited

MEAFORD, ONT.

Manufacturers of

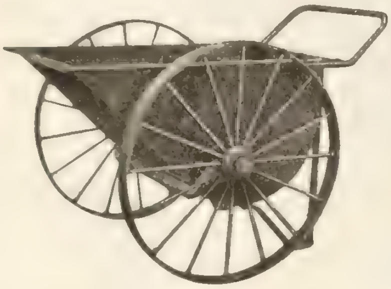
Wheelbarrows of every description, for every purpose. If it is a Wheelbarrow you want we have it in Railroad or Navy, Steel Tray or all Steel, Garden or Lawn.



Wheel Scrapers, pressed bowl or square box in two sizes Nos. 2 and 3.

Drag Scrapers, pressed steel handles on top or sides, with or without runners.

Ox Shovels, Fresno or **Buck Scrapers**

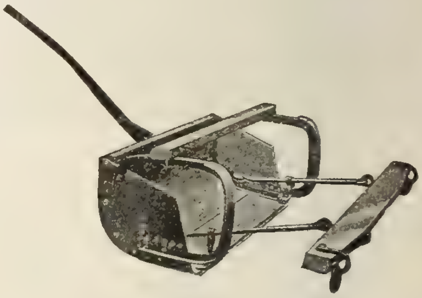


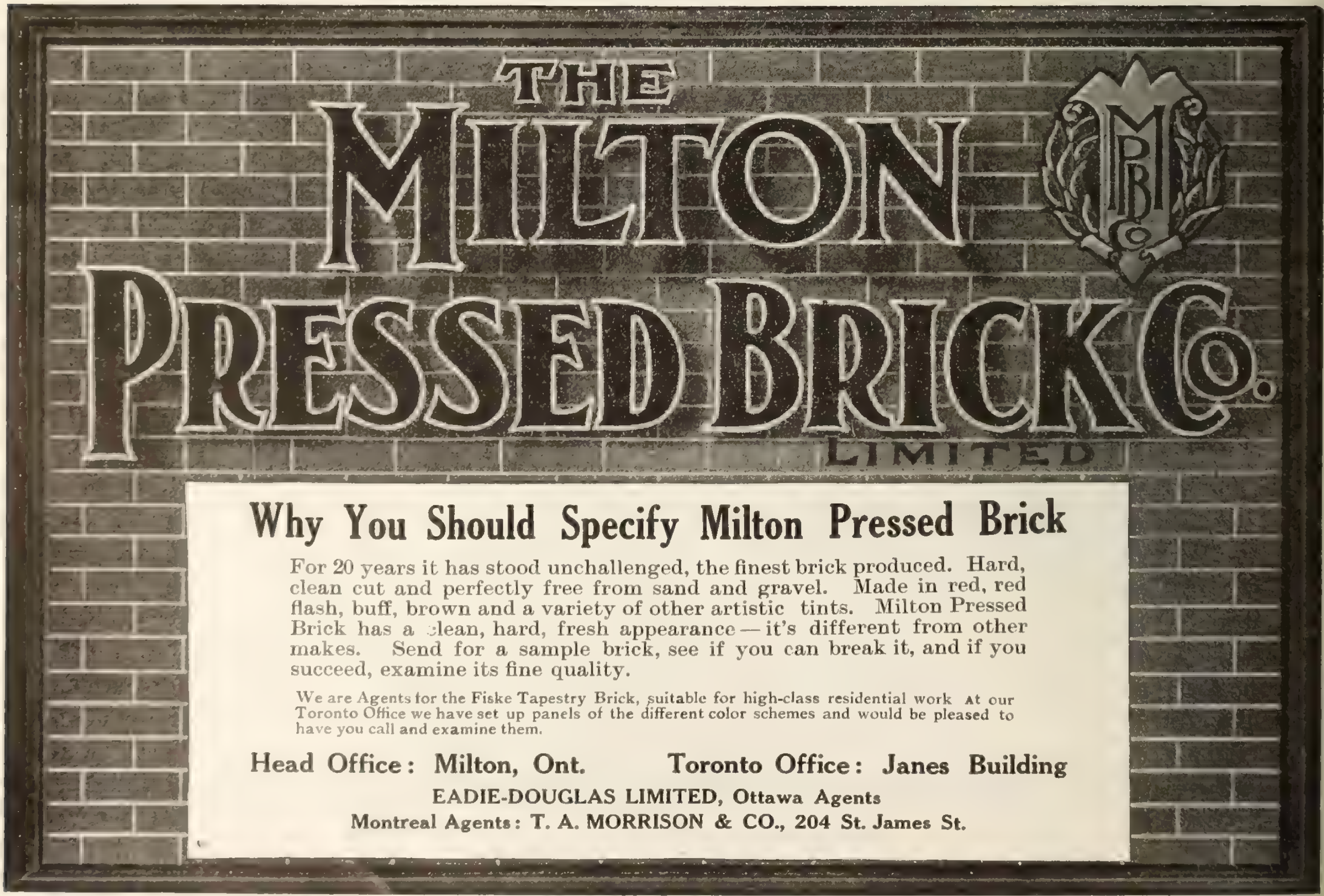
Dump Carts, Dump Cars, Grading Ploughs

Trucks, Bag, Warehouse, Platform

Sterling line of Roller Bearing easy pushing Concrete Wheelbarrows and Carts

Write for prices and complete catalogue





THE MILTON PRESSED BRICK CO. LIMITED

MPB Co

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

We are Agents for the Fiske Tapestry Brick, suitable for high-class residential work. At our Toronto Office we have set up panels of the different color schemes and would be pleased to have you call and examine them.

Head Office: Milton, Ont. Toronto Office: Janes Building

EADIE-DOUGLAS LIMITED, Ottawa Agents

Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

A Kankakee Job Tells a Story

Kankakee, Ills.
Sept. 17th, 1910.

Gentlemen,
I send you a card showing your dump box being hoisted up to the third floor of this Court House, teamster and 1100 bricks.

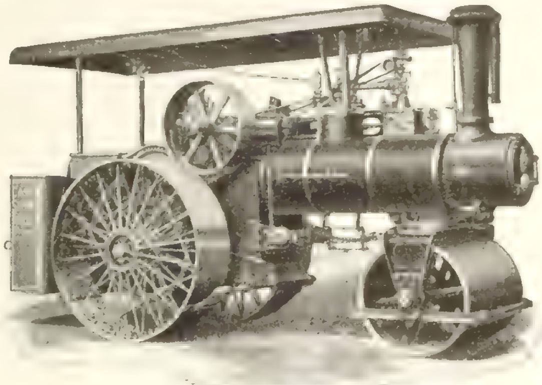
A. SOUPAIT, Supt.

You may not want to use a dump box as a dump bucket. But if you are looking for a box that is strong and easy to handle, here's the best evidence in the world about the TROY. *And the price is Right.*

Get Bulletin 2.

The Troy Wagon Works Co.
N. Market St., Troy, Ohio.

The Only Spring-Mounted Road Roller Built



CASE 36 H. P. 10 Ton Road Roller

Time price, with Simple Cylinder, $2,200; with Compound Cylinder, $2,300
F. O. B. Factory, Racine, Wis., U. S. A.

Six per cent. discount for Cash.

Send for Road Roller Catalog 27 which gives full description.
Case Rollers have greater fuel and water capacity than others

We sell the well known line of Troy Dump Wagons and Dump Boxes

Address: ROAD MACHINERY DEPARTMENT

J. I. Case Threshing Machine Co.
Racine, Wis., U. S. A. (Incorporated)

Canadian Branches, Winnipeg, Manitoba; Calgary, Alberta; Regina, Saskatchewan; Toronto, Ontario.

Send for our Contractors' General Purpose Engine and Municipal Tractor Catalog 26.

MODERN CONTRACTORS' PLANT

THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18″ x 26″ cylinder Mogul, Standard Gauge, and 18-10″ x 14″ Vulcan and Davenport dinkeys, 36″ Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36″ Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8″ Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag Scrapers an 1—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36″ Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW
May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. and Dolland Lane - - MONTREAL, CANADA

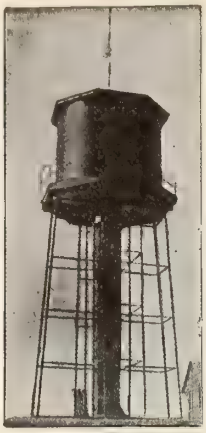
Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A.



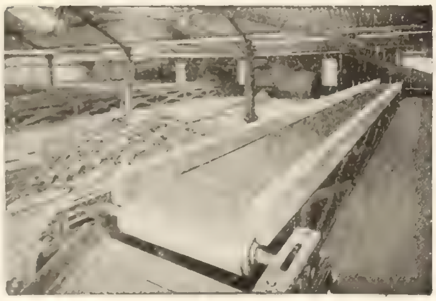
Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG



Scandinavia Belting

The Ideal Conveyor Belt
Good in wet and dry places

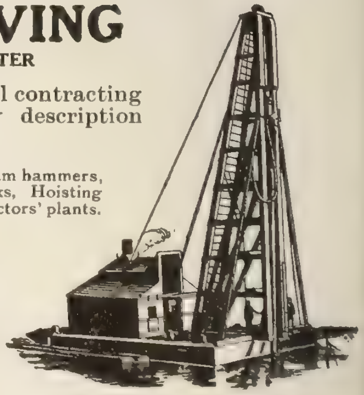
Federal Engineering & Supplies, Limited

284 Yonge Street, Toronto
329 St. James St., Montreal

THE
Thames Quarry Co.
St. Mary's, Ont.

CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

JOHN BONIS, Manager
Office Phone 110a
Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.



PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.

Office: 64 Niagara St.
St. Catharines, - Ont.

The
Missisquoi Marble Company
Limited

Canada's Pioneer and Leading Concern in the Marble Business

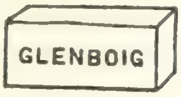
They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd.	Toronto, Ont.
C. N. Barclay	Winnipeg Man.
Bosse & Banks	Quebec, Que.
General Contractors Supply Company, Ltd.	Halifax, N. S.
129 Sparks Street	Ottawa, Ont.
James Robertson Co. Ltd.	St. John, N. B.
G. R. Duncan	Fort William, Ont.
Walker & Barnes	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd.	Vancouver, B. C.
315 Coristine Building	Montreal, Que.

PROVED!
That
A Glenboig Furnace Saves Fuel

Because it can be more quickly heated up. The heat is better retained and more efficiently utilized owing to the non-corrosing character of the fabric.



Every Glenboig Brick bears the brand

No Melting. No Cracking and Splitting off. High Reflective Power.

Send for Further Particulars.

MAKER'S SELLING AGENT

Alexander Gibb
13 St. John St. - MONTREAL, Que.

The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another.

Tide Water Iron Works
HOBOKEN, N.J. U.S.A.

Everything for the Builder
At the Right Price

Interior Trim
Mouldings
Turnings
Stair Building
Lumber
Lath
Shingles
Sash
Veneer Doors
Pine Doors
Frames
"Empire Brand" Hardwood Flooring

LET US QUOTE YOU

J. R. Eaton & Sons
Limited
Orillia, Ontario

Sand and Gravel

Lime
Cement
Plaster
Hair
Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C.P.R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDER'S GAZETTE
VANCOUVER
Builders' Supplies
JOHN GUNN & SONS
Contractors' Machinery
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered t Toronto:—

	Per B.
o. 1 dry pressed red brick	$18.00
o. 1 dry pressed buff brick	18.00
ed Stock Bricks	12.00
rey Stock Bricks	11.00
Vire cut bricks for foundation work	11.00
orous terra cotta bricks	15.00
o. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, lamilton and London. These prices are f o.b., ith 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
0 to 25 united inches	$4.25	$ 6.25
6 to 40 "	4.65	6.75
1 to 50 "	5.10	7.50
1 to 60 "	5.35	8.50
1 to 70 "	5.75	9.75
1 to 80 "	6.25	11.00
1 to 85 "	7.00	12.50
6 to 90 "	....	15.00
1 to 95 "	....	17.50
96 to 100 "	....	20.50
01 to 105 "	....	24.00
06 to 110 "	....	27.50

The following are wholesale prices for glass t Montreal and jobbing prices at Winnipeg for ox lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
0 u. i.	4.75	4.25	8.75	6.50
0 u. i.	5.00	4.75	10.00	7.50
0 u. i.	5.25	5.25	11.50	8.50
0 u. i.	5.75	6.00	12.50	9.50
5 u. i.	....	....	14.00	10.50
0 u. i.	....	....	16.50	11.50
5 u. i.	....	....	18.00	13.50
00 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, 2.10; 40-inch Break, $2.20. Montreal discounts –Single, 25 and 5 per cent. off; D. D., 40 and 0 per cent. off. Winnipeg prices are net.

BUILDING TILES
(Installed in Toronto).

loor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.
loor Tile—½-inch square, 65 cents.
Vall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite, 55 cents per square foot.
iterous Tile—All sizes, according to color, 55 to 65 cents.
lazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
apping Coves and Corners, special quotations to suit requirements.
)palite Tile—3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.
Vhite glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

tandard compression work, 65 per cent.
ligh grade compression work, 60 per cent.
uller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

quare head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

0-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¼ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.
Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.
7 and 8-inch pipe, 50 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.
Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.
Binder stone, $1.30 per ton, f.o.b. Toronto.
Burnt River rubble stone delivered, $15 to $16 per toise.
Free stone delivered, $15 to $16 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.

PAINTS AND OILS
(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.
Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.
Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.
Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.
Turpentine, in barrels, 8cc per gallon.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.
Brown sills and heads, in the rough, delivered, 40 cents per foot.
Rubble stone in car lots, $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds. delivered f.o.b. Toronto.
Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.
Lime, per cwt., delivered, 38 cents.
Plaster of Paris, per barrel, deilvered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Expanded Metal, No 10 gauge, 3½ cents per square foot

AUTOMATIC SASH HOLDER

saves cord, weights, pulleys, and materials—no pockets—easier to install- for old and new windows. Send for sample and catalgue to day Agents wanted. Sold by the hardware trade or direct from 277 Broadway, New York.

Automatic Sash Holder Company

Bonds of Suretyship for Officers and Employees in positions of trust.

Bonds Bid and Supply in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies.

The
Guarantee Company of North America

The Pioneer Company. Established 18[illegible]

Head Office - Montreal

Capital and Resources over $1 965,000
Claims Paid over - - - $2 265,000

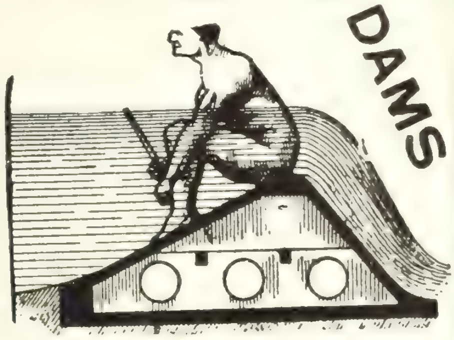
NO CLAIMS IN DISPUTE

This Company is not a party to any premium tariff combination

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract

The Silica Barytic Stone Company of Ontario, Limited

WALTER MILLS
General Manager.
Head Office:
INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
50 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

DOMINION BRIDGE CO.
LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers,
Joist Hangers, Stirrups, Etc.

BUILDERS and CONTRACTORS

Water Washed Sand
Crushed Granite
Crushed Lime Stone

Prompt Attention
Given Orders
at
Our Dock
Spadina Ave.
PHONES
Office - Adel. 1947
Yard - Adel. 1948

SAND & SUPPLIES, LIMITED
TORONTO

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

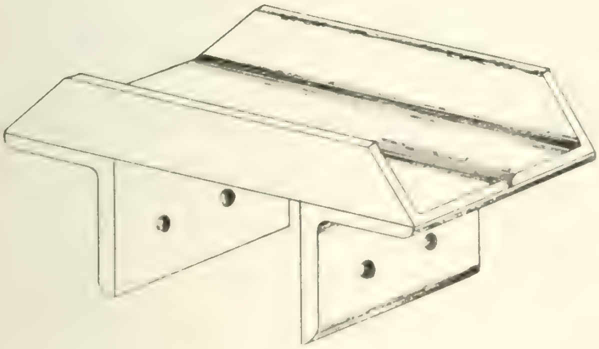
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

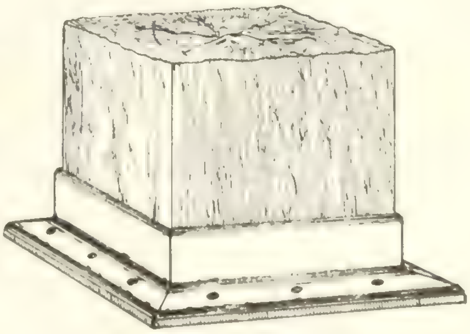
Wm. McNally & Co. - Montreal

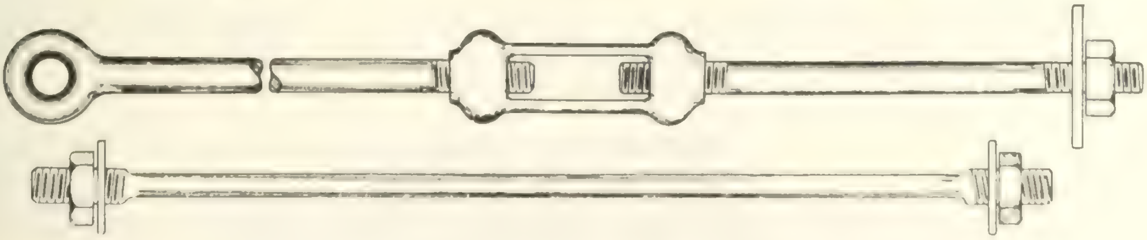
The Hamilton Bridge Works Company Limited

Hamilton, Canada



STEEL POST CAPS
and BASES
for Wooden Posts,
any size.
Also made in
Cast Iron





EYEBOLTS, TURNBUCKLES and RODS of all descriptions

Beams, Angles, Channels, Plates, any size from 1½ inch to 24 inches, and any length up to 70 feet

S. S. SELMAN, President
A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF
GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE
FOR WATERWORKS SYSTEMS
We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners
Contractors

USE

Hard Wall Plaster
instead of lime for plastering
Walls and Ceilings
and get your building
One Month Earlier

H. W. Calkins
Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President. J. G. Allan Vice-President. James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter
for Water, Gas, Culvert and Sewer
HAMILTON, ONT.

The Canada Iron Corporation, Limited

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by
Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments
Works and Offices: Ashbridge's Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power
Civil Engineers
TORONTO WINNIPEG
Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN
CONSULTING ENGINEERS
STEAM, ELECTRIC AND HYDRAULIC POWER
43 KING ST. WEST - TORONTO

T. Harry Mace
ENGINEER
Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete
630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.
Bowman & Connor
Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae
CONSULTING ENGINEER
Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON
ENGINEERS
Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.
405 Dorchester Street East, MONTREAL

John. T. Farmer
MECHANICAL AND
HYDRAULIC ENGINEER
427 Coristine Bldg., Montreal

EDW. O. FUCE
Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor
CIVIL ENGINEER
GALT - ONTARIO
Sewerage, Sewage Disposal, Water Works,
Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell
Consulting and Supervising
Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.
A. M. Can. Soc. C. E. A. M. Am. Soc. C. E.
Consulting Civil and Municipal Engineer
SPECIALTIES
Waterworks, Sewerage and Sewage
Disposal Reinforced Concrete.
315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C. E.
Consulting Engineer
Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work
1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY
Mem. Can. Soc. C.E.
Civil and Hydraulic Engineer
Water Power Development, Water Supply
Systems, Irrigation, &c.
Consultations, Reports, Plans.
Suite 413, Pacific Block, Vancouver, B. C.

JOSEPH N. ROULEAU
Submarine Diver
Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.
793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.
Consulting, Civil and
Sanitary Engineers
General Municipal Engineering
Specialties: { Waterworks, Sewerage
and Electric Lighting.
Winnipeg and Calgary
John Haddin E. L. Miles

Allan Keefer
Architect
Ottawa, Ontario

Arthur L. Weeks
Architect
Canada Life Building, Ottawa
Reinforced concrete and steel structures, factories
and commercial buildings

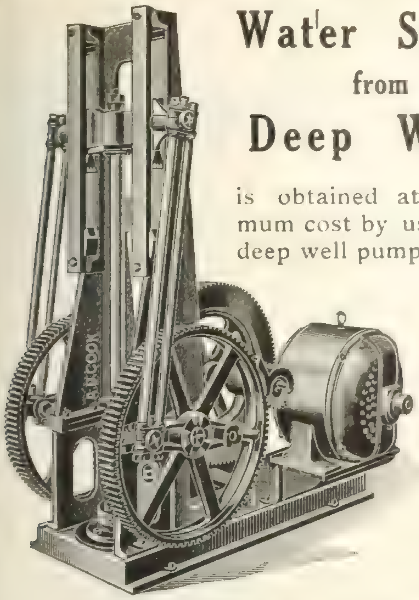
NADEL & ADLER
375 St. James St., MONTREAL
The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Jas. A. McIlwraith
General Contractor
For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.
COLLINGWOOD, ONT.

TRADE MARK TAMCO
FOR SALE
"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.
Limited
MANUFACTURERS OF
Building Granite, Granite
Setts, Curbing, Etc.
Samples Furnished and Prices Quoted on
Application
Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.
Bank of Ottawa Bld'g.
224 St. James St. Montreal
Bell Tel. M. 4354

Rails for Contractors, Switches, Girders, etc.
New and Second Hand.
Locomotives and Cars
JOHN J. GARTSHORE
58 Front Street W., TORONTO



Water Supply from Deep Wells

is obtained at a minimum cost by use of our deep well pumps.

Write for Bulletin 26 explaining the use of Cook's Patent Brass Tube Well Strainer

A. D. COOK

Lawrenceburg, Indiana, U. S. A.

Manufacturer of a Complete line of **DEEP WELL SUPPLIES** including Steam, Belt and Motor Driven **DEEP WELL PUMPS**, Wind-mill and Hand Pumps, Working Barrels and Valves, Pump Rods and Pump Rod Joints, Drill Rods and Drill Rod Joints, Drilling and Well Tools.

CATALOGUE MAILED UPON REQUEST.

PURE WATER

It is easy to obtain with our plants and apparatus

We design and contract for complete municipal filtration plants of any capacity.

We supply and install apparatus for sterilizing water supplies by the application of calcium hypochlorite.

Literature, Sketches, Estimates and Recommendations Supplied on Request

American Water Softener Co.

1001 Chestnut St., PHILADELPHIA, Pa.

We have no affiliations or working acquirements with any of our competitors.

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILE, CRESTINGS, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor

Montreal Agent: E. F. DARTNELL, 157 St. James St. **Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade**

"Old Sol." Harnessed
BY
Luxfer Prisms

By a careful and scientific study of the requirements of store and warehouse lighting and by years of experience the "LUXFER PRISM" products have attained the highest degree of perfection.

With this system daylight is handled as though it were a stream of water and is delivered to dark basements and improperly lighted warehouses and stores.

Luxfer Prism Company,
100 King Street West - - Toronto

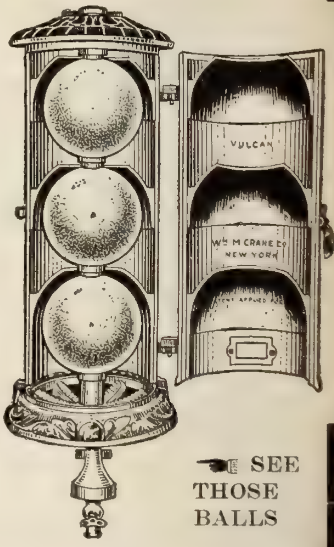
Make Your Buildings Rentable
By the Addition of
Gas Ranges and Water Heaters

When a tenant steps into a home, apartment or flat, and there finds a gas range and water heater set up ready for use in the kitchen, it makes a very favorable impression on him. The little extra cost is more than off-set by returns from a satisfied tenant. Gas water-heaters especially are not things to be carried from one house to another; besides, conditions vary—one water heater may not just suit the newer conditions. It pays to have

The Vulcan Gas Ranges and Water Heaters

installed. They keep a house or apartment in a much cleaner and healthier condition. Once installed there is no danger of damaged walls and staircases through careless carrying in and out of tenants' own stoves. The Vulcan goods are also made strong. Parts can be replaced so easily. The Gas Company cleans the burners once every three months without extra charge (Toronto homes only). This promotes lasting satisfaction. Tenants remain, because of the increased acommodation. Let us have a talk on the matter. We can supply interesting particulars. We are at your service. Remember also, that we inspect Toronto piping contracts for you free of charge, to insure efficiency. Act to-day. Consultation free. Prices right. Terms easy.

THE CONSUMERS' GAS COMPANY OF TORONTO
12-14 ADELAIDE ST. WEST - - PHONE MAIN 1933



☛ SEE THOSE BALLS

Canada Wire & Cable Co., Ltd.

Announce the Opening of their New

Wire, Cable, and Wire Rope Works

at Toronto

The Product of our Electrical Wire Department will include

Electrical Wires and Cables

in Aluminum and Copper

BARE AND INSULATED—FOR ALL PURPOSES.
GALVANIZED IRON TELEGRAPH AND TELEPHONE WIRE

The Product of our Wire Rope Department will include:

Standard Hoisting Ropes
Semi-Pliable, Pliable and Extra Pliable Ropes
Improved Patented Cruicible Cast Steel Hoisting Ropes
Improved Mild Steel (Siemens-Martin) Elevator Ropes
Transmission and Colliery Ropes
Tiller Ropes
Galvanized Steel Hausers
Galvanized Strand 2, 3 and 7 wire for Guys
Ropes to any Standard Specification

Literature ready for distribution at an early date. Write for it

CANADA WIRE & CABLE CO.
LIMITED

Factory at
1170 Dundas Street
Toronto

HEAD OFFICE
KENT BUILDING, 156 YONGE STREET,
TORONTO

"Some Equipment With Merit"

FOR THE CONTRACTOR

"Kilbourne & Jacobs" Pressed Bowl Wheelscrapers

are the very best that can be purchased anywhere. They are the only perfect wheelscraper. The best, strongest and easiest working Scraper ever put on the market.

We carry a full stock of all sizes for immediate shipment

"Columbus" Scraper

"K & J" DRAG SCRAPERS

In all sizes

"Boss" Scraper

Our scrapers are the leading drag scrapers everywhere. All our scrapers are absolutely seamless throughout and are superior to any others upon the market.

We want your inquiry when in the market—Prompt shipment from stock

F. H. Hopkins & Co.

MONTREAL

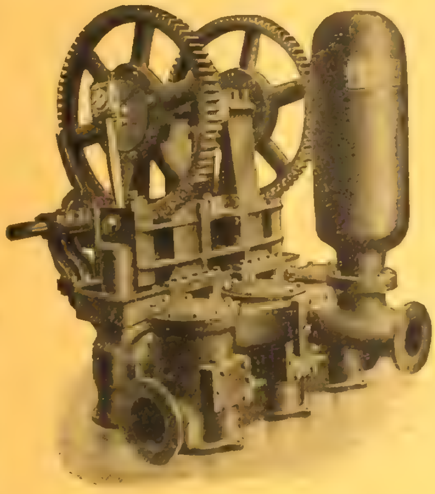
Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.

Vol. 25 Toronto, July 26, 1911 No. 30

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information



We manufacture Steam and Power Pumps, Condensers, Travelling Cranes, Etc.

Write for Catalogue

The Smart-Turner Machine Company Limited
HAMILTON, ONTARIO

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works : 91 to 133 Don Roadway
TORONTO

High Speed
Portable
COMPRESSORS
Page 28

Canadian RAND Co., Ltd.
Commercial Union Bldg., Montreal, Can.

Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS
for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

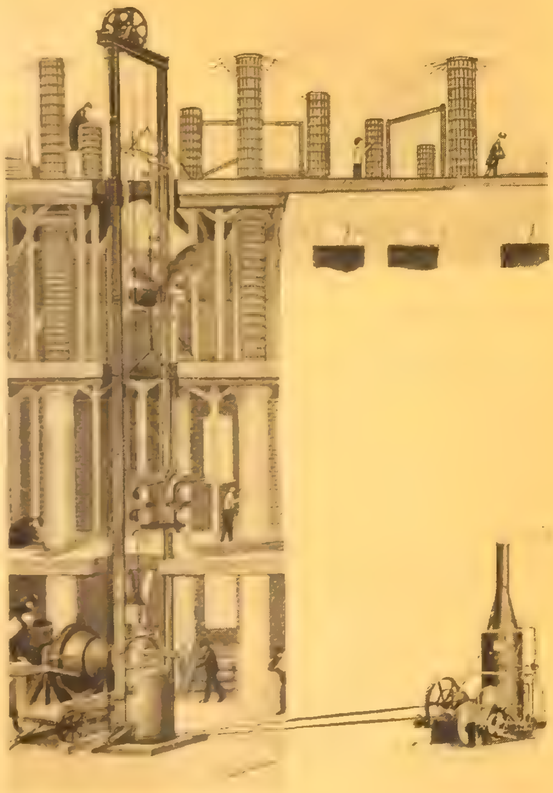
The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

---



THE "AMERICAN"

AUTOMATIC DUMPING CONCRETE BUCKET ELEVATOR

never fails to land the load where you want it. The automatic switch does the work, without any effort in manipulation.

The Best Thing of its Kind

The only short, quick, strong, safe way to handle concrete, brick, mortar, etc.

Write for Circular "C"

American Hoist & Derrick Co.

St. Paul, U. S. A.

Gorman, Clancey & Grindley
Edmonton, and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot. Ltd.
Vancouver, B.C.
J. L. Neilson & Co. Winnipeg, Man.
Dunn Brothers Winnipeg, Man.
J. A. McTaggert Winnipeg, Man.

Name __________
Address __________
Please send information and prices on "AMERICAN" Pile Driving Engines.
AMERICAN HOIST & DERRICK CO.
St. Paul, Minn.
C.R. 7/26/11

When making specifications keep these facts in mind about Canada Cement

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

Remember

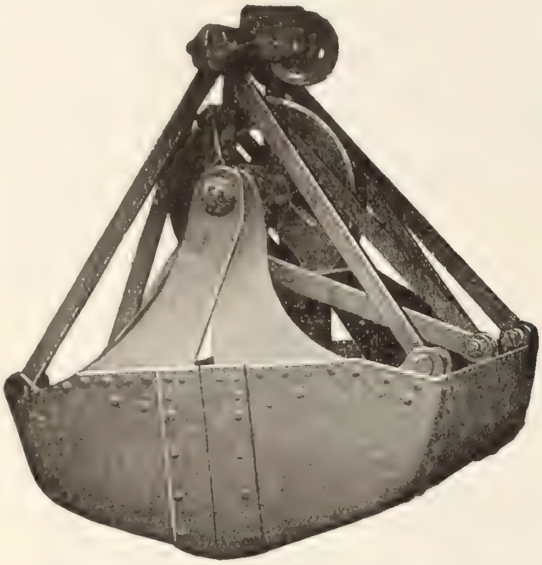
We guarantee **uniformity of strength, setting qualities, color,** and **fineness of grinding,** which must obtain if Concrete construction is to prove successful.

CANADA CEMENT COMPANY LIMITED
PORTLAND
CANADA
CEMENT
MONTREAL.

Canada Cement Company, Ltd.

MONTREAL - TORONTO - WINNIPEG - CALGARY

CLAM SHELL BUCKETS



Hayward Buckets

Have the reputation for
STRENGTH,
DURABILITY,
SPEED AND
ECONOMY

We have Buckets for all kinds of material.

Tell us your proposition and we will recommend the proper outfit.

CATALOGUE ON REQUEST

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

ORANGE PEEL BUCKETS

Hayward Orange Peels have Great Digging Power.

Multi - Power Buckets for Heavy Material.

SIZES

From 1 Cubic foot
To 3 Cubic yards

We Design Special Excavating Outfits.

Our Engineering Department is at your disposal to solve any special conditions.

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects — Page
[illegible]
Weeks, [illegible]

Architectural Iron Work
Canada Wire Goods Mfg. Co. 73
[illegible] Wire & Iron Works
[illegible]

Air Compressors
[illegible] Wyss & Co.

Air Valves, Automatic
Marsh, J. P.

Asphalt Plant
[illegible] Machine Co.

Buckets
American Hoist & Derrick Co. 2
Sackett Screen & Shute Co.

Belting
Federal Engineering & Supplies, Ltd 80

Blowers
Sturtevant Co., B. F. 71

Boilers
Inglis, John 65
Jenckes Machine Co. 2
Leonard & Sons, E 73
Marsh & Henthorn 69
McDougall Caledonian Iron Works 67
Mussens Limited 4
Waterous Engine Works Co. 77

Brick Machinery and Supplies
Berg Mfg. Co.
Wert C. S. 67
Whitehead, John

Brick
American Enamelled Brick Co.
Don Valley Brick Works 7
Hamilton Pressed Brick Co 17
Milton Pressed Brick Co
Port Credit Pressed Brick Co 86
Toronto Pressed Brick Co.

Brickmaker's Supplies
Sackett Screen & Shute Co.

Bridges (Steel)
Attica Bridge Co. 78
Canadian Bridge Co 84
Cleveland Bridge Co. 84
Des Moines Bridge and Iron Co. 71
Dickson Bridge Works
Dominion Bridge Co 84
Hunter Bridge and Boiler Works 79
Phoenix Bridge and Iron Works 85
Pennsylvania Steel Co. 84

Cement
Alsen Portland Cement Co 74
Britnell & Co 80
Bremner, Alex 87
Canada Cement Co 3
McNally & Co., W. 85
Morrison & Co., T.A. 88
Rogers, Alfred Limited 9

Concrete Pipe
Dominion Concrete Co. 22
Lock Joint Pipe Co.

Cement Waterproofing
Ceresit Waterproofing Co. 70
[illegible] 19
Hercules Waterproofing Cement Co 78
Mansbendel, F. P. 31

Cranes, Travelling & Locomotive — Page
American Hoist & Derrick Co. 2
Armstrong, H. J. 69
Brown Hoisting Machinery Co. 77
Males Co 62
Parker, S. E 20
Willis Shaw Machinery Co 62

Conduits
Conduits Co., Limited 87

Crushed Stone and Granite
Sand and Supplies 85

Concrete Mixers and Machinery
Canada Foundry Co. 20
Cropp Concrete Machinery Co. 80
General Machinery Co. 72
Gould, Shapley & Muir 92
Hopkins & Co., F., H 16
Ideal Concrete Machinery Co. 77
Jenckes Machine Co. 2
London Concrete Machinery Co. 35
Milwaukee Mixer Co. 16
Mussens Limited 4
Morrison & Co., T.A 88
Steel and Radiation (Cement Gun) 23
Standard Scale
Vining Bros.
Wettlaufer Bros. 10
Wert C. S. 67

Contractors' Plant
American Hoist & Derrick Co. 2
Acme Eqpt. & Engineering Co. 75
Beatty & Sons, M. 6
Hepburn, John T. 12
H. & E. Lifting Jack Co. 71
Hopkins & Co., F.H 92
International Marine Signal Co. 8
Willis Shaw Machinery Co 62
Meaford Wheelbarrow Co.
Marsh & Henthorn 69
Montreal Locomotive Works 32
Mussens Limited 4
Parker, S. E 20
Ritchie Contractors Supply Co. 76
Tiffin Wagon Co.
Troy Wagon Works 71
Watson Wagon Co 76
Wert C. S. 67

Crushers (Stone and Rock)
Berg Machinery Co.
Hopkins & Co., F. H. 92
Jenckes Machine Co 2
London Concrete Machinery Co. 33
Males Co 62
Mussens Limited 4
Morrison & Co., T. A 88
Willis Shaw Machinery Co 62

Corrugated Iron
Galt Art Metal Co.
Metallic Roofing Co. 69
Metal Shingle and Siding Co. 29
Ormsby, A. B., Limited 11
Roofers Supply Co 87

Contractors
Bennett, Robt. 69
Foundation Co 89
Holmes, Fred. 79
McIlwraith, Jas. A 81
Nadel & Adler 88
Wells & Gray

Coal Handling Apparatus
American Hoist & Derrick Co. 2
Down Draft Furnace Co. 75
Parker, S. E 20

Derricks and Derrick Fittings
American Hoist & Derrick Co. 2
Parker, S. E 20

Drills — Page
Beatty & Sons M 6
Canadian Rand Co 28

Drilling Contractors
Harvey, J. 83

Dredges
Beatty & Sons, M 6
Males Co. 62
Willis Shaw Machinery Co 62

Dry Kilns
Sturtevant Co., B. F. 71

Electrical Apparatus, Motors
Canada Ford Co.

Engines
Canadian Boving Co.
Inglis, John 65
Jenckes Machine Co. 2
Leonard & Sons, E 73
Mussens Limited 4
Sturtevant Co., B. F. 71
Waterous Engine Works Co. 77

Engineers (Civil) and Mechanical
Barber & Young 88
Chipman & Power 88
Bowman & Connor 88
Farmer, John T. 88
Fuce, Edw. O. 88
Galt Engineering Co., John 88
Glaubitz, H. J. 88
Hancock, H. Syd. 88
Inglis, John 65
Kennedy, Jas. C. 88
Lea & Ferguson 88
Mace, T. Harry 88
Mitchell, C. H. 88
McRae, John B. 88
Moore & Scollan 88
Taylor, James 88

Exhaust Heads
Sturtevant Co., B. F. 71

Filters
American Water Softener Co.

Floor Scrapers
Hurley Machine Co. 79

Friction Clutches
Berg Machinery Co.

Field Instruments
Gurley, W. & L. E. 68

Fire Brick
Gibb, Alexander 81

Fire Apparatus
Morrison & Co T. A. 88
Seagrave, W E. 80

Fireproof Doors and Windows
Douglas Bros. 18
Mussens Limited 4
Ormsby, A. B. 11
Steel and Radiation 23

Gauges, Steam, etc.
Marsh, Jas. P. 82

Granite and Marble
Laurentian Granite Co. 83
Missisquoi Marble Co. 81
Smith Marble & Construction Co.

Glass — Page
Consolidated Plate Glass Co.
Luxfer Prism Co.
Toronto Plate Glass Importing Co. 1

Hoists (Hand Gasoline and Electric)
Parker, S. E. 20

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. 73
Steel and Radiation 23

Hoisting Machinery
American Hoist & Derrick Co. 2
Beatty & Sons, M. 6
Canada Ford Co.
Inglis, John 65
Jenckes Machine Co. 2
Hopkins & Co., F. H 92
London Gas Power Co. 73
Marsh & Henthorn 69
Mussens Limited 4
Parker, S. E. 20
Sturtevant Co., B F. 71

High Pressure Pipe Lines
Escher Wyss & Co 29

Hydrants
Canada Iron Corporation 87
Gartshore-Thomson Pipe Co 86
Kerr Engine Co.

Interior Finish and Doors
Anglin, S. 74
Brennen & Sons, M 30
Batts Limited 14
Canada Office & School Furniture Co 24
DeLaplante, Ltd. 81
Bryan Mfg. Co. 67
Eaton & Sons, J. R. 81
Elmitt Lumber Co. 80
Georgian Bay Shook Mills 3[illegible]
Rhodes Curry & Co. 73
Wilson Bros.

Locomotives
Montreal Locomotive Works 32

Lime
Christie, Henderson & Co. 82
Jamieson Lime Co. 72
Standard White Lime Co 75

Metal Lath
Galt Art Metal
Metallic Roofing Co. 69
Noble C. W. 74
Steel and Radiation 23

Meters
Hopkins & Co., F. H. 92
McDougall Caledonian Iron Works 67
Neptune Meter Co 71

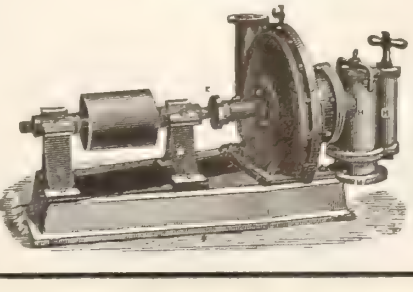
Paving and Paving Materials
Dominion Carbolineum Works
Metropolitan Paving Brick Co.
Ontario Asphalt Block Co. 74
Shawmut Paving Brick Co. 72
Silica Barytic Stone Co. of Ontario 83

(Continued on page 10)

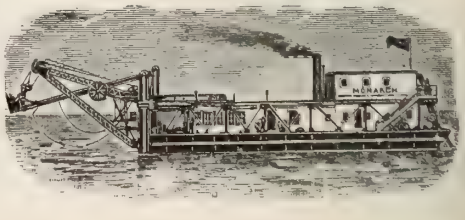
M. Beatty & Sons, Limited
Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: David McGill, 206 Merchants Bank Chambers

Engineers and Builders

OF ALL

Steel and Iron Structures

Mill Buildings our Specialty. Roofs, Bridges, Columns and Girders of Every Description. Large Stock of Structural Shapes always on hand for immediate shipment. Ask for Designs and Estimates on your Work.

International Marine Signal Company Limited
OTTAWA, CANADA

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster	Page
[illegible] Mfg. Co.	[illegible]
[illegible] & Co.	82
[illegible] H. W.	86

Portable Saw	
Canadian Fairbanks	[illegible]

Pipe	
American Spiral Pipe Works	75
Canadian Pipe Co.	86
Dominion Wood Pipe Co.	12
Dominion Concrete Co.	23
Gartshore Thomson Pipe Co.	86
Lock Joint Pipe Co.	
[illegible] & Co.	11
National Iron Works	87
Pacific Coast Pipe Co.	1
Pedlar People	
Steel Co. of Canada	19
Steel and Radiation	23

Plumbers' Supplies	
Standard Ideal Co.	34

Power Engines	
Inglis Co., John	65

Paints and Varnishes	
Paterson Mfg. Co.	90

Pile Driving Machinery	
American Hoist & Derrick Co.	2
Lincoln Construction Co.	80

Pumps and Pumping Machinery	
American Well Works	
Beatty & Sons, M.	6
Cook, A. D.	
Escher Wyss & Co.	29
Hopkins & Co., F. H.	92
Inglis Co., John	65
Leonard & Sons, E.	73
McDougall Caledonian Iron Works	67
Mussens Limited	4
Ontario Wind Engine & Pump Co.	72
Smart-Turner Machine Co.	1
Waterous Engine Works Co.	77

Roofing Materials	Page
Asbestos Mfg. Co.	24
Galt Art Metal Co.	
Metallic Roofing Co.	69
Metal Shingle & Siding Co.	29
Noble, Clarence W.	74
Paterson Mfg. Co.	90
Philip Carey Co.	71
Roofers Supply Co.	87
Standard Paint Co.	

Railway Supplies	
Gartshore, John J.	88
Hopkins & Co., F. H.	92
Mussens Limited	4

Reinforcements, Concrete and Steel	
Ambursen Hydraulic Construct'n Co.	89
Canada Wire Goods Mfg. Co.	70
Concrete Form Engine Co.	33
Steel Co. of Canada	19
Steel & Radiation	23
Trussed Concrete Steel Co.	73
Turner, C. A. P.	

Road Machinery	
Hamilton Machinery Co.	15
Morrison & Co., T. A.	88
Mussens Limited	4
Western Wheeled Scraper Co.	11

Shovels (Steam)	
Beatty & Sons, M.	6
Canada Foundry Co.	20
Hopkins & Co., F. H.	92
Montreal Locomotive Works	32
Mussens Limited	4
Males Co.	62
Willis Shaw Machinery Co.	62

Stone	
Anderson, Geo.	18
Britnell & Co.	82
Brodie, Jas.	
Christie, Henderson & Co.	82
Consolidated Stone Co.	
Contractors' Supply Co.	82
Corinthian Stone Co.	26
Crushed Stone, Limited	73
Doolittle & Wilcox	87
Hagersville Contracting Co.	11
Laurentian Granite Co.	83
McMillan & Son, R.	70
Morrison & Co., T. A.	88

Stone	Page
Myers, Oakley	73
Roman Stone Co.	13
Sackville Freestone Co.	8
Sand & Supplies	85
Thames Quarry Co.	80

Sand and Gravel	
Rogers Supply Co.	31
Sand & Supplies	85

Steam Apparatus	
Sturtevant Co., B. F.	71

Submarine Diver	
Rouleau, Joseph N.	88

Structural Iron and Steel	
Dominion Bridge Co.	84
Steel Co. of Canada	19
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	89
Salter, W. H.	85
Steel & Radiation	23

Sewer Pipe	
Britnell & Co.	82
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
Gartshore Thomson Pipe Co.	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	
National Iron Works	87
Ontario Sewer Pipe Co.	21
Standard Drain Pipe Co.	21

Slate	
Roofers Supply Co.	87

Steel Shingles and Ceilings	
Galt Art Metal Co.	

Smoke Stacks	
Leonard & Son, E.	73

Tents	
Woods Limited	25

Safes and Vaults	
Taylor, J. & J.	

Testing and Inspection Bureau	Page
Hunt & Co., Robt. W.	73

Tiles	
Smith Marble & Construction Co.	

Tanks and Stand Pipes	
Berg Machinery Co.	
Inglis, John	65
Jenckes Machine Co.	2
Leonard & Sons, E.	73
Marsh & Henthorn	69
McDougall Caledonian Iron Works	67
Ontario Wind Engine & Pump Co.	72

Trade Journals	
Castellanos A. W.	72

Valves	
Canada Iron Corporation	87
Gartshore-Thomson Pipe Co.	86
Kerr Engine Co.	
Marsh & Co., Jas.	82

Ventilating and Heating Apparatus	
Sturtevant Co., B. F.	71

Water Softeners and Filters	
Berg Machinery Co.	
American Water Softener	

Wire Rope	
Greening Wire Co., B.	
Smith, Thos. & Wm.	14
Steel Co. of Canada	19

Wire Guards and Screens	
Canada Wire Goods Mfg. Co.	73
Crescent Wire Iron Works	83
Greening Wire Co., B.	
Sackett Screen & Shute Co.	
Steel and Radiation	23

Water Wheels	
McDougall Caledonian Iron Works	67
Canadian Boving Co.	

Water Turbines	
Escher Wyss & Co.	29

Wheelbarrows	
Sackett Screen & Shute Co.	
Meadford Wheelbarrow Co.	
Parker, S. E.	20

ANY MIXER WILL MIX

But a "Wettlaufer Heart-Shaped Mixer" will mix a batch of concrete in less time than any other mixer on the market, and discharge it more quickly. It stands to reason that a firm who have done concrete work for many years should know how to make a good mixer. Power saving is another important feature of our mixers.

Write for our Catalogues

Wettlaufer Bros.
178 Spadina Ave.
TORONTO
A. R. Williams Machinery Co.,
15 Dock St., St. John, N. B.
W.E. Ransome, Moose Jaw, Sask.

MODERN.

STRONGER. CHEAPER.

→ ESTABLISHED 1861. ←

MUNDERLOH & CO. LD.

Sole Agents in CANADA for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS

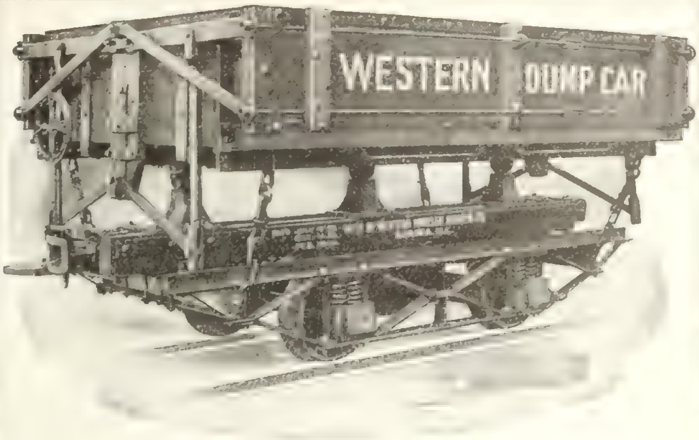
AN IMPROVEMENT ON CAST IRON MAINS.

MADE UP TO 40 FEET IN LENGTH.

51 VICTORIA SQUARE.

MONTREAL.

RELIABLE



THE

Proved Quality Dump Car

The unequaled **practical** experience back of Western Dump Cars combined with their **sturdy** construction and the fact that they have always led in improvement is the reason for their matchless reputation for **quality** and **efficiency**—they are as good as greatest skill can make them.

The Western Four Yard Car

is ideal size for 3-ft. gauge. It is unbeatable in design and construction—ample capacity for heavy loads, yet of low, compact form, with bed and truck separable, steep dumping angle and automatic pivoted side boards. It is dependable in **any** service.

Sizes and styles of Dump Cars for every purpose are described in our general catalog of earth and stone-handling machinery.

Western Wheeled Scraper Co.

AURORA, ILL.

WE TALK

Appearance and Finish

When we talk **Kalameined Clad Fireproof Doors** to you. They are really Fireproof but then some Fireproof Articles have not much appearance to them. These Doors are a really beautiful article, they do not bulge between the wood and the iron. Send us your details and let us quote you a figure.

A. B. Ormsby, Limited

Experts in Fireproof Windows and Doors

Factories: - - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

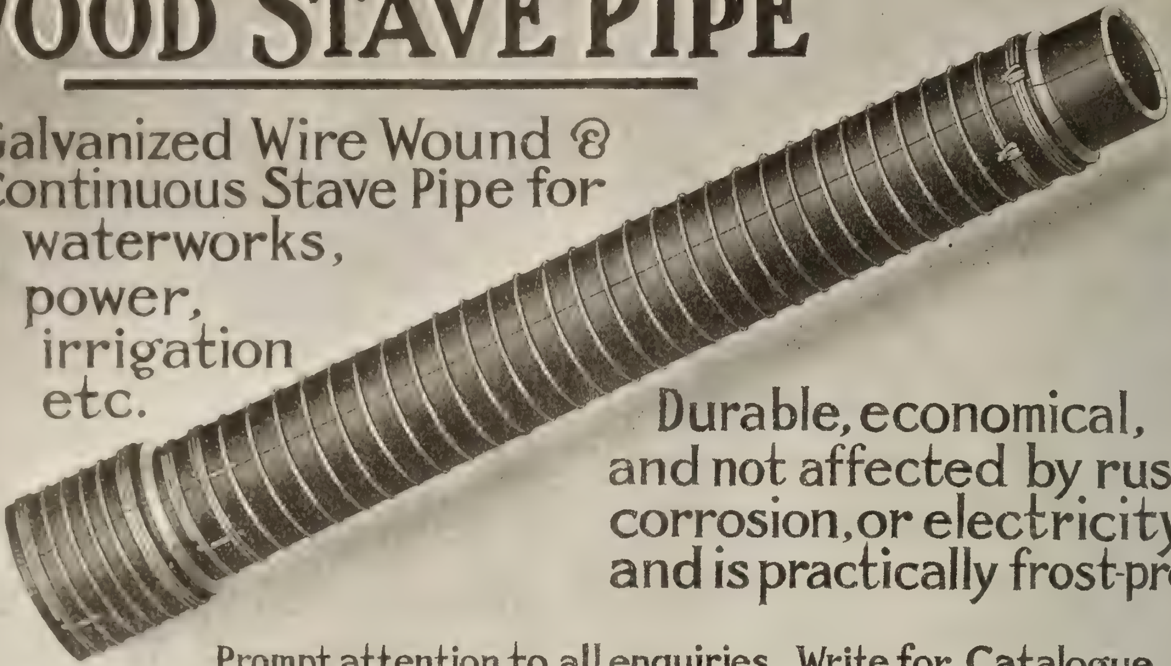
SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



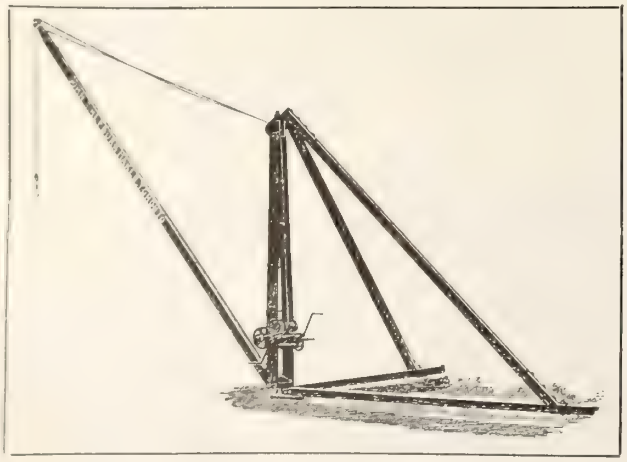
Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

A Saving of Time and Labour

Time is Money. Labour costs Money. Anything that means saving of Time and Money is well worth looking into.



Hepburn Scotch Derricks

effect a Labour Saving of fully 50 per cent. over the old style derrick—with greatly increased efficiency.

Increased efficiency and reduced operating cost, means more work and better work in less time and with less labour—means greater capacity—more business—larger margin of profit.

We make "Efficient" Derricks of all kinds and for all purposes.

Others use Hepburn Derricks because they find it pays to use the best. It will pay you too. Write to-day for particulars.

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company

Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

THOS. & WM. SMITH, LD.,
WIRE ROPE MANUFACTURERS,
NEWCASTLE-ON-TYNE, ENGLAND.

ELECTRIC CABLEWAY OVER THE ZAMBESI RIVER AT THE VICTORIA FALLS.
Span, 870 feet. Working Load, 10 tons. Main Cable 8½" circ. Breaking Stress of Main Cable, 275 tons.
Main Cable supplied by THOS. & WM. SMITH LTD., Newcastle-on-Tyne.

HIGH-CLASS WIRE ROPES
For CONTRACTORS' WORK, such as BLONDINS, CRANES, INCLINES, BALLAST ROPES,
&c., &c., and all classes of work requiring Wire Ropes.

AGENTS IN CANADA:
Evans, Coleman & Evans, Ltd., Vancouver.
Angel Engineering & Supply Co. Ltd., St. John's, N.F.
Baines and Peckover, Toronto.

REPRESENTATIVE FOR CANADA:
D. W. CLARK, P.O. Box 521 TORONTO, ONTARIO.

USE ONLY SMITH'S "RED THREAD" WIRE ROPES.

'Champion' Road Machinery

Leads all Others

Good design will never compensate for structural weakness.

Structural strength will never make a poorly designed machine good.

It is only when Road Machinery is **right in every respect** that it can be trusted to do all that is expected of it under all conditions.

"Champion" Road Machinery leads all others because it has no weaknesses to offset its invaluable, exclusive features.

"CHAMPION" Rock Crushers

"CHAMPION" Graders

"CHAMPION" Sprinklers and Sweepers, etc.

have born the champion reputation for over 20 years. Write for the catalog before you buy—tell us which machine interests you and we will give full information.

Save 3 to 5 days on Repair Parts

Order all repair parts direct of the Hamilton Machinery Co., 144 York St., Hamilton. By sending direct you will save from 3 to 5 days in shipment of your order.

Manufactured by

American Road Machine Co., of Canada, Limited

GODERICH, ONT.

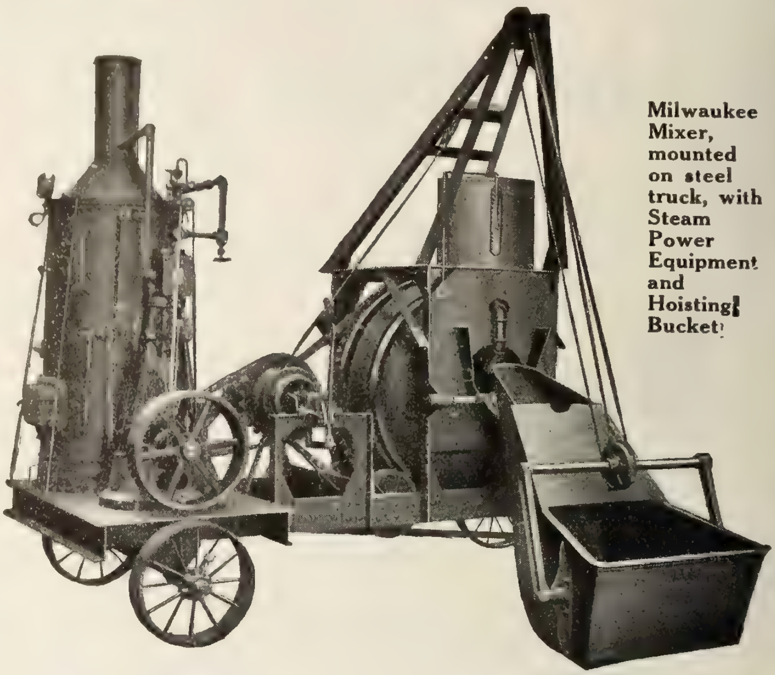
THE HAMILTON MACHINERY CO., LIMITED, HAMILTON, ONT.

Sole Agents for the Above Company

Also Canadian Distributors for the famous Inter State Automobile.

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES.
The Stuart Machinery Co., Winnipeg, Man. C. W. Stancliffe & Co., Vancouver, B. C.
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS

Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada

Hamilton Pressed Brick

New Collegiate Institute, Brantford, Ont. Chapman & McGiffen, Architects, Toronto

For Clean Brick-Work

This brick is free from so-called soda. After twenty years it will look as clean and fresh as the day it is delivered. Hamilton Pressed Bricks are uniform in size and color. The illustration shows a neat, clean cut job obtained with our brick. Specify **more** than "Brick" make it **"Hamilton Pressed Brick."**

Besides furnishing a high class product we can fill your orders promptly. Connections with T. H. & B., C. P. R., G. T. R., M. C. R

Hamilton Pressed Brick Company

Limited

Phones
Factory 1992
Office 2931
Residence 345

Spectator Building, Hamilton, Ont.

Toronto Representative, WALTER HUNTER 105 MacDONALD AVE.
Montreal, STINSON-REEB CO., Eastern Townships Bank Building.

Circular Diamond Saws

For Limestone, Marble and Sandstone

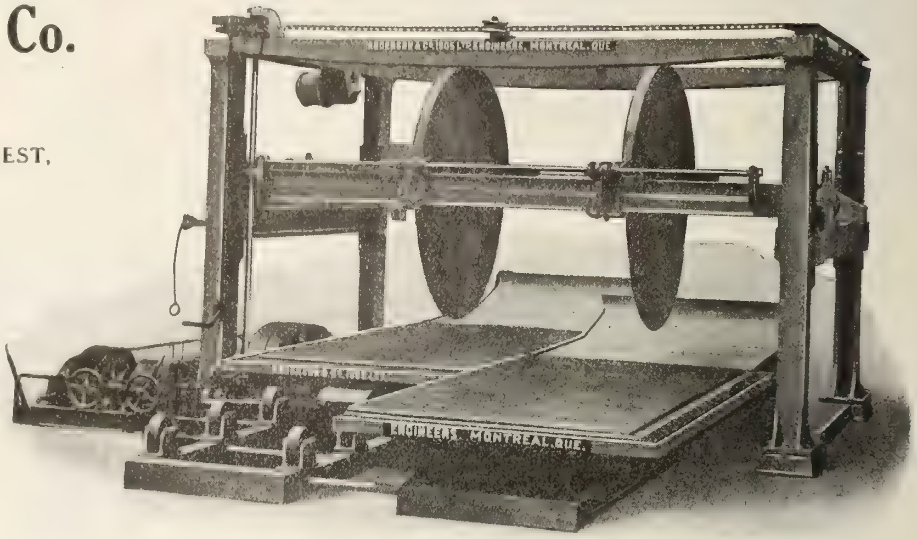
Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICES & WORKS

London, England, 82 Victoria St., S.W.
Newark, N.J., U.S.A. 420-422 Ogden St.
Montreal Works, 157 Craig St. West
Head Works, Carnoustie, Scotland

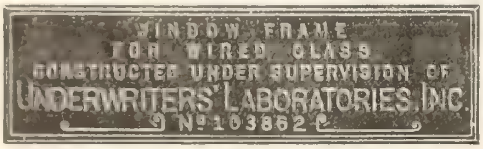
MAKERS OF

Gangs, Planers, Marble Dressers, Derricks, and Electric Traveling Cranes up to 50 tons, Quarry Machinery, Gas Engines and Producer Plants. 10 H. P. to 150 H. P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 SINGLE AND DOUBLE TABLES

About 50 of the above Machines at work in Canada


WINDOW FRAME
FOR WIRED GLASS
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES, INC.
Nº 103862

Underwriters' Label.

The Underwriter's Test

There is absolutely no question as to the comparative value of our Metal Fireproof Windows over the old-fashioned metal or metal-covered wood shutters. Repeated tests have proved conclusively the superiority of metal fireproof windows.

The ideal fireproof windows should be constructed to meet the following requirements:

It must be absolutely fireproof.

It must have hollow sheet metal frames and sash, fitted with wire glass.

It must be riveted and locked together so that it will not fall apart when exposed to intense heat, solder only being used to finish the seams and mitres.

The Douglas Window has stood the National Board of Fire Underwriters' test to which it has been subjected at their Laboratory at Chicago, and is endorsed by them.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

DO YOU USE

"R. I. W." No. 232?

(TOCH BROTHERS)

IT INSULATES AND RENDERS DAMP-PROOF ALL BRICK WALLS
HOLDS PLASTER TO BRICKWORK

SAVES COST OF FURRING AND LATHING **PREVENTS STAINING ON INTERIOR PLASTER**

USED SUCCESSFULLY ON

NEW PUBLIC LIBRARY PENNSYLVANIA TERMINAL SINGER BUILDING
METROPOLITAN LIFE BLDG. MT. SINAI HOSPITAL NEW U.S. CUSTOM HOUSE
ALL IN NEW YORK CITY

SEND FOR CIRCULARS AND INFORMATION

CANADIAN OFFICE AND FACTORY

THE R. I. W. DAMP RESISTING PAINT CO.

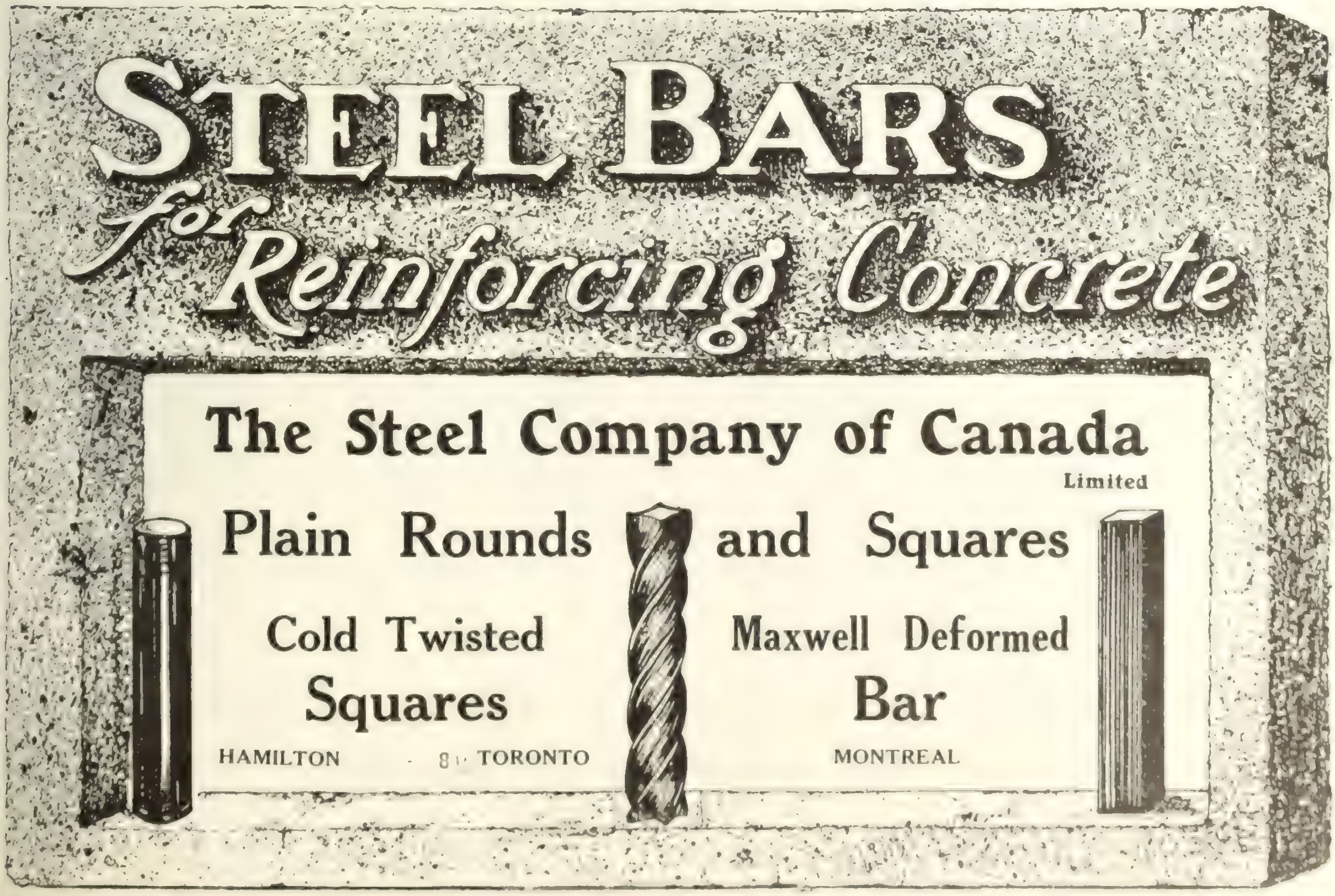
1372-1376 BATHURST STREET - TORONTO

CANADIAN DISTRIBUTERS:

CHILLAS BLACK, LIMITED
TORONTO

E. F. DARTNELL
MONTREAL

WM. N. O'NEIL & CO.
VANCOUVER



The Steel Company of Canada
Limited

Plain Rounds and Squares

Cold Twisted Squares

Maxwell Deformed Bar

HAMILTON - & TORONTO MONTREAL

J. H. NEW, President RYLAND H. NEW, Vice-Pres.

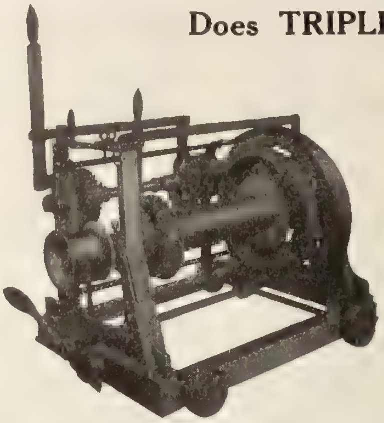
Hamilton Vitrified Salt Glazed Sewer Pipe

Known as the best for 50 years
The Quick Shippers

The HAMILTON & TORONTO SEWER PIPE CO., LIMITED
HAMILTON and TORONTO

LONG DISTANCE PHONES: Toronto, Main 990, College, 1558
Hamilton, 3990, 3991, 3432

The Parker Reversible Friction Hoist
Does TRIPLE Duty



Run with Gasoline Engine or Motor

No Experienced Operator Required

Drum, Elevator Sheave, Winch-head all operate independently of each other, and are each reversible. This hoist operates a derrick from the drum, a double cage material elevator from the sheave, and serves various other purposes from the winch-head—all on one job.

PAYS FOR ITSELF ON ONE ORDINARY JOB.

"I have used your No. 100 Reversible Hoist for over 5 years. It runs like a clock and has cost me nothing for repairs."
From an Experienced Contractor.

We also build derricks, steam and electric hoists in all sizes. Sole manufacturers of the PARKER PATENTED DERRICKS.

Write for information and prices.

S. E. PARKER, 1800-2 N. Francisco Ave., Chicago, Ill.

Selling Agents:
Gorman, Clancey & Grindley, Calgary and Edmonton, Alta.
J. L. Stuart Machinery Co., Winnipeg, Man.
A. G. Langley & Co., Vancouver, B.C.

Canadian Bucyrus Steam Shovels

Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: - Toronto, Ontario

District Offices:
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

Sewer and Culvert Pipes

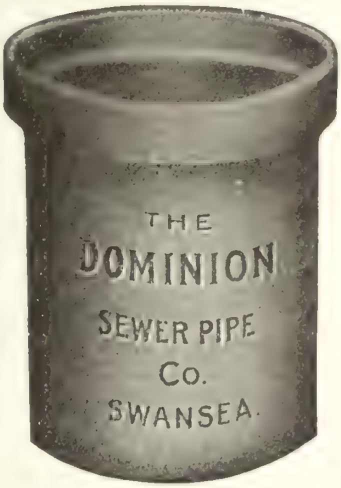
We manufacture Highly Glazed and perfectly Vitrified "Standard" and "Double Strength" Sewer Pipes and make a specialty of Double Strength Pipes for Railway Culverts.

We also manufacture Smoke Jacks, Inverts, Wall Coping, Flue Linings (square and round), Chimney Tops, Hollow Building Blocks and all kinds of Vitrified goods.

Fire Clay Goods, Stove and Range Bricks, Boiler Tube Bricks, Locomotive Blocks, and all kinds of "Special Shapes."

The
Standard Drain Pipe Co.
of St. Johns, P. Q., Limited
Factories at
St. John, P. Q. and New Glasgow, N. S.

SWANSEA
Salt Glazed and Vitrified
SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

Telephone (Toronto Connection)
Park 1809

The Dominion Sewer Pipe Co.
(The Independent Co.) Limited
SWANSEA (near Toronto)

The Pipe of the Hour — Mimico Brand

MIMICO PIPE IS RIGHT

ROUND PIPE and SQUARE DEALINGS

It is not Gas Pipe nor Steam Pipe, it is
SEWER PIPE

MEN who know have
Intimated to us
Many times that
It pays to buy "Mimico." The
Cost is little or no more than
Other makes.

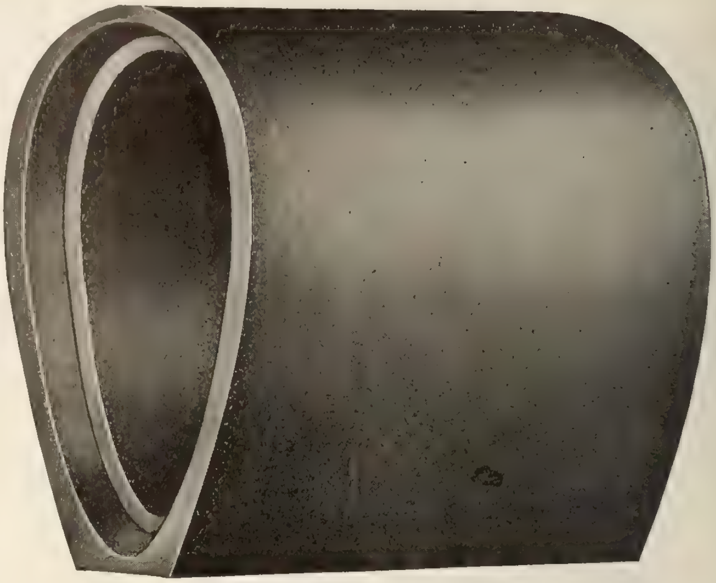
Perhaps you are
Interested in
Proposed contracts. Ask the
Engineers about it.

The ONTARIO SEWER PIPE COMPANY, Limited
MIMICO, ONTARIO
Telephones, Toronto Connection, Park 422; Evenings, Park 3888 and 3889

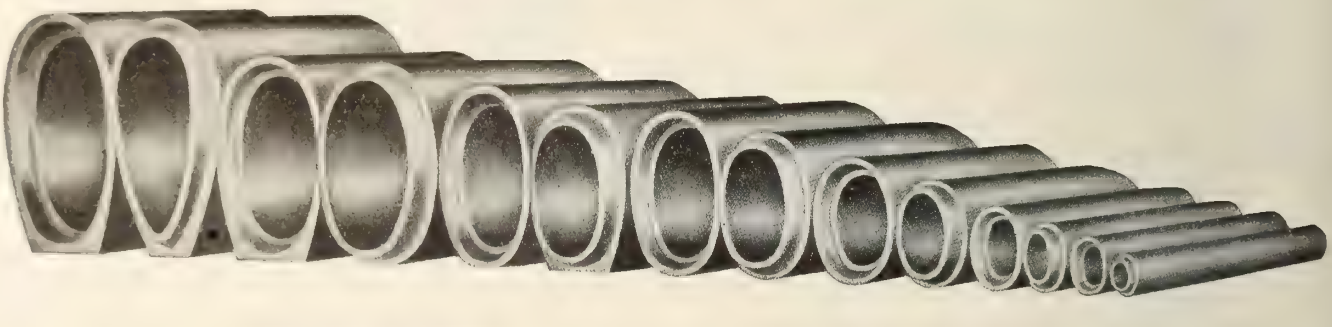
Municipal Engineers and Contractors

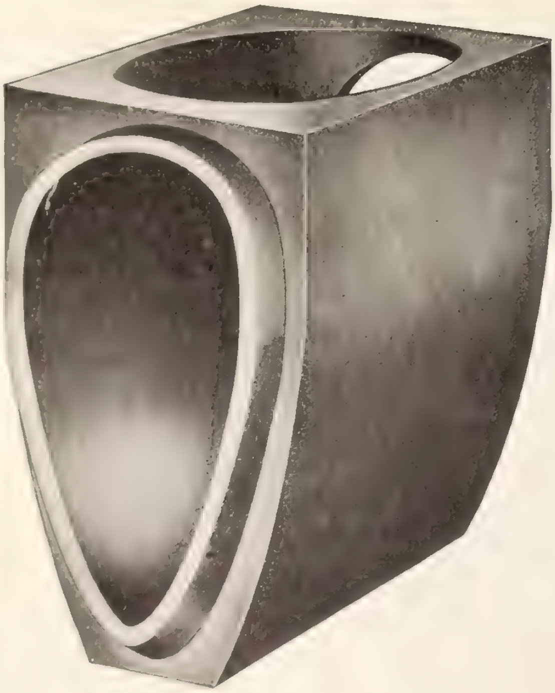
For **sewers** the only everlasting pipe is **concrete.** Builders do not use brick in foundations. Why? Because of the moisture. They do use concrete. Why? Because it is a proof against the destructive tendency of moisture. Why continue to use brick for sewers when a better material is now available at as low a cost?

In **Duluth** brick sewers failed after seven years so as to require replacement. **Concrete** sewers put in at the same time are **intact.** In **Milwaukee** after 25 years concrete pipe was found better than when new. Of 300 miles of sewers in **Milwaukee** over 200 miles are of **concrete.**



Section of 2' x 3' pipe





Man-hole Section of 2' x 3' pipe

Concrete sewers abound in **England** and **Germany**. The modern **sewers** of **Paris** are all of **concrete**. American cities have adopted it. **Brooklyn** has hundreds of miles of it with not a single failure, whereas even Scotch vitrified pipe has been found to have deplorably failed there. **Toronto,** after much hesitation, is now in line with concrete. Why be the last to join the ranks you eventually will and must join?

Our circular and egg-shaped sewer pipe are unsurpassed in quality, are more easily laid than flanged pipe, and give no trouble or ridiculous expense over man-holes or connections.

We have replaced vitrified pipe with concrete pipe and have found over 50 per cent of the vitrified unfit for re-laying. We carry a large and mature stock, we guarantee the quality, we take care of breakage in transit, and we solicit your patronage.

WRITE FOR CATALOGUE PRICE

Dominion Concrete Co., Limited

KEMPTVILLE, ONTARIO

Placing EXPANDED METAL in one of Toronto's newest and most modern fire-proof factories—the new 14-storey building of The T. Eaton Co., Ltd.

Why EXPANDED METAL Remains the World's Standard Reinforcement

xpanded Metal reinforces a concrete slab in **all directions,** ithout wiring or cross-bonding.

xpanded Metal with its rough, twisted strands, diamond eshes and stronger-than-welded joints, furnishes a **bond** or **nchorage** theoretically and practically perfect.

xpanded Metal strands are **flat** and **straight,** not wavy and inding—hence no "straightening out" ensues when form- ork is removed.

Expanded Metal—unlike rods—when once placed is not easily disarranged. The position computed for it by the engineer is assumed and kept.

Expanded Metal is not only **cheaper** and **simpler to use** than any other reinforcement, but, taken point for point, incomparably more efficient. Do not fail to consult us about your reinforced-concrete problems.

arge, illustrated Catalogue explaning the "STEELCRETE" System just off the press. You should have a copy

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE—FRASER AVENUE

MONTREAL
138 CRAIG STREET WEST

St. John—13 Germain St.
Quebec—153 St. Paul St.
Ottawa—83 Banks St.
Regina—Black Block

Fort William—113 N. May St.
Winnipeg—334 Garry St.
Calgary—309 8th Avenue.
Vancouver—416 Pacific Bldg.

The Wise Man

puts a roof of "Asbestos Shingles" on his building and his work is fireproof waterproof and immune to the effects of time and erasion.

The man who uses inferior materials puts on a good many roofs and then does not get satisfaction.

Asbestos Shingles

are not an experiment but a practical well tested roofing that has never failed to "make good."

The fireproof quality of Asbestos Cement Slate a thoroughly fireproof material, which, owing to its strictly scientific manufacture, cannot become either cracked, rent or scaled in case of fire.

SPECIFY

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P.Q.
Factory at Lachine, P.Q.

TENTS
for Engineers and Contractors

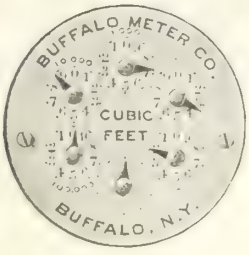
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

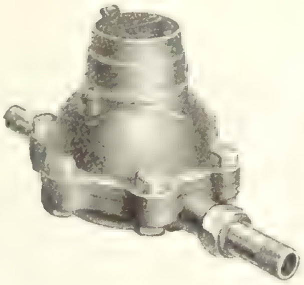
Woods Limited
Woods Building - Ottawa, Ont.

AMERICAN AND NEW NIAGARA
WATER METERS



Standard Dial

Straight Reading Dial



Jewel Bearing
Intermediate Gears
Self Cleaning and Sanitary
Adjustment for Pressure
Extra Thick, Strong Disc
Accuracy Guaranteed
Fewest Parts

BUFFALO METER CO.
290 TERRACE, BUFFALO, N.Y.

The United States Steel Corporation, at Gary, Ind.;
Stone & Webster Engineering Corporation, Minneapolis, Minn.;
A. Monsted Co., Milwaukee, Wis.;
Geo. B. Swift Co., 903 Security Bldg., Chicago.;
Pacific Coast Condensed Milk Co., Seattle, Wash.;
Sheffield Farms-Slawson Decker Co. Amenia, N.Y.; and
Inland Steel Co., Indiana, Ind.,
are among the largest users of concrete in the United States. They and many others, are using

REICHERT METAL FORMS

And saving from 3 to 7 cents per square foot.

Why do YOU stick to the old methods and let this additional profit slip away from you?

Building a big factory building with Reichert Metal Forms. Pacific Coast Condensed Milk Company's plant at Berlin, Wis. Stone & Webster Engineering Corporation, builders.

REICHERT MFG. CO.
MILWAUKEE, WISC., U.S.A.

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street
New York City

Corinthian Stone

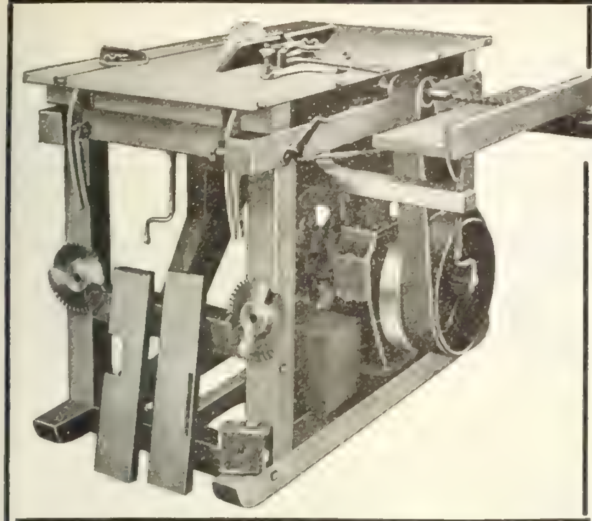
is extensively used for Churches, Schools and Colleges. In trimmings for brick or stone work, it is without an equal. Special prices for any work where a large quantity of repetition occurs.

St. Jerome College, Berlin, Ontario.

A large quantity of Corinthian Stone was used in building this well-known College. Estimates given for all classes of work. Send plans or write to :: :: :: : ::

The Corinthian Stone Co.

OFFICE AND WORKS:
G. T. R. JUNCTION, GUELPH, ONTARIO



On Every Concrete Job

You can save 10 to 15 per cent by using our Contractor's Portable Saw and Variety Woodworker.

Now is the time when you are starting to do your concrete work and this saw will be just what you are looking for—a cheap practical saw that will prove itself a time saver and money maker for you.

CONTRACTORS SUPPLIES OF ALL KINDS

The

Canadian Fairbanks Co., Limited

Fairbanks-Morse Gas Engines, Fairbanks Scales. Safes and Vaults.

Montreal Winnipeg Toronto Vancouver
St. John, N.B. Calgary Saskatoon Ottawa

WHAT IT IS

A Rip Saw
A Matcher
A Mitre Saw
A Cut-Off Saw
A Dado Machine
A Jointer
A Boring Machine
A Gaining Machine
A Grooving Machine
A Babbitting Machine
A Moulder with Self-Contained Power

FILE YOUR PLANS

Free of charge at any of the four offices of the

"CONTRACT RECORD"

Contractors and manufacturers of building, municipal, railway, and power plant equipment not only expect to see your tenders advertised in the "Tenders' Department" of the "Contract Record," but they will also find it a great convenience if you place your plans and specifications on file at any or all of our four offiices, viz. Toronto, Montreal, Winnipeg and Vancouver.

Send along your next Tender Advt. together with Plans and Specifications

CONTRACT RECORD

220 King St. West, TORONTO

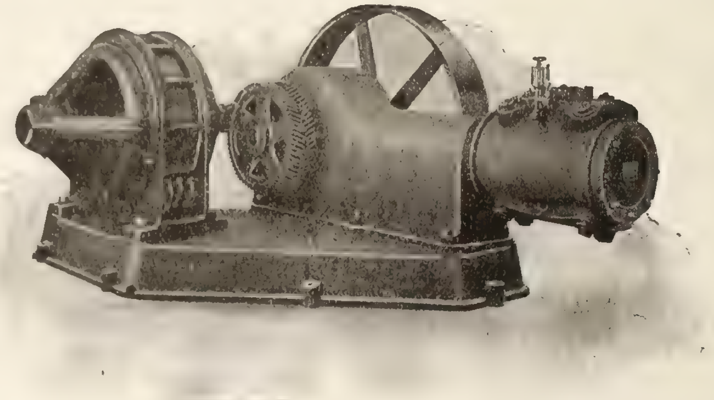
MONTREAL
Board of Trade Building

WINNIPEG
Travellers Building

VANCOUVER
Crowe & Wilson Chambers

Portable, Gear Driven

COMPRESSORS



Rand Class "NE—1" Straight Line Compressor mounted on a rigid sub-base and geared direct to an Electric Motor. A high speed, simple and perfectly automatic machine particularly adapted to contracting duties, where electric power is available.

The gear driven Class **"NE-1"** Compressor is a simple, reliable design in which automatic operation is combined with great power economy. This type permits of the advantage of direct electric drive at a very moderate first cost.

It is a well known fact that power economy is best effected by generation from a central plant.

Why not take advantage of this direct electric drive and economize on your power consumption, instead of generating your own power by small expensive boiler units.

Class "NE-1" Compressors are built in standard capacities of 50 to 300 feet free air per minute. Pamphlet K-92.

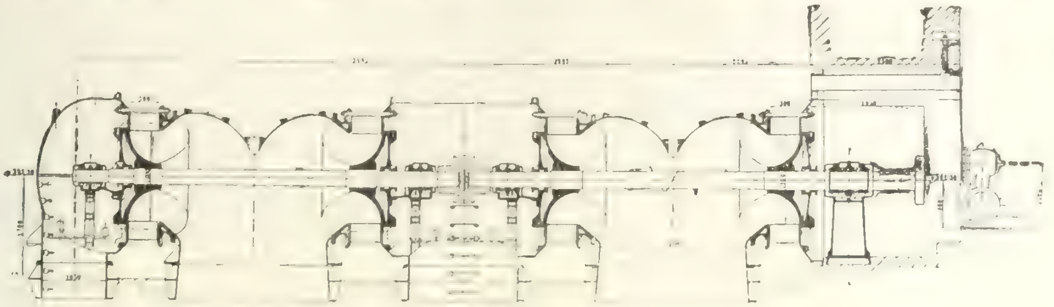
PNEUMATIC TOOLS ROCK DRILLS

CANADIAN RAND CO., LIMITED

Commercial Union Building, MONTREAL, CAN.
Toronto, Cobalt, Winnipeg, Lethbridge, Rossland, Vancouver, Halifax
South Porcupine Spokane Sydney

WATER - POWER PLANTS
LOW PRESSURE TURBINES

Any Output. 5,000 Turbines Supplied. 2,000,000 Horse Power.



26 ft. Head. 5,000 H. P.
Four Units as illustration on order for the German-Swiss Water Power Company

ESCHER WYSS & CO. - ZURICH, SWITZERLAND
CANADIAN HEAD OFFICE, 408 LUMSDEN BUILDING, TORONTO
PHONE, ADELAIDE 234

There is just one excuse for plaster ceilings:——

Only people not familiar with the multiple merits of Preston Steel Ceilings would permit a plaster ceiling to be placed in any house or store they are building. You, as a builder or contractor or architect, should see to it that your customers are made acquainted with the only modern, sanitary, fire-proof, damp-proof and PERMANENT ceiling. Let us prove its excellence to you, and you can then assert it to your customers.

Any property will rent or sell quicker when the ceilings are Preston Steel Ceilings. For these can be decorated beautifully as soon as installed—and the beauty endures. They need no repairs, for they will outlast the building itself. Yet their first cost—which is the FINAL cost—is remarkably little. Your profit is bigger, and the buyer of the property will be better satisfied. On rebuilding jobs, they can readily be used over old plaster.

Preston Steel Ceilings Cost Less Suit Best

Send for big illustrated pattern book, showing a few of the many styles we offer at lowest prices. Let us send you Price List.

Over 1,100 DESIGNS

Ask for the book

The Metal Shingle & Siding Co.
Limited
Preston, Ontario
Branch Office and Factory - MONTREAL

C. P. R. Freight Car Repair Shop, West Toronto

We completed this job in 2 months

WELLS & GRAY, Limited, Engineers and Contractors, **Toronto**

Doors

Midland Brand

That cannot Warp, Sag, or Crack

Our Doors are made from select material and by expert workmen. Modern facilities and careful attention to details enable us to satisfy you in price and quality.

Let your next order come to us.

Georgian Bay Shook Mills, Limited

MIDLAND, ONTARIO

Tel. Main 4155

We are now in the

Sand Business

Our Wagons hold 2½ Yards

High Grade Sand and Prompt Delivery

Rogers Supply Co.

28 King St. West,

Toronto

KITON is nothing else but **TAR**

which through a Patented Process is made

Soluble in Water

This solubility however is lost, the moment KITON becomes dry for the first time, that is, after evaporation of the water with which it is mixed. From that instant on, KITON can never be re-dissolved in or washed off by water. It is **impervious** and **weatherproof.**

just like tar

BECAUSE it can be applied as easily as ordinary paint,

" it can be coloured if desired,

" it is so economical and yielding,

" it is instantly ready when you want it,

KITON is the cheapest and most reliable surface coating for material subjected to the deteriorating action of weather and atmosphere.

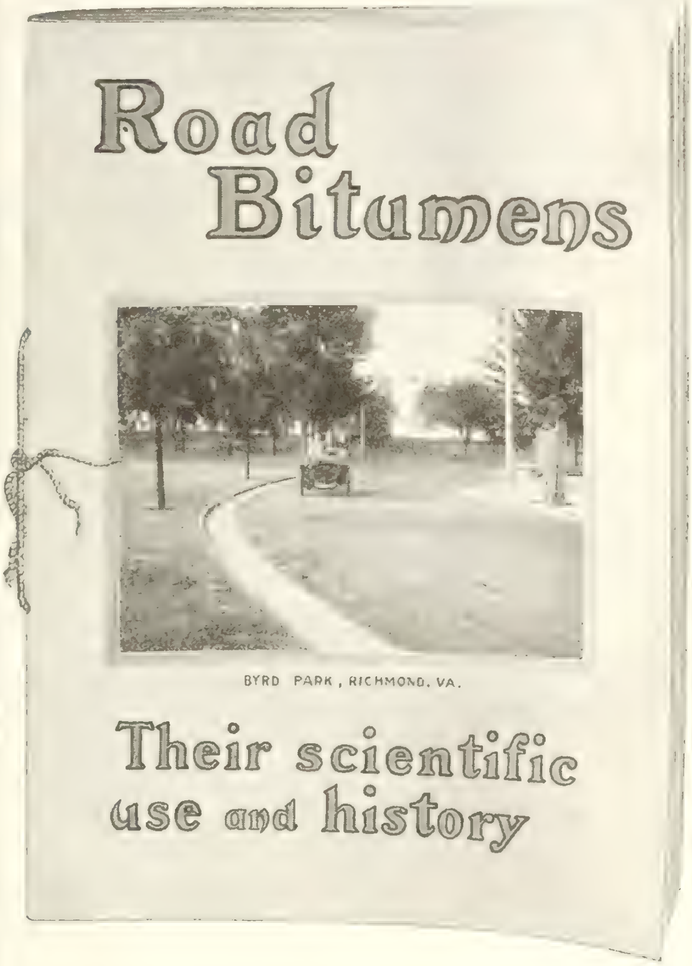
ASK FOR BOOKLET, SAMPLE AND PRICES

ATTRACTIVE PROPOSITION FOR DEALERS

F. P. Mansbendel

General Distributor for Canada

212 Huron St., - Toronto, Ont.



Road Bitumens

BYRD PARK, RICHMOND, VA.

Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a pamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

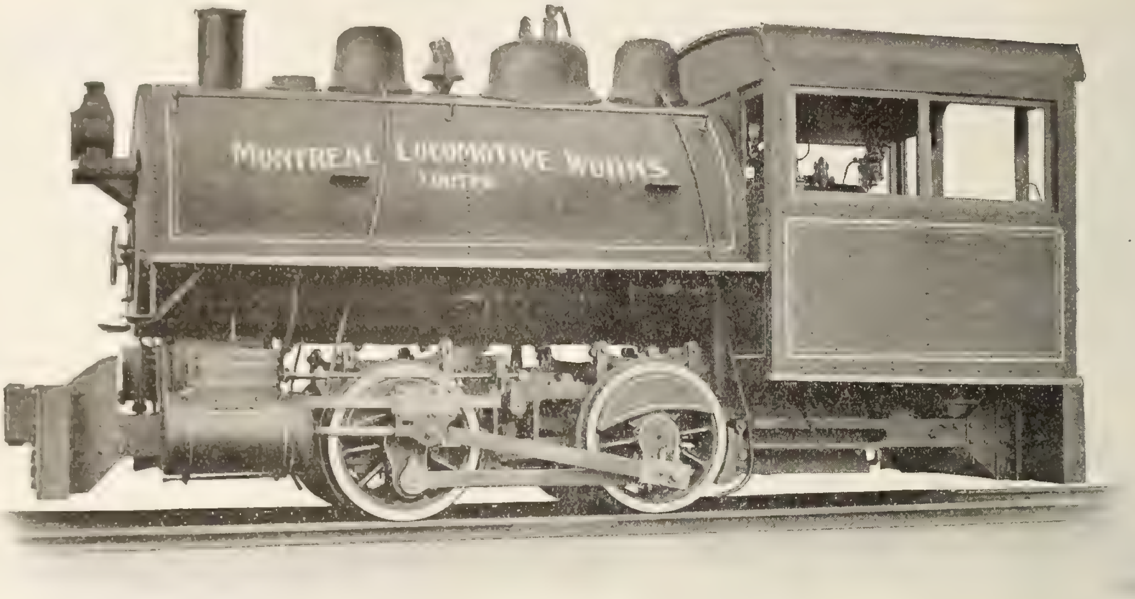
Send for the Book

Good Roads Improvement Company

First National Bank Building

CINCINNATI

CONTRACTORS LOCOMOTIVES



ONLY ONE QUALITY

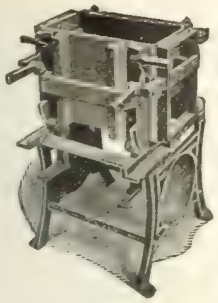
Montreal Locomotive Works, Limited, standard contractors locomotives are designed by engineers who have made a life study of the special conditions of contractors service and know what is needed to meet these conditions.

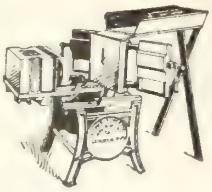
Their large boilers insure free steaming and ability to handle the load for which they are rated. Every piece of material entering into their construction must conform to the same specifications required for 200-ton locomotives. Only the best materials are used.

Contractors locomotives must frequently be operated long distances from repair shops, therefore simplicity and facility for repairs are vitally necessary. This was considered in designing this type of locomotive.

Every part is made in jigs or to gauges, and every part is sure to fit. Stocks are always available at our Works at Longue Pointe, Montreal, Canada.

MONTREAL LOCOMOTIVE WORKS, LIMITED
OTTAWA BANK BUILDINGS, MONTREAL, CANADA





London

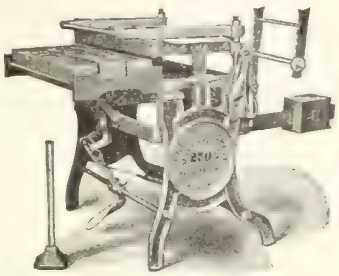
Face-Down Adjustable

Concrete Block Machine

makes every kind, size and design of block. **All sizes of blocks made** in the **one adjustable mould. All sizes of blocks made** on the **one size pallet.**

Any size core desired can be used which is withdrawn vertically and thus allowing all blocks to be made by the wet process, or with crushed stone in the block. Machine fully **covered by patents.**

SEND FOR CATALOGUE.



London Cement Pressed Brick Machine

Hundreds in operation. Needs no recommend from us. The brick **have frog impression.** The only machine which makes a brick **polished on every side.** Our **self-racking pallet** does away with racks for curing which makes it possible for the contractor to manufacture the **brick on the ground** where the building is to be erected. One man operating makes 5000 brick per day.

Our catalogue tells all about it.

The London Adjustable Sill, Step and Window Cap Mould

Every Contractor and Manufacturer of Cement Products should know the class of goods that can be produced on this mold **Can you afford to be without one ?** Write for catalogue and learn what this mold will do.

We also manufacture London Standard Drum Batch Mixers in five sizes, London Automatic Batch Concrete Mixers in two sizes, Cement Brick Machines, Face-Down Block Machines Power Drain Tile Machines, Hand Drain Tile Machines, Silo Curbs, Sewer Pipe Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

We are the Largest Manufacturers of Concrete Machinery in Canada

London Concrete Machinery, Co., Ltd.

19 Marmora Street, London Canada

Branches

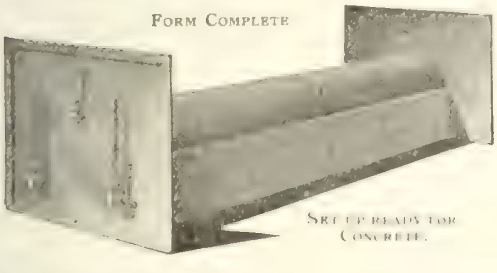
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
Hamilton Machinery Co., 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.
Foss & Hill Machinery Co., 329 St. James St., Montreal.

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.

FORM COMPLETE



SET UP READY FOR CONCRETE.

Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

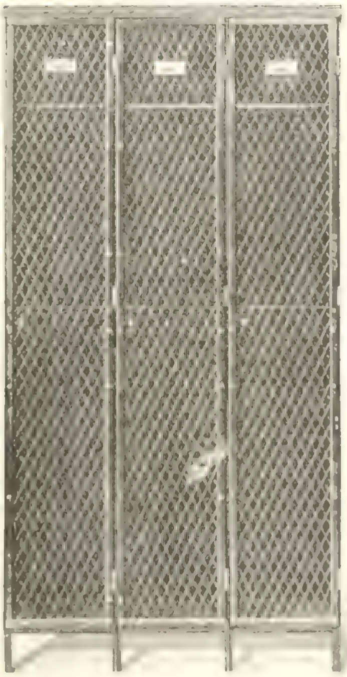
WRITE FOR FORM CATALOGUE
ENGINE CATALOGUE FOR THE ASKING
COMMISSIONER'S TIME BOOK FREE

Concrete Form & Engine Co.

Successor to Collapsible Steel Form Co.

83 Congress St. W., Detroit, Mich.

The Up-to-Date Building



Should be equipped with metal lockers for the safe and sanitary keeping of clothing.

If you appreciate good value and rigid construction in a locker, you will use MEADOWS' METAL LOCKERS on your next contract.

Send for our interesting booklet entitled

"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co., Limited

TORONTO, CANADA

EADIE-DOUGLAS LIMITED

HEAD OFFICE: 12-14 University Street, MONTREAL

Building and Mechanical Supplies and Specialties

BRANCH OFFICES:
TORONTO, - - 65 Victoria Street
WINNIPEG, - - 445 Main Street
OTTAWA, - - 198 Queen Street

REPRESENTING

Leeds Fireclay Company

Burmantofts Architectural Terra Cotta and Enameled Brick. Used by leading Architects and in representative buildings throughout Canada.

"Keystone" Fireproofing Company

Keystone Gypsum Partition Blocks and Furring. Fireproof, Soundproof, better and cheaper than Terra Cotta.

"Esco" Steel Coating and Preservo

A Waterproofing preservative paint for steel, wood and concrete. The solution of all paint difficulties. **PRESERVO—A preservative and waterproofing** for canvas.

"Terrano" Flooring Co'y of Canada, Limited

Terrano Jointless, sanitary flooring. Laid throughout the world, in hospitals, schools, hotels, private houses, power plants, factories, warehouses, etc.

Alphons Custodis Chimney Construction Co.

Custodis Radial Brick and Concrete Chimneys. Are in service in the largest plants in Canada and are lasting monuments to good judgement and business enterprise.

Edward Darby and Sons Company

"Pen Dar" Metal Lockers are the standard throughout Canada. The strongest and best constructed metal lockers, in all different styles and prices.

Mellows & Company Limited

Eclipse Lead Covered Clazing Bars for skylight Construction. Last a lifetime without any painting or repairing. MELLOWS STEEL SASHES AND CASEMENTS.

"Insulyte" Company Limited

A complete organization for the selling and installing all classes of insulating material.

B. F. Sturtevant Company
(Eastern Canada Only)

Sturtevant Electric Vacuum Cleaners, simple, effiicient and lasting. Ventilating and Heating apparatus, engines, motors, etc.

Send for catalogues and descriptive matter on any of the above lines that you are interested in.

THE
STANDARD IDEAL
COMPANY LIMITED
GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

Plate F332

Contented Customers are the Best Asset to Any Business

YOUR customers will be contented if you supply them with STANDARD IDEAL slop sinks and other fixtures.

They are unsurpassed for
QUALITY
FINISH
DURABILITY

BRANCH OFFICES AND SHOW ROOMS
TORONTO
119 KING STREET EAST
MONTREAL
44 BEAVER HALL HILL
WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1888
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 July 26, 1911 No. 30

Building and Business

For the first six months of 1911 ending June 30th the reports of building operations from various centres, published elsewhere in this issue, indicate pronounced activity in all branches. In several localities a scarcity of material and labor disturbances hampered progress, but their effect was insignificant considering the report as a whole, and confidence is expressed even in the most conservative circles that the year 1911 will show a great advance in all the provinces, over previous years. The market reports show building materials to be fairly steady, although shortages in several instances have occasioned slight disfavor and momentary increase in prices. Brick, tiling, crushed stone, and other building materials are apparently moving with great freedom.

Looking beyond the limits of the building industry, much has recently developed to give business men in general encouragement in forecasting conditions for the last half of the year. From the west comes the report that agricultural interests are in most promising shape. The acreage under cultivation is much in excess of that of previous years, so that even though deterioration has been or may be experienced in some localities owing to the destructive heat wave, the total for the country should be more than satisfactory. The great basis of the prosperity of Canada seems to be well established. The railway developments throughout the Dominion suggest that the various companies are cognizant of impending enormous traffic in the transportation of agricultural products, while the farmers may be relied upon for a retention of the splendid purchasing power which has made them such excellent customers for all kinds of manufacturers of merchandise.

That the country is steadily developing into better financial shape is shown by the very satisfactory condition of our foreign trade. Our financial interests are in better shape than ever, to handle the marketing of the season's harvest, and furnish the necessary funds for the expansion in business which is expected to come. Several of our leading banks have quite recently increased their capital. Such procedure would indicate that they are at last beginning to measure up to the demand of the country for fresh banking capital, and that a large amount of this increase will be available for the requirements of industrial development this autumn.

The Railway Factor

A glance at the building statistics issued monthly during the last few years exhibits enormous development in the centres of western Canada. This may be attributed to Canadian zeal and enterprise, to the foresight of foreign capitalists, or to a score of similar sources. For this development, however, we cannot fail to pay a considerable amount of tribute to the railways of the Dominion. To them is due likewise the recent opening up of the north and also the older development of upper and lower Canada, themselves. From history we learn that 70 years ago the first railway in the Dominion, a line 16 miles in length, in the province of Quebec, was opened for traffic. Twenty-five years ago the first transcontinental train over the Canadian Pacific started from Montreal to Vancouver. In the intervening time Canada made very slow progress by comparison with the leaps and bounds of more recent years. This was due to the general impression that the country was as unproductive as it was frozen. The west was a desert, down to its absorption into Confederation, and the old fur traders declared it would never be anything else. We are told the Canadian Pacific was undertaken about this time with the object of preventing the newer Canada from Lake Superior to the Pacific coast from crystallizing into an American possession. Few persons had any great amount of confidence as to its future. It had to traverse huge tracts of doubtful country before reaching the prairies and the results expected from further progress toward the mountains seemed unsubstantiated. Twenty-five years ago the original securities of the Canadian Pacific Railway were selling at fifty cents per share, whereas at the present time they are selling for over $2.40.

The Grand Trunk Pacific and Canadian Northern are following its example, and the results to be expected from the three transcontinental lines during the next twenty-five years, with due consideration for increased capital, increased credit, increased population, and increased enthusiasm, cannot be measured even with the pace set in the last twenty-five years.

The Gasoline Danger

Modern conditions are constantly calling for new legislation and regulations in connection with public utilities and many of the conveniences and necessaries of daily life. A new illustration of this fact has just been brought to notice in Montreal in connection with fire insurance, says our Montreal correspondent. The popularity and constantly increasing use of the automobile necessitates the storage of gasoline in many places where it was formerly never seen, and considerable quantities of this useful but dangerous commodity are to be found sometimes in little suspected quarters, as well as in public garages, where naturally it will be stored for use.

Permits for storage of gasoline in large quantities, such as for garages, are issued under the authority of the city council, but no complete separate list of these permits is kept at the City Hall. It will at once be seen that it would be very difficult for anyone to find out who has gasoline stored on their premises, and the more one thinks of this condition of affairs the more serious it appears to be. It is conceded by underwriters that any gasoline storage is liable to become a serious menace to the safety of neighboring property, if not, indeed, to the lives of residents in any locality. It is quite true that storage tanks are provided that are guaranteed to be perfectly safe, and these are made compulsory where large quantities of the volatile fluid are kept, but there are small quantities kept in many places where the protection is nil or next to useless.

A fire occurred the other day in which an incident occurred which is looked upon almost in the light of a precedent. This was at St. Jerome, Que. Fire destroyed a large section of the town, burning over a property owned by Mr. Beaulieu. On these premises was situated a gasoline reservoir buried several feet under ground in the manner usually approved by fire underwriters. This tank contained 180 gallons of gasoline. A short time after the flames had been extinguished around the place where the tank was, it exploded, the heat evidently having penetrated the earth covering the reservoir and generating gas which caused the explosion. This is causing no small concern in the minds of insurance men.

But it is the small public garages that are causing the most alarm among the underwriters. Too often careless chauffeurs, cleaners and helpers, regardless of the consequences to property or even to themselves, smoke in an atmosphere laden with the fumes of gasoline. Several serious fires have resulted in Montreal from this disregard for the ordinary laws governing personal safety.

Another aspect of the case is calling for consideration, and this is one which certainly calls for the serious attention of the special commission which is revising the city building by-laws. It is the situation of which there are too many examples in which a garage is established in the middle of a block surrounded by a variety of stores and dwellings facing on four streets bounding the square. More likely than not a garage has been created by the remodelling of an old stable or warehouse or small factory. Abutting on this, and attached to the rear portion of the stores and residences are usually frame sheds or back kitchens and probably other wooden outhouses. It is scarcely necessary to point out the extreme danger in which all these surrounding buildings are placed and increased fire risk to which they are subjected without any fault of the proprietors and which they are powerless to prevent. The increased risk to proprietors is likely to involve increased loss to insurance companies and this is a matter which appears to call for legislation or rules of some description. It cannot be denied that the situation is serious when garages can be planted down in the midst of such surroundings after all the properties in the vicinity have been insured. Much more is this the case when the construction of the garages is anything but fireproof, when the ceilings are low and when the employees either through ignorance or carelessness fail to observe the most elementary precautions that should be taken in such cases. When an insurance agent goes to the civic authorities to ask for a list of the garages that hold licenses or permits, and is told that no such list exists, the permits being entered in the departmental books indiscriminately along with others, surely this is the climax of exasperation.

The Slate Industry of Eastern Canada

The latest report of the Geological Survey branch of the Canadian Department of Mines gives an account of the slate deposits and industry of Eastern Canada. That portion of the province of Quebec which lies south of the St. Lawrence River is traversed in a northeasterly direction by a series of serpentines and related rocks, known as the serpentine belt. This belt is important for its production of asbestos —a large part of the world's supply—and for deposits of chromite, soapstone, copper and antimony, which it is known to contain. The principal quarry of roofing slate now in operation in Canada and some promising bodies of marble are also intimately associated with the igneous rocks of this belt. The deposit of decorative marble at South Stukely, operated by the Dominion Marble Company, Ltd., lies within this district. Slate of good quality, both for roofing and other purposes occur in several places in the Ordovician and Cambrian strata adjacent to the serpentine belt. In a number of these places quarries were opened between 30 and 50 years ago, but most of them have long since been closed from one cause or another, principally, it would appear, from an insufficient market at the time they were operated. At the present time these conditions have apparently changed for the better, and the slate deposits might properly receive renewed attention. The imports of slate into Canada for the year 1908 had a value of $131,069, while the slate produced in Canada during the same year, all of which came from this district, was valued at $13,496.

The Ordovician slates are dark, or bluish gray in color, and have an excellent cleavage, nearly vertical, which may be at any angle to the bedding planes. These slates have been quarried at Danville, Corris, Brompton, Melbourne and New Rockland. The last mentioned quarry is the only one at present in operation in eastern Canada. The slate produced is of excellent quality. The new Rockland quarry has been operated almost continuously since 1868. During the past eight years it has been worked by Messrs. Frazer & Davies under a lease from the New Rockland Slate Company. Some 35 men are employed, two steam drills and three derricks are in operation, steam and water power are used. Only roofing slate is now made. The quarrying is done in open pits, the work being cut down in benches. While working on higher levels in a deep pit, the waste rock is allowed to accumulate to some depth in the bottom in order to lessen the loss from breakage of good slate by falling into the pit after blasting.

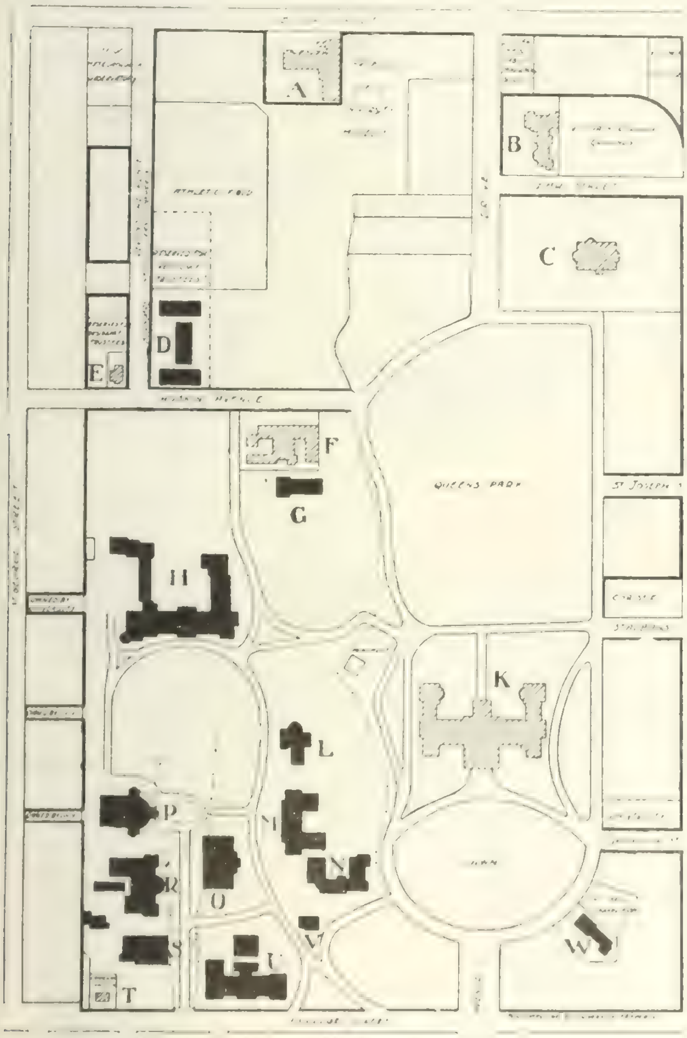
The Cambrian slates are green and reddish or purple in color, and where there is a mingling of these colors a handsome mottled slate results. The green color is known as the unfading green. They split less smoothly than the dark slate, having a coarser texture and are frequently not as strong. The quarries that have been opened usually show large bodies of slate free from quartz veins and sometimes having different colors in different parts of the same pit.

The corporation of Yorkton, Sask., have called for tenders for about 3,500 feet of water main and an equal length of sewer main.

The University of Toronto Heating Plant

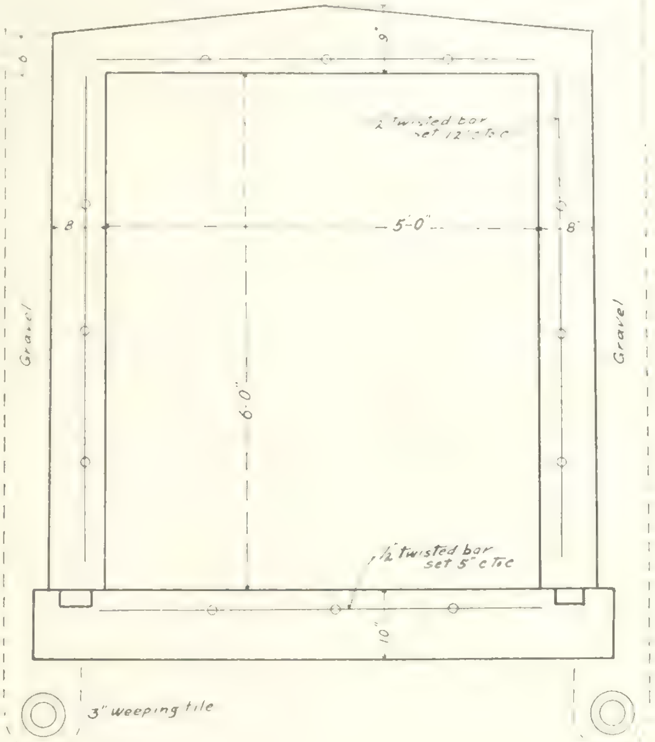
Heating on Gigantic Scale—Lighting and Power also Centralized—Nearly Six Thousand Feet of Tunnelling

The new heating, lighting, and power plant that is at present being installed by the University of Toronto, will be, without doubt, the most up-to-date of its type in Canada, and will rank favorably with the best in American cities. Service is being provided for the various buildings in all parts of the University grounds. Fig. 1 shows the lay-out of the numerous buildings, and is intended to give an idea of the magnitude of the undertaking in supplying all the colleges with heat from the same source. Since this plan was made there have been a number of additions completed or in the course of construction.



General plan of University property.

The Board of Governors have retained the firm of Darling & Pearson as their official architects on the work. Griggs & Holbrook are the engineers for the light, heat and power. The L. K. Comstock Company are contractors for the power house, tunnel system, as well as the entire electrical installation, Robertson Bros. being sub-contractors for the power house. Piping for the heating system, outside the power house, is being installed by W. J. McGuire Company, as well as all tying-in connections complete. Purdy & Mansell are the contractors for the power piping, while the John Inglis Company supply the rigging of all apparatus and the installing upon the foundations.



Cross section of concrete tunnel.

Power Plant Equipment

This equipment at present consists of two bat-

Excavating south of Engineering Building, showing forms teries of B. & W. boilers aggregating 1,000 h.p. capacity, with provision for future boiler extension when necessary.

The units from the Physics and Mining power houses are going to be used in connection with the new plant, consisting of one 50 kw., one 100 kw., and one 150 kw. units, as well as the new 300 kw. unit being supplied by the General Electric Company. This portion of the power plant is also designed and constructed with the idea of taking care of extension work of the University and affiliated colleges.

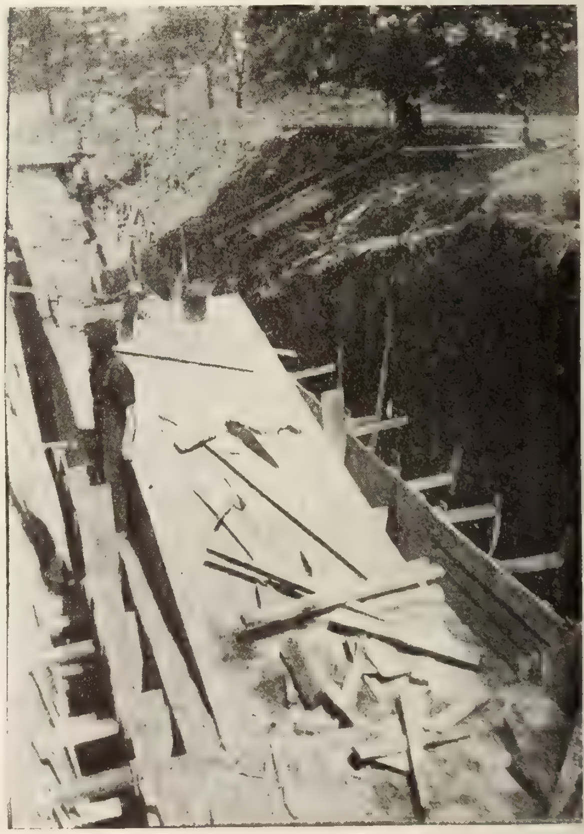
Concrete Tunnelling

Starting from the power house there is installed a 6 feet by 6 feet concrete tunnel through the Medical building, and branching on the west side of the Medical Building north and south. A branch main 5 feet by 6 feet runs south to the Thermodynamics building and west to the Physics, Chemical and Engineering buildings, with a branch connection at the northeast corner of the Thermodynamics building, leading south to the Mining and Milling buildings. The northerly main branch of the tunnel, starting from the Medical building, runs to the Museum, across the Carbrook property, with service branches to Domestic Science, Annesley Hall, Victoria Library, Victoria College, and Victoria Residences and Dining Hall. Service tunnels 3.5 feet by 6 feet are also run from the main branch tunnels to the various buildings en route, which include library, University College, Observatory, Gymnasium, Wycliffe and the Residences. When all parts are finally connected, twenty-seven buildings will be furnished with light, heat and power. The total tunnel system will be 5,875 feet long when completed, which includes all service tunnel connections.

Piping for low pressure steam main.

The concrete has been machine mixed throughout, batch mixers, the proportions being 1:3:5. Considerable trouble was experienced during the construction of the tunnel work owing to quicksand and other unusual soil conditions to be met, for which special

Piping north of Czar St.



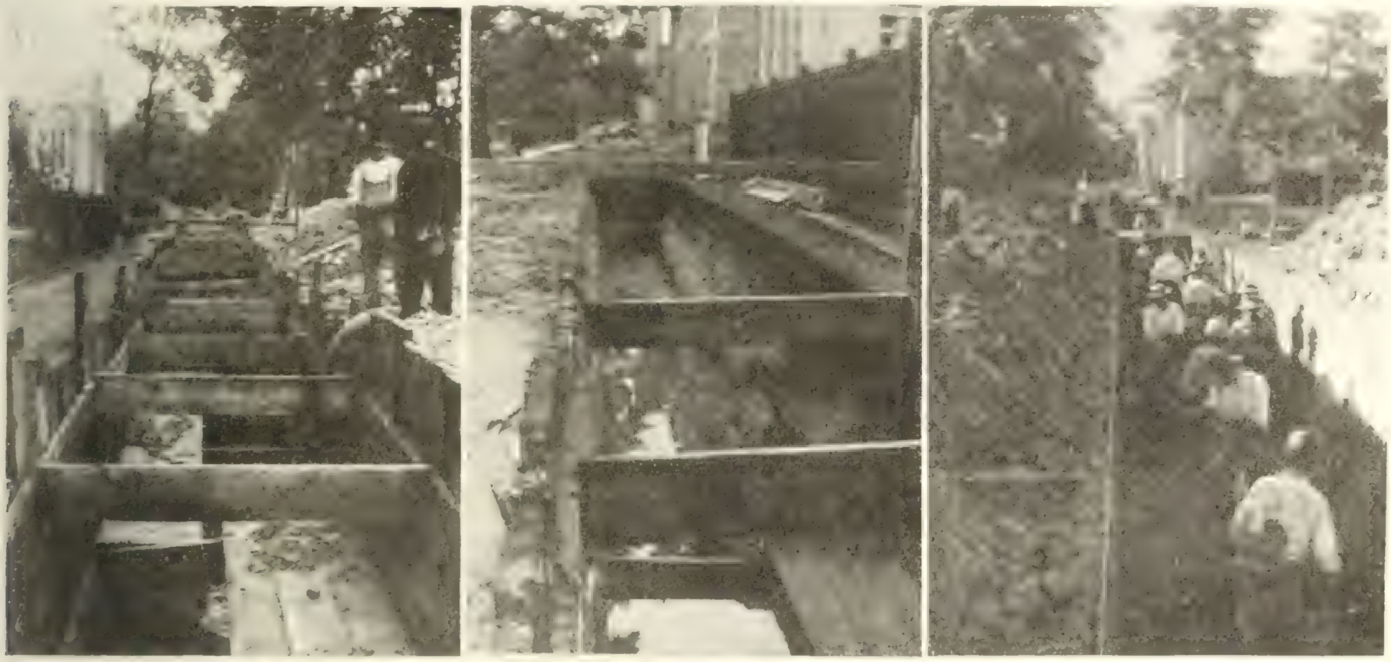
Timber forms ready for concrete roof.

sheet piling had to be used. No little amount of trouble was also occasioned by the unearthing of innumerable sewer, gas and water mains. Fig. 2 shows diagramatically a cross-section of the tunnel, which in all cases is covered by at least two feet of back-fill. The floor slab, 10 inches thick, is laid first and grooved as shown. The ceiling tapers from 6 inches to 9 inches in the centre. The walls, 8 inches thick, as well as the floors and ceiling, are reinforced with half-inch twisted steel bars. The Hough spacers are being used in the setting of the reinforcing bars at the proper centres.

In the walls this steel is set 12 inches, centre to centre, and 5 inches centre to centre in the ceiling and floor. The diagram also shows longitudinal reinforcing bars set 3 in roof, side walls, and floor slabs. A 3-inch "weeping" tile is laid below the tunnel in gravel, which material also extends over the entire outside of the walls. An extra large manhole is used thorughout the work for the admission of future piping. These manholes are in two sections with standard covers of double type. The entire tunnel is virtually complete south of the museum.

The Heating System

Starting from the power house there is a 20-inch steam main, with branch connections leading to the various buildings, diminishing in size as the decrease in load requires. Further, the tunnels contain a high pressure main with steam for domestic purposes, together with booster connections, to be brought into operation when an adequate supply of exhaust steam is unavailable. Together with the return main these pipes form the three lines occupying the tunnel. No mention is being made here of steam traps, drips, etc., for both high and low pressure mains, and innumerable other accessories that go to complete the equipment. It may be stated, however, that every provision has been made for items such as condensation line loss, which in this case, is calculated to be .1 to .09 pounds per square foot of heating surface per hour.



Excavating south of Household Science Building, showing branch tunnel north of Hoskin Ave.

Gravity Tanks

A noteworthy feature of the installation is the gravity tank method, whereby the individual heating systems in all the buildings are maintained uniform with regard to the water line at low level. From these gravity tanks all the water from the condensation is returned to the power house, where it is prepared to be used over and over again.

The working pressure of the boilers is 150 pounds and the intermediate pressure of the steam in the tunnels is to be fifty pounds, brought about by reducing valves in the power house. The actual heating pressure will be pre-determined by weather conditions, but not to exceed five pounds.

Electrical Installation

The electrical work also presented innumerable difficulties to be overcome in changing from the various old systems to a common three-wire distributing system. The power service is at 240 volts and the lighting service at 120 volts, d.c.

The power house is situated in the ravine and is sunk into the ground to obscure it from the vision of the Parliament Buildings, as well as from the University grounds in general. Another important feature is that this is the lowest point in the entire system.

The plant will be in operation when the University term begins in the fall.

Speed in concrete mixing and a perfect output accepted by the inspectors of the New York Public Service Commission, has been interestingly illustrated by a 1-yard Ransome mixer which mixes all the concrete used in the construction of a section of the Fourth Avenue Subway, in Brooklyn, for which the Tide-Water Building Company and T. B. Bryson of New York, are the contractors. 305 cubic yards of concrete have been turned out by the mixer and placed on the job in five and one-half hours, and this includes the time of such delays as caused by shifting the chutes, waiting for the cars, etc.

Mammoth Building Season for Canadians

Thirty per cent. Increase for First Six Months—Some Notable Figures from Twenty-Six Cities -Remarks from Building Inspectors

The returns for the first half of the year 1911 from twenty-six of the leading cities of the Dominion are compiled below, and compared with those of the corresponding half of last year. A number of the cities are shown in the table to have broken their previous records, and, taken altogether, the returns from this period of 1911 leads those of the first six months of 1910 by some $15,000,000. Remembering that the year 1910 was Canada's banner year in the building line, and considering the backward spring that hindered early operations in many parts of the country, it is remarkable to note that this immense sum forms some 30 per cent. increase over last year.

It will be observed that Toronto still leads this list, while Vancouver and Winnipeg interchange for second and third place. Vancouver has been seriously handicapped since June 5th owing to a strike in all branches of building trades. A general sympathetic strike was called on that date by the central bodies of organized labor, but it finally became confined to the building trades, and paralyzed that branch of labor throughout the whole of June. It is owing to this, perhaps, that Vancouver, heading the list as it did for the first three months of the year, as is shown in the returns published in the Contract Record of April 26, is obliged to assume second place again.

In the matter of June building some remarkable increases are shown. Moose Jaw leads all with an increase of 700 per cent. over June, 1910. Kingston reports 403 per cent. increase, Medicine Hat 393 per cent., and Windsor 307 per cent., with Saskatoon and Guelph also over the 300 per cent. mark. A few cities show a decrease for June, namely, Brantford, Fort William, St. Thomas, Vancouver, Stratford and Brandon; Vancouver decreasing 22 per cent. and the latter two over 60 per cent. each.

For the six months ending June 30th seven cities report a decline in the value of their building permits. Ottawa, it will be remembered, showed a decrease of 39 per cent. for the first three months of the year. Building has picked up slightly and the result is now a decrease of only 12 per cent. over last year's report. Lethbridge is still behind the records of last year, owing to the serious labor difficulties that were encountered early in the season. The conditions here were also affected to a certain extent by the miners' strike. According to Mr. Meech, however, prospects are brilliant for the remaining half year.

Winnipeg, Fort William, Strathcona, St. John and Stratford also report decrease in building operations, the latter amounting to over 65 per cent.

Turning now to the figures from those cities that have shown the greatest activity, from Prince Albert comes the announcement that it possesses a record

Town or City	June, 1910	June,1911	1st 6 mos. 1910	1st 6 mos. 1911	Approx. inc. % for 6 months
Toronto	$2,302,550	$2,384,400	$9,820,648	$11,939,953	22
Vancouver	1,162,940	906,706	6,885,880	9,188,406	33
Winnipeg	2,413,700	2,790,250	9,906,100	8,581,550	13*
Calgary	573,486	1,826,220	2,394,942	8,212,248	242
Montreal	1,585,254	1,780,860	7,126,880	7,305,816	2
Regina	255,318	716,025	1,342,003	2,936,930	111
Saskatoon	194,400	779,725	1,657,131	2,575,441	55
Hamilton	301,885	618,675	1,232,725	2,246,657	82
Edmonton	233,670	357,929	1,054,476	1,620,431	54
Victoria	227,600	250,800	1,202,835	1,432,585	19
Ottawa	302,000	404,975	1,690,025	1,393,370	12*
Moose Jaw	83,190	665,300	513,210	1,295,575	154
Brandon	98,950	30,725	401,700	803,574	101
Sherbrooke	150,000	350,000	300,000	675,000	125
Fort William	256,225	220,390	939,280	750,075	20*
Lethbridge	91,005	94,960	659,570	485,625	26*
London	38,586	44,756	452,466	458,423	1
Windsor	31,075	126,330	109,480	395,495	261
Port Arthur	65,375	183,450	310,465	315,660	2
Sydney, N.S.	69,789	98,247	204,652	382,052	87
Halifax	21,630	52,000	176,450	211,150	20
Strathcona	13,450	127,323	234,500	214,183	9*
St. John, N.B.	44,300	62,000	222,000	211,700	5*
St. Thomas	31,050	23,300	112,850	136,150	21
Kingston	11,545	58,125	100,143	136,462	36
Stratford	33,500	12,400	190,000	62,500	67*
	$10,592,573	$14,965,871	$49,240,411	$64,068,029	30

Increase for first six months of 1911 is 30 per cent.

*Decrease.

of 583 per cent. increase over the first six months of last year. The city of Guelph reports an increase of 323 per cent., and Windsor of 261 per cent. Calgary shows an actual increase of $5,817,306 over last year's first six months, which is an enormous development, considering the 152 per cent. increase by which the records of 1910 exceeded those of 1909. It will be remembered that ten years ago the population of Calgary was approximately 4,000.

Comparing these returns by provinces, Alberta leads, with Saskatchewan second. Quebec, Manitoba and New Brunswick all show a slight decline, but in no case greater than one per cent.

The position that the city of Toronto occupies in this list is a very clear indication of prosperity. The returns for the month of June, 1911, do not show an excessive increase over June, 1910, but the increase of over $2,000,000 worth of building for the first half of this year, corresponding to a percentage of 22, just doubles the increase of 1910 over January to June, 1909.

Moose Jaw, Sask.—Mr. W. F. Heal, City Clerk, writes: "The increase in building permits is the largest in the history of the city. Unusual activity prevails in every department of trades and labor, with a taxed demand for carpenters, bricklayers and concrete mixers. The civic improvement for the year will cost over $650,000. There is no idleness among common laborers, while the demand for help in surrounding districts is very great. Several new hotels, two new school buildings and a number of business blocks are included in the building for this year. The street railway will be in operation before the end of July."

Victoria, B.C.—Although the returns for the month of June show a slight falling off from the previous month, which was the record for this year, the increase over the month of June, 1910, is, as shown, very substantial. July is expected to break all records in building activity as there is a number of large buildings projected, for which permits will be recorded this month.

Edmonton, Alta.—J. Walter Drabble, Inspector of Buildings, states: "Work has been seriously delayed for the past three months owing to a cement famine. Several fair sized blocks are in the process of erection and we expect the commencement of the new Grand Trunk Hotel, an eight-storey building, in a very short time. There is an exceptional demand for dwelling houses, and according to the number of dwellings being erected, it would seem that local builders are doing all they can to fill the demand.

Hamilton, Ont.—Mr. John Anderson, Building Inspector, states that prospects are very bright and the outlook increasing. There is abundance of building material and supplies, and no labor troubles are evident.

Saskatoon, Sask.—Mr. J. E. Harrison, Building Inspector, writes: "The building conditions in the city of Saskatoon are excellent. Good prices are being obtained for houses, rents are good, and not a single house is empty in this city. Residences are being sold as soon as completed, and in many cases are being sold directly off the plans. Real estate values are increasing rapidly, and trade and labor conditions are good. We have quite a number of large and important buildings in the process of erection."

Regina, Sask.—Mr. O. F. Falls, Building Inspector, states: "Prospects are very bright for future building in Regina. Permits have been issued for several large buildings to be commenced shortly. A conservative estimate of building permits for Regina for the whole year is placed at $5,000,000. The total number of building permits issued to date equals the whole of the permits issued last year.

Winnipeg, Man.—According to the report of Building Inspector Rodgers, the city of Winnipeg is experiencing very increased activities. For the month of June permits were issued authorizing the erection of buildings to the value of $2,790,000. This exceeded by $350,000 the previous record for any month, which occurred in March, 1910. This year it is the greater number of buildings, such as residences and apartment blocks, instead of large buildings, that is bringing up the total, and confidence is felt that the figures for 1911 will exceed those of last year.

Windsor, Ont.—M. E. Brian, City Engineer, writes: "With regard to the conditions of the building trade in Windsor, I would say that the permits for the first six months of this year have exceeded the values of the whole of those of last year by some $3,500. We have already over $20,000 worth of permits issued for this month and the prospects for the remaining half of the year are exceedingly bright. All the tradesmen in the city have been very busy."

Vancouver, B.C.—S. H. Jarrett, Building Inspector, states: "The month's business in Vancouver has been very much affected by the strike of June 5th of several branches of the building trades which are still out. The increase of two and a quarter millions over the first six months of last year is very satisfactory and I still feel confident of a corresponding increase for the next six months.

St. Thomas, Ont.—Mr. J. P. Freek, Building Inspector, states: "Building progress is slow at the present time, but the outlook is promising for a further advance later on in the season. There is considerable new dwelling construction in progress, and brightening up of old properties and modernizing them is also general, for a great amount of which returns are not made to the building department."

St. John, N.B.—S. Thomson, Building Inspector, writes: "The first three months of 1911 were very dull in the building line owing to the backwardness of spring, and were much below those of the past year. Since the first of April, however, building activities have greatly increased and indications are favorable for the remainder of the season."

Strathcona, Alta.—A. J. McLean, City Engineer, states: "There is a considerable number of private residences and public buildings in course of construction here at present, and an increase in the issue of building permits over June is expected for this month."

Sydney, N.S.—Mr. D. McD. Campbell, City Engineer, states that in Sydney the building operations are exceedingly brisk at present. Many new dwellings are being erected and the outlook for the remaining half of the year is, to say the least, excellent.

London, Ont.—Arthur E. Nutter, City Architect, writes: "Building conditions generally are flourishing. There are several works in prospect and there is every indication of this year's figures exceeding those of past years. Building work was somewhat slow in getting started this year, but has since more than made up for this discrepancy."

Sherbrooke, Que.—The city of Sherbrooke up to the present time has kept no record of building permits. Mr. F. J. Griffith, City Clerk, states the following. "The season of 1911 up to the present time has broken all records, and without doubt at least $1,000,000 will have been expended before the end of the present season. Every contractor in this city is exceedingly busy and will be kept so until late in the fall. Operations are extended to all classes of buildings, and it might also be stated here that enormous extensions are being made to street railway, sewerage, and water systems, and electric power developments. There is a steady demand for all classes of workmen in the city and indications point to 1911 being a banner year in the building line for Sherbrooke."

Lethbridge, Alta.—H. W. Meech, Building Inspector, writes: "After a somewhat quiet half year it would appear that we are about to enter upon a good building period for the remaining part of the year. The miners' strike has been rather a drawback but there are signs of this being settled in a short time. If this is so, then, with the present indication of enormous crops everywhere in the district owing to the recent heavy rains, we cannot fail to see the large number of building projects that are now under consideration quickly materialize."

Halifax, N.S.—Building construction in Halifax has taken a great jump, especially during the last two months, compared with the records of last year. For the month of June permits were issued for $52,000 worth of building as against $21,600 last year. A notable feature in this city, as well as in Sydney and St. John, is that building operations were behind in the earlier part of the season but advanced so rapidly as to show a favorable increase over the half year just passed.

Fort William, Ont.—S. Macnamara, Building Inspector, writes: "We have quite a number of large blocks in course of erection at the present time and tenders are being called for others, but the outlook is a little quieter than last season in the building line."

The Situation in Vancouver

Since June 5 the building trades of the city of Vancouver have been practically at a standstill, and although meetings of the building trades council have been held almost daily, no agreement has as yet been reached. The fact that all the unions which have applied to the international headquarters for assistance are receiving strike pay from this source, enables the men to take a more rational view of the situation. It is constantly declared by the labor leaders that the dispute will not end until employers make a move, and emphatically assert that they would remain on strike until the demands of the united organized labor movement were conceded. The employing builders on the other hand emphatically declare that they are justified in (1) protecting their members in their rights to manage their respective businesses, in such lawful manner as they deem fit and proper; (2) the adoption of a uniform system whereby members may ascertain "who is and who is not worthy of employment;" (3) the investigation and adjustment by the proper officers of committees of the Employers' Association of any question arising between members and the employees, when such question shall be submitted to the Association for adjustment; (4) to make it possible for any person to obtain employment without being obliged to join a labor organization, and to support such persons in their efforts to do so if discriminated against by union labor; (5) to protect its members in such manner as may be deemed expedient "against legislative, municipal and other political encouchments."

Recently there has been considerable talk of arbitration, and a resolution was published by the independent contractors agreeing to place matters in dispute with the building trades in the hands of the arbitration committee. It is generally agreed the battle is not as to whether the carpenters shall receive $4.50 a day as previously demanded, or $4.25 a day as offered by the contractors. The one paramount question appears to be whether or not open shop shall prevail in this city. At the present time every effort is being made to end the strike with the object being, closed or open shops, a peaceful, amicable and speedy settlement of hostilities. It is reported that a small number of men have quietly gone back to work.

Montreal Carpenters' Strike

On Tuesday, July 18th, a number of carpenters in Montreal decided to quit work unless their employers would agree to give a minimum wage of 35 cents an hour. When work commenced last March they were being paid from 22½ cents to 30 cents an hour for a nine-hour day. Recently there was an agitation to make 40 cents an hour the minimum wage. Quite a number of employers were reported to have consented to pay 35 cents an hour as a minimum, and believing that this rate would become general the agitation was dropped. Members of the Builders' Exchange, however, who have been fighting for years for the maintenance of the open shop system, and the payment of wages according to every man's ability, have not fallen in line with the 35 cents proposition, with the result above mentioned. At the time of writing it would seem that there are about 300 men in the ranks of the strikers. This is but a small proportion of the 1,500 journeymen carpenters that are said to be employed in the city at the present time, so that although the men declare that they will fight to the finish, it is not at all certain that those who received an all round increase of 10 per cent. on the first of July, and are now drawing good pay, will sympathize with the "outs" sufficiently to make the strike a success. Quite a number of employers have declared that they will not be seriously affected by the walk-out. Some contractors are reported to have conceded to the demand for the 35 cent. minimum, while others are determined to resist such a proposal which they consider unfair in view of the agreements made between the union and the contractors some months ago, and which are still in force. A large number of non-union men are employed in the city, which gives the employers confidence that the strike will not seriously obstruct building operations.

Building in Ottawa

Ottawa, July 18th, 1911.

While the building of smaller classes of residences is behind last year, there is so much work in the larger buildings, and in repairs, that there has seldom been a time when all the trades were busier.

One brick manufacturer stated that for several years past the brick men in this city have not been able to supply the demand and although many more are being produced this year than previously, all the firms are behind in their orders. He estimated that 25,000,000 brick would be used in Ottawa this year. This is somewhat larger than last season.

Common labor is very scarce. The railway construction, not only in the vicinity of the city, but in all parts of the country, has a great deal to do with the shortage. The farmers, who usually pick up any unemployed at this season, are finding it a very difficult task.

There is practically no change in the prices of building materials. The rates struck in the beginning of the year hold good, and generally speaking there had been abundance in all lines of supplies with the exception of brick.

V. V. Rogers is doing a big work in grading in Ottawa South. He has awarded a contract for some $25,000 to O'Leary Brothers to cut down a hill and place it in a hollow spot and the work will begin this week.

There is some complaining that there had been no definite action taken with regard to the railway entrances into the city. Until this is done, the C. P. R. cannot begin the tunnel under the city. However, the absence of most of the cabinet ministers as well as the absence in

England of the heads of the C. N. R. and the Grand Trunk, has been largely responsible for this, and now that they have returned, a definite move in this regard is expected very soon. The decision on a site for the new departmental buildings has not been made, but now with the return of the ministers, it is expected that it will be announced very soon.

If the by-laws pass on September 6th in Ottawa, a great deal of additional civic work will be started. At this time the by-laws for a reinforced concrete high level bridge across the Rideau canal, at the end of Bank street, to cost $130,000, will be submitted to the electors. The government is to pay $80,000 and the city $50,000. At the same time a by-law will be submitted to install an electric booster system for supplying the high buildings with water and fire protection, and will cost $60,000. To provide for waterworks extension in Ottawa South, $50,000 will also be asked. This, with the present west end drainage scheme and the other big civic works already under way, will make a very active fall. In a short time tenders will be called for considerable street pavement and some additional sidewalks will also be constructed.

While there is so great activity in civic building, private work is becoming more active than at any time this season. The seven-storey addition to John M. Garland & Sons warehouse has been started. It is of reinforced concrete. A. Leb. Weeks is the architect. The construction has been begun on the new Congregational Church, and while there is some delay, it is claimed that the Westminster Church, which will be a stone building, will be started in a month or so.

It is practically certain that the Beaver Board Company will erect a factory either in Ottawa or Hull very soon. The promoters state that the new factory will be on a very elaborate scale, combining artistic effect with utility, and that it will be an expensive structure.

The largest commercial building in course of construction is the Blackburn building. The first section, which faces on Metcalfe street, is eight storeys high, and the remaining two sections will each be ten storeys in height. The entire facade of the building is to be of Stanistead granite. W. E. Noffke is the architect.

The Half Year in Montreal

Montreal, July 19, 1911.

The value represented by the building permits issued by the building inspector of the City of Montreal for the first six months of 1911 was $7,305,816. The total number of permits was 1,901. Last year the number of permits from January to June inclusive was 1,724, and the total value of buildings erected $7,126,880. The number and magnitude, and also the variety of operations now under way is something remarkable even for the commercial metropolis of Canada. As an indication of the growth of building enterprises in this city in recent years it may be stated that last year the total value of permits issued was $15,715,859, and the largest previous to that was under $9,000,000, in 1906. This year therefore promises to be a record one even under the miserable system of keeping records which allows buildings to be entered at estimated values sometimes fifty per cent. below their actual cost. The following table shows month by month the value of permits issued so far this year:

January	$ 365,840
February	642,428
March	1,101,577
April	1,711,971
May	1,981,385
June	[illegible]

There are said to be over 90,000 houses in Montreal and the records show that 621 new dwellings were started in the month of June.

The largest operations under way are the extensions to the Windsor and Place Viger stations of the C. P. R., the former estimated at some two million dollars and the latter $1,500,000. Some large office buildings, flour mills, apartment houses, theatres, and hotels run all the way up from $150,000 to a million dollars each.

Commencing with office buildings, the transportation building on St. Francois Xavier street between St. James and Notre Dame streets, takes the lead at an estimated cost of $1,000,000. Diagonally across the corner is the Dominion Express Company's new building to cost $600,000. Opposite this latter building is the Yorkshire building, like the others, ten storeys in height and fireproof throughout, costing something like $100,000. In this class also may be mentioned the new Birks building on Phillips Square, the Blumenthal and Kellert building on St. Catherine street, and the "Herald" Offices on Craig street to cost $150,000.

Among the hotels may be mentioned the New Freeman, formerly the Carsley department store block, the Mount Royal to be erected at the corner of St. Catherine and Peel streets, the Ritz-Carlton on Sherbrooke street west, the St. James Hotel extension, $70,000; the Cartier hotel and office building, $50,000.

Large apartment houses are being built in different parts of the city, showing that this class of building, of which Montreal has now a large number, is maintaining its popularity. Those now under construction may perhaps be headed by the Chalet apartments, costing $150,000; the Shaftesbury, $60,000; the Gloucester apartments, $90,000; the Lincoln Avenue apartments, the Ouimet apartments, the Mountain View apartments (rebuilding after fire), and others.

Among the factory and industrial establishments are the following: The National Bridge Company's works at Longue Pointe, $100,000; factory for N. A. Timmens, $64,000; Pierre Brault, rebuilding factory after fire, $35,000; A. Ramsay & Son Company, Limited, paint factory, $27,000; J. C. McLaren Belting Company, factory, $17,000; St. Lawrence Flour Mills (3,000 barrel) and elevator (350,000 bushels); Dominion Flour Mills (2,000 barrel) and elevator, costing about a million each; the Montreal Terra Cotta Lumber Company's plant, $150,000; James Strachan, bakery, $25,000; Stuart's, Limited, bakery, $25,000; coal storage and handling plant for the Montreal Light, Heat & Power Company, $70,000; Canada Paint Factory, $16,000; United Shoe Machinery Company, factory, $195,000; die factory, J. Dupre, $25,000; Shawinigan Water & Power Company's power house, $60,000; Wind Mill Point, elevator for Grand Trunk Railway, $125,000.

The postal authorities, not to be behind in accommodation for the public, are rebuilding the St. James street half of the General Post Office, $300,000. They are also building a new branch post office on St. Catherine street east, corner of Plessis at a cost of $85,000. Another new post office in Westmount and others are under contemplation.

Educational institutions are also receiving attention. Good progress is being made on the Fairmount Avenue school, the additions to which are costing $120,000. The commissioners have purchased land for a new high school for which plans are being prepared though it is doubtful if any work will be done before next spring. They have also purchased a large tract of land in Outremont for school purposes. Several schools have been completed during the present year. The Catholic School Board is also doing good work along this line. They are rebuilding the school recently burned down in Laurier Ward at an estimated cost of $55,000. A new school is being built in St. Edwards Parish to cost $34,000. The St. Gabriel Brothers are spending $50,000 on a school in Amherst Park, while others are being erected in Maisonneuve, Villeray and Point St. Charles. A new Catholic normal school is being built on Atwater Avenue to cost $150,000. Nearly all of these schools and colleges are being constructed of fireproof material.

A number of churches are being erected in various parts of the city. Perhaps the most expensive one is that of St. Stanislas de Kotska parish, at $142,000, with presbytery estimated at $35,000 additional. The Presbyterians are preparing to build a new church for the congregation of St. Giles in Laurier Ward. They are also building in Verdun. The French Methodists are about to open a new church in Ontario street and the Jews in a short time will open a fine new synagogue in Westmount for the congregation of Temple Emanuel. The site of the former synagogue of this name was purchased by the Windsor Hotel Company on which to build a power house and laundry. The foundation stone has just been laid for a new church for the parish of St. Elizabeth du Portugal to cost $56,000, A new Anglican church is about to be commenced at Montreal West.

The Y. M. C. A. is putting up three buildings at the same time, the new head office to be on Drummond street, costing over $300,000, with branches in Westmount and in Laurier Ward, costing between fifty and a hundred thousand dollars each. The branches will be finished this fall, but it will be nearly a year yet before the head office will be ready for occupation.

The General Hospital is undergoing improvements and an extensive addition which will cost several hundred thousand dollars.

The Bank of Montreal will open a new branch in the new extension of Windsor Station at the corner of Atwater Avenue. The Molsons Bank, in addition to making extensive alterations and additions to their head office building, is erecting a new branch at Lachine at a cost of $15,000.

Amusement caterers do not intend to forget the requirements of the public. Alderman Gauvin is about to erect a theatre at the corner of St. Catherine and Maisonneuve streets to cost $155,000. A new Sparrow theatre is talked of and plans are being prepared for a theatre building on St. Catherine street near City Hall Avenue. Another theatre company has bought property on St. Catherine near St. Urban street for theatrical purposes. In this category also must be mentioned the Hippodrome, which will be nearly three times as large as any theatre now in Montreal. It will be capable of accommodating ten thousand people and the cost will run up into the hundred thousands.

The McGill Medical building, which was recently opened, belongs to this year's construction, although it was commenced many months ago. The new galleries of the Montreal Art Association, which will be built on Sherbrooke street west, will be an ornament to the city, the first half costing $300,000, exclusive of furnishings. The head offices of the Artisans Canadiens Francais on St. Denis street at the corner of Vitre street, is now well up. It will cost over $70,000 when completed. A four-storey building to contain stores and offices of superior character is being erected at the corner of Peel and St. Catherine streets at a cost of $60,000. Another fine store and office building will be the "Coronation" building at the corner of St. Catherine and Bishop streets, costing $75,000.

The rebuilding of the Moreau Street Contagious Diseases Hospital will commence shortly and be rushed to completion. Two buildings to be used for light manufacturing are going up near the corner of St. Alexander and Dowd streets. These are the Rolland building, costing $50,000, and the Gillette Safety Razor Company's building to cost $112,000. The St. Pierre store and office building in the Morgan block, Union avenue, is to cost $80,000. The Rea building, with the additions recently completed, is now one of the largest and finest departmental stores in Canada.

The new jail which is being built at Bordeaux at a cost of two and a half millions, to accommodate 1,100 prisoners, is expected to be ready for occupation, in part at least, by February or March.

A great many store and warehouse alterations and office renovations are being carried out at an average of from twenty to thirty thousand dollars. At this figure some new fire and police stations are being erected in surburban sections of the city. Of a somewhat different character, although along the building line, is the construction of the Montreal dry dock, which will cost between three and four millions, and the widening of the C. P. R. bridge across the St. Lawrence between Lachine and Caughnawaga.

Another sign of prosperity is the large number of high class private residences that are being built in the outskirts of the city. These run all the way from $25,000 to $120,000. And this is not all. Among the projected building operations for which plans are being prepared, and some of which may be commenced this fall, are the new Grand Trunk Terminal offices, station and elevated tracks, for which plans have been prepared, calling for a total expenditure of $8,000,000. A horse exchange is projected to cost a million dollars. The Engineers' Club and the St. James's Club are to be extended at a cost of practically a hundred thousand dollars each. The Jacobs building, already six storeys high, is to have four more storeys added as soon as arrangements can be completed. The Shedden Forwarding Company, Limited, purposes erecting a nine-storey building on their valuable property at the corner of Craig street and Victoria Square. The G. A. Holland & Son Company intend putting up a ten-storey building on the site of their present store on St. Catherine near Peel. A juvenile court is also planned, and it is expected that work will be commenced on this structure very shortly, as land has been bought for the purpose and the authorities declare that it should be built as soon as possible. The extension of railway plants and steel works, and the construction of municipal buildings, warehouses and private residences, in addition to those mentioned, are being talked of, so that there is every indication that this season will be the greatest in the history of building operations in Montreal .

As an indication of real estate values in the city of Montreal it may be stated that a corner lot known as the Boxer property, at the corner of St. James and St. Francois Xavier streets, diagonally across from the post office, has just changed hands at $80 per square foot. The managers of the Mechanics' Institute have just refused $60 per square foot for their property at the corner of St. James and St. Peter streets. The "Herald" property, facing Victoria Square on St. James street, just west of McGill, has been sold to a syndicate for $232,000, or $30 per square foot. Dominion Square Methodist Church on Dorchester street, across from the Windsor Hotel, has just been sold for $350,000, which is $15 a foot. This property was bought in 1864 for $9,000. In 1894 it was appraised at $120,000. Two years ago the officials were on the point of accepting what was then considered a good offer of $230,000. Chalmers Presbyterian Church on St. Lawrence Boulevard was sold about a year ago for $29,999. A few days ago it passed into the hands of new proprietors for $40,000. These are only random figures which might be duplicated by many similar instances.

Demolishing Buildings in New York

It is quite probable that the average reader has very little conception at the present day of the extent to which buildings in leading cities of the country, and more particularly, perhaps, in New York, are being, and have recently been, demolished in order to make room for more modern and commodious structures. An idea of this may be gathered from the statement that during the past decade 8,000 buildings have been torn down on the Island of Manhattan alone for the purpose of making way for more modern improvements. Some of these have been single buildings, such for example as the 20-storey Gillender building, of steel skeleton frame construction, at Wall and Nassau streets, which was demolished in order that its site, with that of adjoining property, might be utilized for the erection of a 31-storey building. Again there have been times when whole areas have been swept away, notable examples of which are the site of the present Hudson Terminal Buildings, extending from Fulton to Cortlandt streets on Church; the Grand Central Station site, covering almost half a square mile in the heart of the city; the two square blocks upon which the Pennsylvania Railroad Station and Terminal now stands; the site of the mammoth Woolworth Building, and that of the Municipal Building, not to mention the extensive demolition of buildings that necessarily occurred to make way for the approaches to the various new bridges completed within the last few years.

Value of Buildings Demolished

According to the statistics contained in a very interesting article on "Razing of Buildings Now a Business Science," prepared by Allen E. Beals, and printed in the Record and Guide, the purchase in the last 21 years of old buildings in New York City by house wreckers or those whose business consists in part at least in the demolition of old buildings, aggregated nearly $26,000,000, of which amount practically $5,000,000 was the wrecking value of the buildings demolished in 1909. Eight years ago, according to the authority named, there were only seven house-wrecking companies in the city, while to-day there are 200. Some idea of wrecking values may be gathered from the fact that the hospital building at Twenty-third street and Lexington avenue was sold to a wrecking company for $250, with the understanding that it would be removed from the site in twenty-one days. It proved to have a steel grillage foundation worth $1,500. The same company began on June 1 to tear down the Hospital for Ruptured and Crippled, the Grand Central Palace and twenty other four and five-storey buildings in that vicinity, all representing a wrecking value of about $10,000. The Gillender building already referred to was sold to wreckers for $50,000, although it cost $500,000 to build. One company tore down forty-two buildings in fifty-two days and among them was a massive brewery containing vast tonnages of machinery.

Dispositions of Old Materials

As to what becomes of the old material from the demolished buildings, Mr. Beals points out that common brick when cleaned of mortar will be sold to a second-hand material dealer for $2 a thousand and they will eventually find their way into interior walls of many modern buildings at approximately $3 a thousand. Since so-called new light-hard brick are no longer permitted to be used in new buildings the demand for second-hand brick has continually increased. The only waste is the mortar between the joints, the plaster and the old bats that cannot be sold again as brick. While the Grand Central Terminal was being demolished the contractors are said to have shipped 100,000 old brick a day for almost a year to various points along the Hudson where the New York Central Railroad has some filling in to do. In this case no attempt was made to save the brick taken from these operations. The steel girders are also a source of barter. When they are standard shapes they are practically as good as new. A little emery wheel grinding and some waterproofing paint puts them in shape to go into suburban mills and factories and not infrequently into speculative apartments of the cheaper grade.

Wrecker Must Be Responsible

The wrecker of buildings must have great resourcefulness and a perfect organization in spite of the fact that his help is almost always of the unskilled labor class. He must be a keen judge of building material values to know whether there is any market to-day for black marble mantelpieces, iron, gas and water pipe, oak window sashes, mahogany stair railings and steps, hardwood flooring, etc., of the type used 10, 15, 20, perhaps 50 years ago. He must know what the market is for brown stone, for old heating apparatus, elevators, if the building contains such a device, and other material. If it is an office building that he is figuring on tearing down he must know whether there is at the time a good demand for second-hand girders and cast-iron columns, iron shutters, iron stairs and old vault lights. If he finds that the building which he is examining is of an irregular shape so that the cross beams and girders are of different lengths, if the doors are of extra size and the window frames smaller than those now being used or even larger, or the floor is badly cut up by partitions, he will naturally make his bid for the wrecking contract correspondingly low.

The system of taking wrecking contracts is different in almost every locality. In New York the owner never has to pay for the removal of a building. In Baltimore the owners of the "News" building paid $22,000 to a contractor to remove the building and sold the salvage rights to one man for $4,500. The destruction of a building requires more consideration than the mere matter of getting it down as quickly as possible. Dynamite could be used for that purpose provided the building was far away from other structures and pedestrians did not have to be protected.

Organization Secret of Success

The secret of the wrecker's success is in the organization he maintains. Most of the leading companies have a most perfect system, insuring economical demolition of buildings. They have several picked foremen who are expert appraisers of second-hand material and under these foremen from fifty to one hundred cheap laborers are employed. These are provided with crowbars, hammers or sledges, according to the type of work to be torn down, and the proportion of that which is to be saved. There is usually to be found among them an expert iron worker, who directs the careful removal of marketable steel girders and columns. Marble, granite and other building stone is also carefully taken out by these trained men.

The New Montreal Jail

In March next, according to present calculations, the new Montreal jail, which is under construction at Bordeaux, six miles from the old Montreal Jail, will be completed and the prisoners transferred to the new prison. The old prison was built to accommodate 200 persons of both sexes, but for many years only men have been incarcerated there, and room had had to be found for as many as four hundred at a time. The new jail will be for men only and will contain ample accommodation for 1,100 prisoners.

The ground area that will be covered by the new buildings and appurtenances will be about twenty acres and this will be capable of extension. The estimated cost of the new structure is, in round figures, $2,500,000.

The design has been worked out in accordance with suggestions made by Governor Vallee, whose many years of experience and thorough study of the question have eminently fitted him for the important task of laying out a detention house for criminals that will at the same time give them suitable accommodation, and enable the prison staff to guard the prisoners efficiently and supply all their wants with the utmost convenience, combined with safety and economy. The plan shows a structure of six wings, branching out like the spokes of a wheel from a central rotunda. This rotunda will be 120 feet in diameter and two storeys high. From each storey a full view of the interior and exterior of each of the wings may be had. There will be six rows of cells in each wing with thirty-two cells in each row, and five aisles passing down between the different rows of cells from end to end. For prisoners awaiting trial the cells are eight feet wide, eleven feet long and nine feet high. For condemned prisoners the cells will be six feet three inches wide, eleven feet long and nine feet high. The space between the wings will be used by the prisoners for exercising. The plans call for 1,100 cells in the completed building, of which six hundred and fifty will be required immediately. The building will be of reinforced concrete, granite, pressed brick, and terra cotta, and will be perfectly fireproof. The administration building, just inside the main entrance, will be 180 feet long by 32 feet wide.

The food will be served to all the prisoners on the ground floor of the rotunda as they pass in from the yards to their cells. The next floor will contain the chapel for the Roman Catholic prisoners. The Protestants being only about twenty-five per cent. of the total prison poulation, will require a smaller chapel, which will be situated in the Administration Building. Governor Vallee is an advocate of the single cell system, such as obtains in Belgium, which tends to prevent the corruption of the young or first offenders by old and hardened criminals.

Not only has much thought been given to the arrangement of the cells and the matter of waiting on the prisoners in the most modern way, but special attention has been given to the method of locking them in their cells and opening the cell doors. It will not be necessary to go from cell to cell opening each door separately, for a system of levers operates in such a manner that every door on one side of a ward may be opened at once; or one-third of them may be opened at a time. Or, if desired, one alone may be opened and the remainder stay closed. Again, if it is necessary to prevent the prisoners from slamming the doors back and forth they may be locked open. The thirty-three doors along one side of a wing weigh two tons, but these can be moved all at once by one man using the levers.

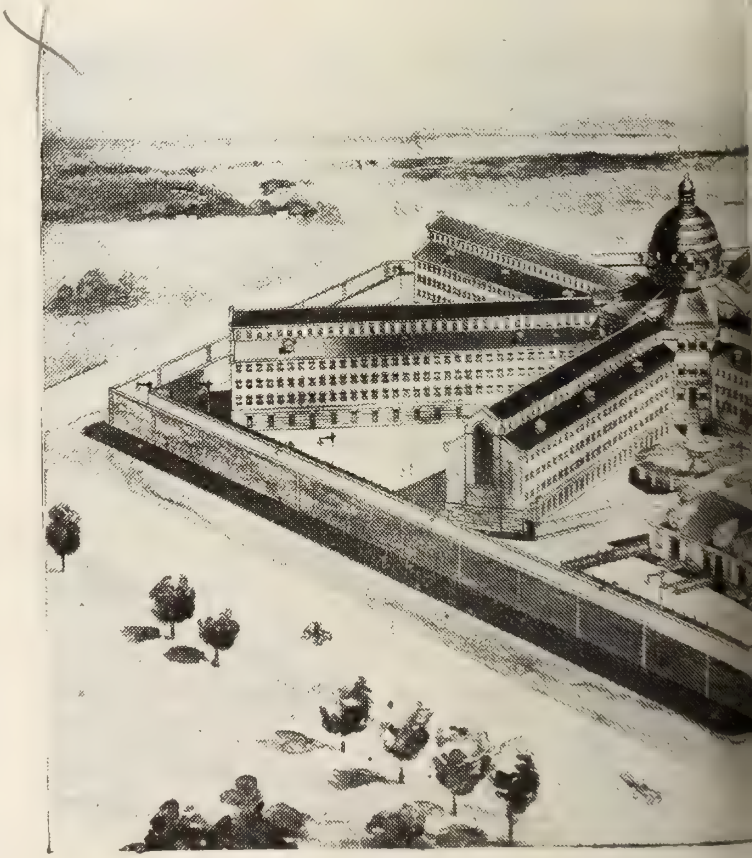
The jail buildings will be enclosed by two walls, the inside wall to be 18 feet high, and the outside one 24 feet high. There will be a space of 18 feet between the two. A broad avenue will run from the road that skirts the river up to the massive entrance in front of the Administration Building. The entrance is flanked by heavy stone abutments built into the high cement walls that surround the prison.

By the time the authorities begin to use the new jail, street cars will be running to the door. It is the intention that the prisoners shall be carried to and from the Court House in special cars. A switch will be put in branching from the Bordeaux line and leading inside the prison walls. It is expected that this service will be very effective, and the most up-to-date in existence.

It is the intention to establish work shops similar to those in connection with penitentiaries. It is believed that the men can be more profitably employed than in breaking stone.

The kitchen is a roomy apartment fitted up with every modern convenience. From the kitchen small trucks will run on narrow gauged tracks to a small elevator that runs up directly under the tower. This will carry the huge pots of soup to the six wickets on the main floor. Past this three times a day the prisoners will march, each one to receive his portion. This he will carry to his cell, where it will be eaten. Every prisoner will be in full sight of the guards while this procession is passing to and from the cells.

The dungeons are not dark and gloomy, but are light and airy. Unruly prisoners will not be manacled



New Montr

nor chained to a ring in the wall, but outside the cell door is a hose and turncock.

The cells for the insane are also of novel construction. Each cell has three doors. Should an insane prisoner become unmanageable and violent the guards can enter the cell from three sides at once, and overpower him before he can injure anyone.

Provision has been made for the execution of murderers. In a recess where two wings meet, close to the central rotunda, there is a small balcony. Over the balcony protrudes a steel beam for use as a scaffold. The door leading to the scaffold is in the wall of the "condemned" cell. This is one of the largest cells in the jail; also one of the brightest. It is immediately under the eye of the guard who sits in the central cupola.

The jail will have its own power house, where electricity will be generated for the purpose of pumping the water that will be used throughout the building, as well as for heating and ventilation. The sanitary conveniences are of the very latest and most approved designs.

The architects appointed by the government to prepare the plans and have oversight of the construction in association with Mr. Brossard, are Messrs. Messrs. Marchand & Haskell, St. James street, Montreal.

The general contractors for this work are Messrs. J. B. Pauze & Company.

Cost Records in Construction Work

Ignorance of real costs is a danger whose seriousness every contractor will appreciate. What is less clearly appreciated is the extent to which real costs are not known, and the degree to which construction estimates are based on gravely unreliable data. Discussing this matter, Sanford E. Thompson, consulting engineer, who has been associated for years with Frederick W. Taylor, the pioneer in scientific management, says:

Walls.

Besides being of use as a preliminary step toward the introduction of scientific management, cost keeping, that is, cost determination of work in progress, is of value to the engineer for making up estimates and checking the work of the builder, and to the builder in bidding on subsequent contracts and keeping track of the cost of the work as it progresses from day to day. In construction work based on the principle of cost-plus-a-fixed sum, and other similar systems, the accurate recording of detail costs on different parts of the work is absolutely essential for submitting the accounts to the owners.

To accomplish any of these aims, the cost records must be accurate enough to serve:

(1) As records for estimating cost of subsequent jobs.

(2) For immediate use.
  (a) To determine whether the builder is making or losing money.
  (b) To fix any point of loss or of too small profit.
  (c) As an incentive to the foreman and workmen.

As generally practiced, cost keeping is so approximate and inaccurate as to be of comparatively little value for any of these purposes.

The point just made may be illustrated simply by a comparison of the methods now usually employed in estimating materials and labor. In estimating materials the engineer or contractor notes every item, usually taking the schedule from the plans, and by adding a percentage for contingencies reaches a total which will check fairly well with the actual subsequent cost. Before he starts to do any work, he must order the required amount of each material separately, and the cost of each item is carefully looked into to see that the lowest figures are obtained consistent with the quality of the work required.

With labor, on the other hand, the plan heretofore adopted has been largely a system of guess work. Frequently one hundred or more carefully tabulated material items are set down while the estimate for labor is given in one lump sum, and yet the labor may amount to one-fourth or one-third the sum total of the materials. The variation in the actual cost of the labor from that given in the estimate almost always makes the difference between a profit and a loss to the contractor. These "guesses" at labor costs are commonly excused because it is claimed that the work done by different workmen varies to a great extent, or that it is impossible to provide for unforseen contingencies. This, however, is merely dodging the whole responsibility. The real reason for such approximations is that the contractor usually does not know the time and cost of doing each kind of work with any degree of accuracy; and the fact is only just coming to be recognized that it is possible to determine in advance how fast each element of the work should be done nearly as accurately as the cost of supplies and materials are now determined, and that once having the fundamental data, it is possible to estimate labor nearly as accurately as material.

Winnipeg Electric Company's Chimney

The largest ferro-concrete chimney in the west, if not in the whole of Canada, is now under construction by the Winnipeg Electric Railway Company, for their new steam auxiliary plant east of Mill street, Winnipeg. The plant, which is now under construction, is designed to accommodate steam turbines with a capacity of 15,000 horse power, to be used as a stand-by for their hydro-electric plant at the Pinnawa channel of the Winnipeg River. It will supplement the present steam plant on Assiniboine avenue.

This chimney, which is being constructed by the M. W. Kellog Company, of New York, will be 251 feet in height and will give accommodation for double the number of boilers to be placed in the first installation. Work has now been in progress for about two months and the contractors are considerably more than half way through, for they are above the 100-foot mark. With reasonable weather conditions they should be away by the middle of August.

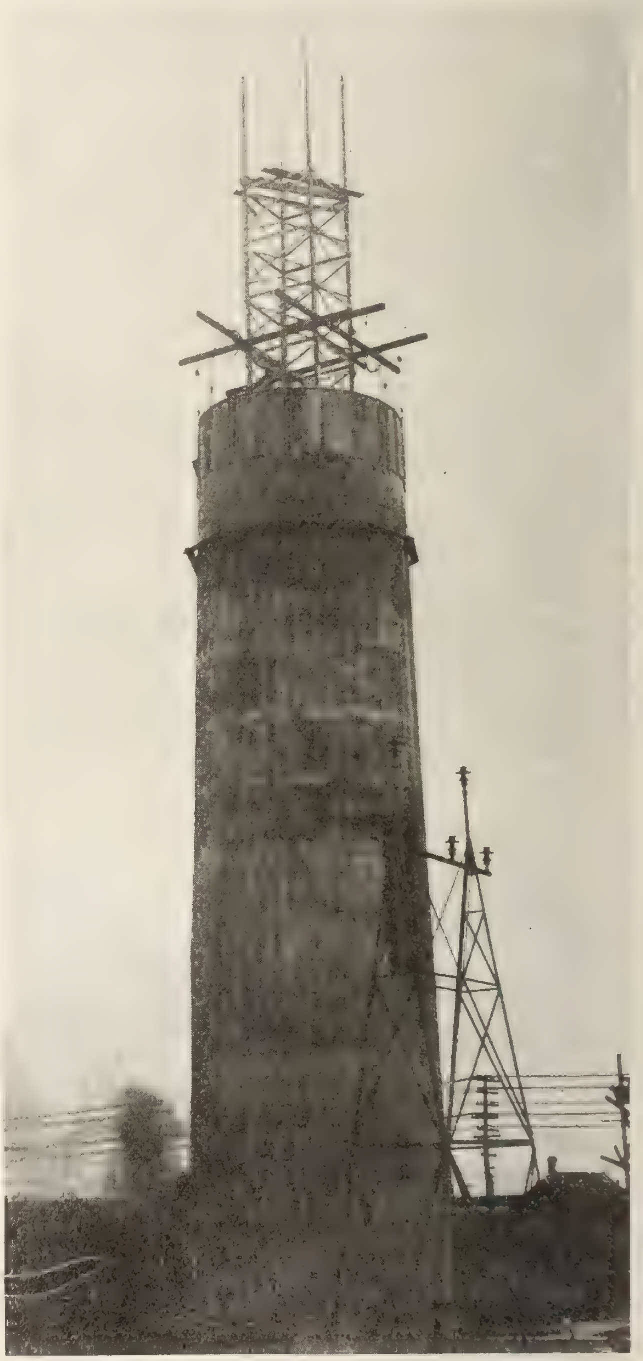
The dimensions of the chimney are 251 feet in height, 13 feet inside diameter at the top, with a concrete cap, 22 feet 6 inches inside diameter at the base, and 25 feet outside diameter. The base is a solid monolith of ferro-concrete 35 by 35 feet and 5 feet 6 inches in depth. It is carried on 169 piles, each 45 feet in length, driven to bed rock. In the construction there is being used 13 tons of twisted steel reinforcing rods and 8 tons of wire mesh. The chimney is being carried up at the rate of six feet four inches every working day.

The formation at the plant is not particularly favorable to the construction of plant of this weight. The soil to bed rock is a combination of silt and clay, most subject to the softening action of water. For this reason extraordinary precautions were necessary in securing an adequate foundation. The base is exceptionally strong, there being no stint on the amount of steel used. The chimney proper starts with a shell 15 inches in thickness, tapering to six inches at the top. The reinforcing rods are carried up vertically, being spaced at the top by a framework held in position by a temporary platform which is accurately placed by means of a plumb bob dropped to a central stake in the base. Heavy steel wire mesh is then woven in with the rods.

The forms, inside and out, are of steel, and of a special design controlled by the contractors. They are constructed so as to permit of the desired taper, and are taken in with each change of elevation. All material is handled through the inside of the structure where an elevator and bucket hoisting plant have been installed.

In the base a mixture of 1:3:5 was used, but in the chimney only the cement and clean sharp sand are being used. It is mixed to a thin consistency in a polygon mixer and poured from there down a chute into a trough in the interior of the chimney. From there it is baled into buckets and hoisted to the top, where two men attend to the pouring. The mixture is of a heavily fluid consistency so that little or no tamping is necessary. It flows freely through the wire mesh and makes a clean smooth surface against the forms. A single layer is considered a day's work and is completed before operations cease at night. In fact, when delays have occurred during the day the men have had to work until 9 o'clock at night. By morning the concrete has set sufficiently to permit the forms being raised and the work progresses continuously.

The new power plant has been practically completed up to the ground level, this being the heaviest part of the work. Ground was broken last fall and the foundation and sub-foundation work pushed throughout the cold weather, for it was found that the earth is more readily handled in deep excavations when the frost is heavy. Under one half of the building is a huge well for the handling of the cooling water supply for the plant. It is built entirely of reinforced concrete. At a depth of 40 feet a trench was run to the Red River, and beneath the tracks of the Canadian Northern Railway, through which are carried the intake and outlet pipes of the system. This part of the system is in duplicate in order that there may be no delays due to the necessity of clearing away the accumulation of sludge from the river water.



The Prevention of Scaffold Accidents

No Stringent Rules Regarding Scaffolds in England Master Builders and Workmen Differ as to Causes—Helpful Suggestions

Building operations conducted by the aid of scaffolding, and the various auxiliaries incidental to the use of scaffolding of all kinds, are necessarily of hazardous nature and, in spite of the most effective precautions that can be devised, accidents can scarcely be avoided at times.

At present building contractors are not fettered by legal enactments so far as concerns the design and construction of scaffolding, but, in addition to being subject to the responsibility established by common law, they are affected by the Notice of Accident Act, 1906, and the Workmen's Compensation Act, 1906. The second of these Acts makes the builder liable to pay compensation for personal injury resulting from any accident to a workman unless it can be proved that the injury was caused by "the serious and wilful misconduct of that workman."

While we do not believe that the provision in question has had any material effect on the design of scaffolding, it certainly has saddled master builders with an additional insurance rate, and, in the opinion of competent judges, has distinctly encouraged foolhardiness and want of care on the part of workmen. As shown by statistics, most of what may be termed scaffold accidents on buildings are caused by men slipping, stumbling, over-balancing, and tripping over obstacles, some are due to falling materials, some to the improper use of brick and other hoists, and a small percentage to the collapse of scaffolding and the breaking of ladders and planks.

Those who represent the men contend that insufficient scaffolding plant, unsuitable materials, and the absence of safeguards, are responsible for most of the accidents that occur. Others, representing builders' foremen, admit that accidents are occasionally due to faulty poles and putlogs, and defective tying, but state that the main cause is carelessness on the part of the men. Master builders agree generally with the foregoing statement, and attribute the bulk of the accidents occurring to carelessness, want of thought, the taking of unnecessary and undue risks, and the systematic neglect of safeguards provided.

We do not take the position that accidents never occur as the result of defective material or inadequate design, for unsuspected faults often exist in timber, and the building trade still includes some who do not accept the high standard of efficiency set by firms of good standing. Nor do we say that the men as a class are careless and wilfully neglectful of their own safety. But we cannot avoid the conclusion that the responsibility for mishaps rests less upon master builders than upon their men.

In confirmation of this view the following extracts may be quoted from the Report of the Building Accidents Committee, dated October, 1907.

Referring to scaffold construction, the Committee say:—

"We are convinced that serious dangers are due to insufficiency of plant and the use of defective materials for scaffolding, coupled with unskilled and careless workmanship in the erection of scaffolds. This is naturally the more likely to be the case with the so-called 'jerry-builder,' than with the contractor for large works."

On the question of carelessness on the part of workmen, the report says:—

"It is of little use to require employers to provide safeguards unless the workers are also required to make proper use of them. Nearly all the master builders who gave evidence referred to what they call "the carelessness of the workmen," as a cause of accident. They say that accidents happen through the contempt which some workmen have for proper prudence and precaution in following their employment. So, too, an insurance company says that "the greater proportion of building accidents could be avoided if it were possible to instil into workers the necessity of taking ordinary precautions, not only for their own sakes, but for the sake of others." Without endorsing these opinions, we are convinced that workmen do run unnecessary risks, that they thoughtlessly remove planks or supports from one part of a scaffold to serve some other purpose, leaving a trap for others to fall into, and that they ride up on the crane load or in barrow hoists to save trouble of mounting ladders."

The cheerful optimism pervading builders' men in this country extends to workmen employed by engineering contractors, and prevails more or less all over the world. Nevertheless, it is the fact that precautionary measures on the part of employers are useless without voluntary co-operation from the employed, and we feel sure that builders in particular would be encouraged to make further efforts if their workmen would take care to observe the various safeguards already provided.

The inculcation of this spirit among builders' men may justly be regarded as one of the most effective means for reducing the number of scaffold accidents.

Although masters provide scaffold plant, and are responsible for the erection of the main scaffolding about a building, they cannot compel men to be cautious, nor can they insist upon the exclusive consumption of beverages which are favorable to surefootedness and steadiness in walking. These matters come within the province of the men themselves, as also do the use of ladders, steps, trestles and planks for auxiliary purposes in connection with the main scaffolding.

So far as the latter is concerned, the practice of reputable firms leaves very little to be desired. In support of this view, we may refer the reader to the Home Office memorandum of January, 1902, and the Draft Regulations recommended by the Building Accidents Committee in 1907.

The only suggestions made with regard to scaffolding in the former are to the effect that all working platforms above the height of 10 feet should be provided with a fixed guard rail 3 feet 6 inches above the scaffold boards, and with a guard board close to the platform to prevent the fall of materials; that runs between different parts of a scaffold or building should be not less than 18 inches wide, and constructed or supported so as to prevent unequal sagging;

and that scaffold boards should be supported at each end by a putlog, and not be allowed to project more than [illegible] inches beyond the supports unless lapped by another board resting partly on or over the same putlog, and partly upon other putlogs.

Apart from clauses relating to scaffold construction generally, the latter document cannot be said to go far beyond the practice already followed by builders of good standing, the chief recommendations to employers for the prevention of scaffold accidents being: That boards in working platforms and runs shall be adequately supported; that gangways more than 5 feet high shall be at least 27 inches wide, and supported so as to prevent undue and unequal sagging; that single plank runs shall not be used more than 5 feet above the ground or floor, the width to be 18 inches, above 5 feet high, and 27 inches above 12 feet high, and provision made for undue and unequal sagging; that bricks, pipes, and chimney-pots shall not be used for the support of platforms, gangways, and runs; that working platforms shall have fixed guard rails, and continuous guard boards to prevent the fall for materials, and that openings in floors and working platforms shall be properly fenced.

Part II. of the Draft Regulations is somewhat more helpful, as it provides that workmen shall cooperate with employers by reporting any defects they may discover, by abstaining from interference with scaffolding plant, appliances, and safeguards, and shall not adopt unauthorized or unsafe means of getting about the building.

As our readers are probably aware, no regulations as to scaffolding have been issued since the presentation of the report mentioned, and the Building and Engineering Works Bill introduced in 1909 did not pass into law. Although further legislation does not seem to be necessary, it is probable that regulations governing the construction of scaffolding would be in the interests of conscientious builders because it would have the effect of discouraging undue economy on the part of speculative builders, and place competition on a more equal footing. But, for any future regulations to be equitable and satisfactory, they must impose definite responsibilities upon the men who use, and frequently misuse, scaffolding plant, appliances, and safeguards.—The Building Age.

Aesthetic Treatment of Concrete

Simplicity of intention in constructional design may issue, says Professor Beresford Pite, F.R.I.B.A., in a native or spontaneous aesthetic quality. For example, an undesigned beauty reached without treatment is often attained by such a structure as the Forth Bridge or a ferro-concrete silo. Again, mediaeval architecture grew up as a constructive method without aesthetic purpose, and yet achieved results of great beauty. Consequently, he asked, "Is not the opportunity given by the new process of reinforced concrete building one that could be utilized for the erection of the much-desired original and modern style of architecture? Are the new material and method together sufficient motive?" It had to be asked whether truthfulness of design to constructive purpose and elemental soundness of proportion were in themselves sufficient to provide that pleasantness to the eye which is desiderated. Four conclusions might be safely drawn: First, we have no instinctive guidance towards an unbiased originality for a concrete architecture; second, abstract principles like those invoked of proportion are of no assistance; third, superficial treatments, as by color, are insufficient for architectural expression, though valuable in assistance; fourth, the texture of concrete surfaces modifies and imparts special character to any forms employed for achitectural purposes. Therefore, while modern considerations of utility and of novel constructional methods determine proportions, and may ultimately develop aesthetic qualities, the scholarly and critical analysis and employment of traditional architectural forms suitably modified for execution in concrete is the proper method for the aesthetic treatment of concrete. A historical review of the development of some characteristics of Egyptian, Greek, and Roman architecture furnishes proofs of the non-relation of aesthetic treatment to direct constructive facts. Idealized representations of ancient types form the basis of both Egyptian and Greek characteristics, while the Romans frankly separated the decorative from the practical purposes of architecture. In Gothic art, however, the constructive craftsman was the artist, and the development of decoration is integral with building craft. In other crafts, like wood and plaster work, motives are imitated from stonework, and illustrate the modifications produced by the texture of the material into the design of details —of this the Elizabethian ornamental plastered ceilings originating from Tudor vaultings are illustrations. Modern novelty of constructive method does not remove a necessity for study of architectural development. The latter will aid adaptation and modification, and thus pave the way for development. Modern Continental design is too eager to demonstrate that elasticity possible in employment of form in unusual architectural relations. At home we still are safely and timidly putting brick and stone fronts to concrete buildings. There is a great future before concrete building, and it deserves that close and patient architectural study which, deriving from the past, will give certainty to the future aesthetic treatment of the material.

The C. A. P. Turner Company, who make a specialty of reinforced concrete bridges, buildings and manufacturing plants, with headquarters in Minneapolis, have recently established a branch office in Winnipeg to take care of the Western Canada business. This office is situated in the Canada Block.

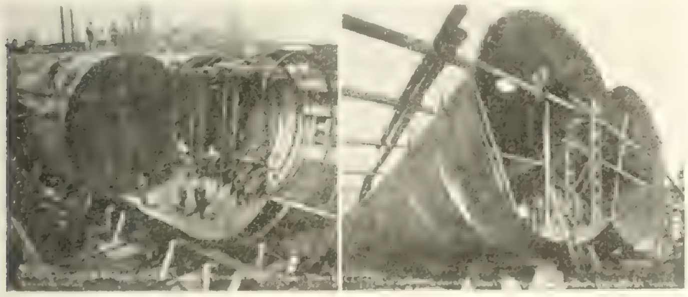
An official report shows that Canada produces 83 per cent. of the world's supply of asbestos. In 1909, 2,000 men were employed in the industry. In the Black Lake quarries, Province of Quebec, there are 15,000,000 tons of asbestos rock in sight. The Russians are the only real competitors in this business, and the Canadians do not fear much from them. A considerable proportion of the output is used in the production of asbestos protected metal, used for roofing and sheathing. Besides being fireproof, this material does not corrode and is not affected by moisture or acid. This branch of the industry is only a few years old, but is growing rapidly.

The contract for the installation of a waterworks system for Penticton, B. C., has been awarded to Messrs. Macdougall & Co., 532 Granville street, Vancouver. The contract included the laying of 20 miles of steel and cast iron pipe, and the construction of a reservoir, intake chambers, etc. The cost will be about $65,000.

The La Salle Street Tunnel in Chicago

Old Tunnel Impeded Navigation—New Structure Difficult to Manoeuvre—Method of Placing Unique

The La Salle Street tunnel at present under construction in Chicago is unique, and the methods employed are novel, from an engineering point of view. For instance, one feature of note is that the steel tubes, as shown in the accompanying illustration, were built to the outside diameter, floating down adjacent to their permanent position, and lined with concrete. Comparing this with the methods employed by the Michigan Central Railway in constructing their tunnel across the Detroit River it will be observed that the operation is the reverse. The Detroit River tunnel consisted of two twin steel tubes in short sections, sunk and filled around with concrete. These tubes were built in the shipbuilding yard, floated down the river, sunk to correct position on a pile foundation, and concrete was placed around them from a mixing plant on a scow.

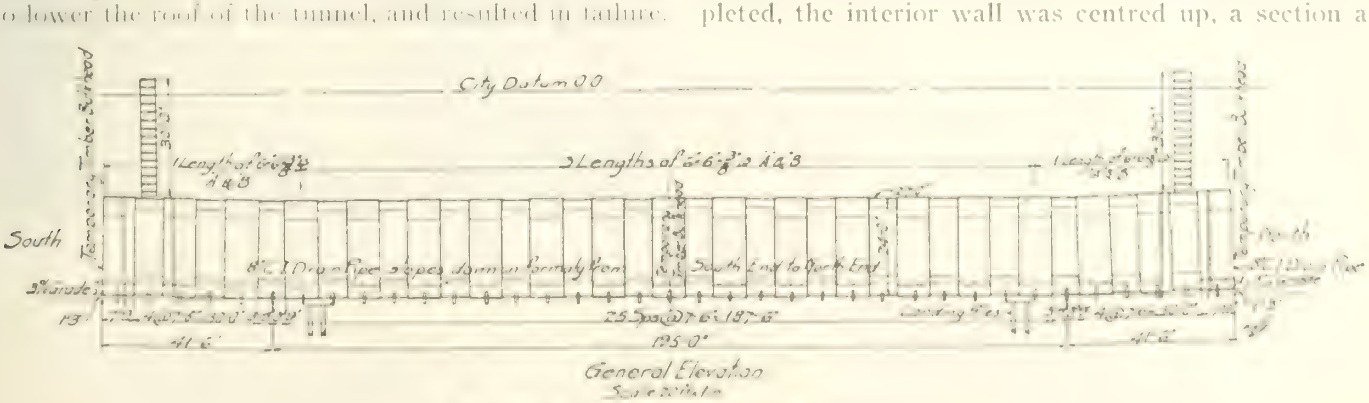

The twin steel tubes. At the left, steel work being erected, at the right, the steel completed

In constructing this tunnel under the river at La Salle street the unusual problems encountered are responsible for the necessity of unique methods. The location of the new tunnel on the site of the old brought many complications. Added to this was the requirement that the tunnel should connect temporarily with the surface lines near Michigan street at the north end, and near Randolph street at the south end, and should be so designed that a connection could be readily made with the subway when building without interfering with traffic in the tunnel.

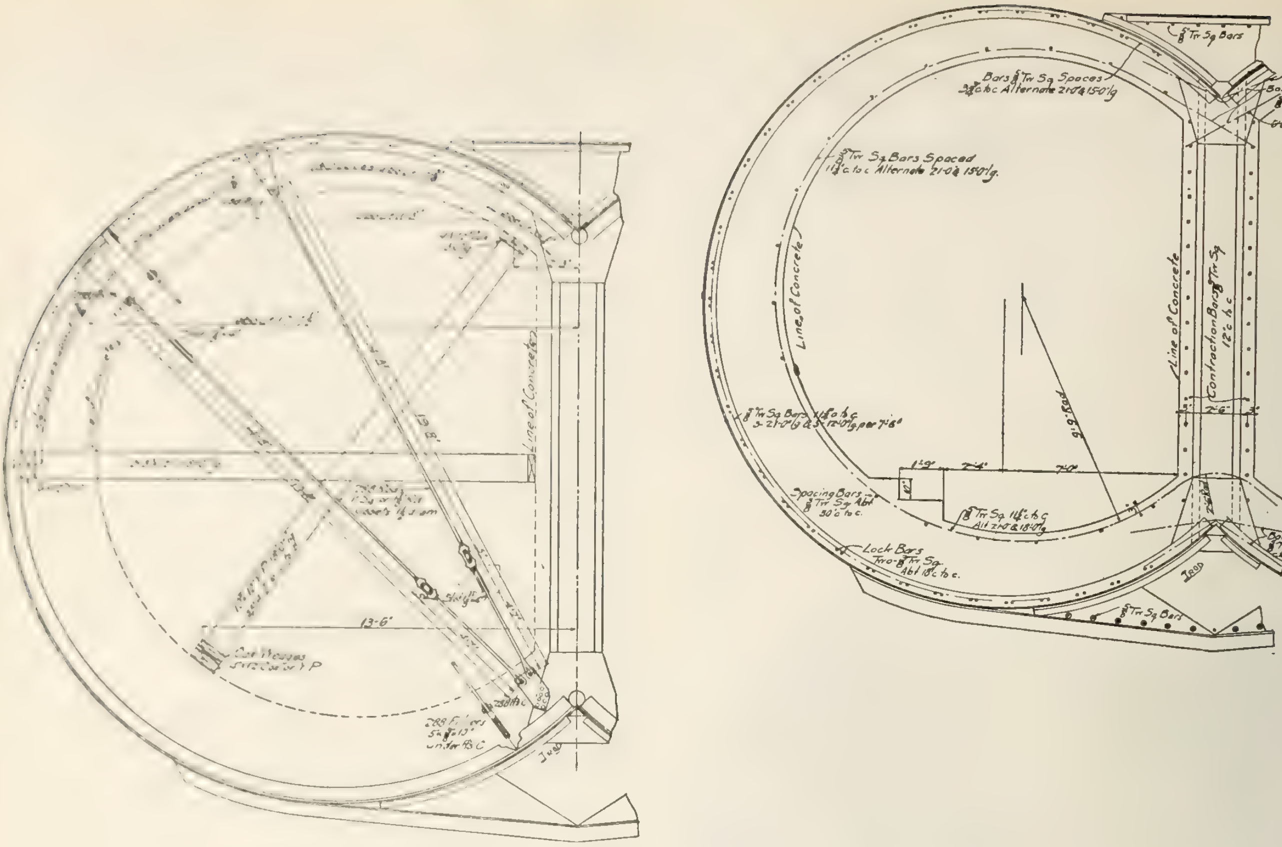
To review the work on the La Salle street tunnel, we find that the original tunnel, built in 1869-71, impeded navigation by not allowing the larger vessels to pass over it. In 1906, attempts were made to lower the roof of the tunnel, and resulted in failure. It was then necessary to remove the entire river section to meet with the requirements of the government. This was completed in March, 1907. After considerable investigation, the Board of Supervising Engineers adopted a plan for a tunnel as shown in the accompanying section. This tunnel is so designed, that it can ultimately be used in connection with a future subway, but at the present must be used by cars coming to the surface at either end.

The possibility of building this tunnel by the open cut method was considered, but the United States Government would not permit obstruction to navigation, and consequently the river section is built with a double floor steel shell as shown. This river section is built of twin steel cylinders, joined together and lined with concrete. The tubes do not form two complete cylinders, but they have been joined so that the circumference over-lapped. These tubes were made at the shipbuilding yards on the north branch of the Chicago River, and when completed, were floated down to place and sunk. This was an unusual and interesting feat, but the method of completing the concrete work is still more novel, and will be found of infinitely greater practical value because of the far greater number of smaller places in which it can be utilized. The tunnel sections consist primarily of an inner and an outer shell of steel, these being connected and strengthened by wing walls at appropriate intervals, and the design contemplating the ultimate filling of the space between these shells with concrete. The larger part of this concrete was placed while the tunnel was still at the ship yards, the object being to weigh it down to the water line so that a minimum amount of water would be required to sink it when it was towed to position. This left a space of about one-sixth of the circumference to be completed when the tunnel was finally located on the river bed.

What is of great interest, is the 3-ft. concrete wall separating the two tubes. This is practically a girder, 3 feet wide, by 17 feet high, and 278 feet long, and as this was poured in the drydock before the steel cylinders were moved down to their permanent position, constituted the stiffening girder which allowed the twin tubes to be handled down the river. When the steel work in the drydock was sufficiently completed, the interior wall was centred up, a section at



Elevation showing position of the tunnel


Line of Concrete
13'-6"
19'8"
Shift
⅝" Tw Sq Bars
Bars ⅝" Tw Sq Spaces 3¾" c to c Alternate 21'-0" & 15'-0" lg
⅝" Tw Sq Bars Spaced 11¼" c to c Alternate 21'-0" & 15'-0" lg.
Line of Concrete
Line of Concrete
Contraction Bars ⅝" Tw Sq 12" c to c
Bond Bars
7'-6"
9'-6" Rad
1'-9"
7'-4"
7'-0"
Spacing Bars ⅝" Tw Sq Abt 30" c to c.
⅝" Tw Sq 11¼" c to c Alt 21'-0" & 18'-0" lg
Lock Bars Two-⅝" Tw Sq. Abt 18" c to c.
Trod
⅝" Tw Sq Bars

On the left, details of temporary bracing, on the right, position of reinforcing steel

a time. Previous to this, the section of concrete between and below the tubes had been run, and the centering for the wall included a short section of both arch and invert. After the completion of the centre wall, reinforced as shown in the section, the ends of the tube were closed with bulkheads, and the tubes were floated down to position.

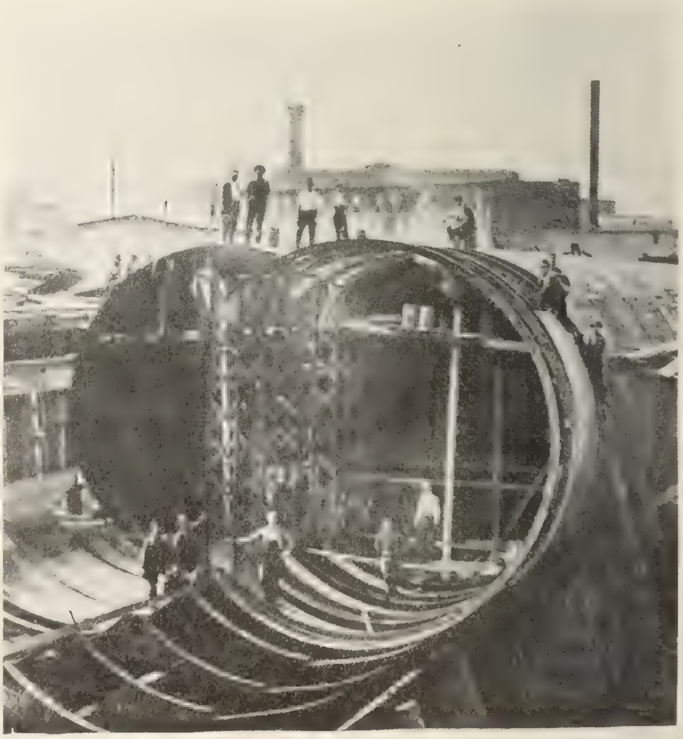
The lining for the tunnel was placed while they were floating adjacent to their permanent position. Two 1 cubic yard Foote mixers were set up on platforms at each end. They were mounted on rollers so that they could be rolled from one tube to another very easily, and the maximum wheelbarrow haul was one-half of the length of either tube. Mixers were worked alternately on eight hour shifts, and concrete was placed at the rate of 200 cubic yards in 8 hours.

Sections, five feet in width above the invert were first run. For running the sides and the arch, forms were used consisting of 2 in. x 6 in. ship-lap laid over segmental ribs built of 2 in. x 12 in. planks sawed to circumferential shape. As this arch was filled in, the two large tubes sank gradually until finally at about completion a very small portion of the top surface showed, and they resembled huge whale-backs lying there in the Chicago River.

In excavating the trench for the tunnel, the old tunnel floor made it a hard problem for removal. Dynamite and large dredges finally proved it.

In sinking, the tubes were suspended from scows at each end. Water was let into sections of the tubes through a 4-in. pipe at each end, with branches leading to the three compartments of each tube. The locks in the drainage canal at Lockport had been closed so that there was no interference with the current. The tubes landed on the sets of piles which had been driven to proper height, and were then filled around with clay and sand.

The most interesting feature, from our standpoint is, of course, the large girder used between the two tubes. It is a rather unique use of concrete. Note in the detail of the reinforcing steel how the circumferential rods are carried up through the side wall, and that the concrete both in the arch and invert, and also in the exterior fill in top and bottom, become part of the T-section of the girder.

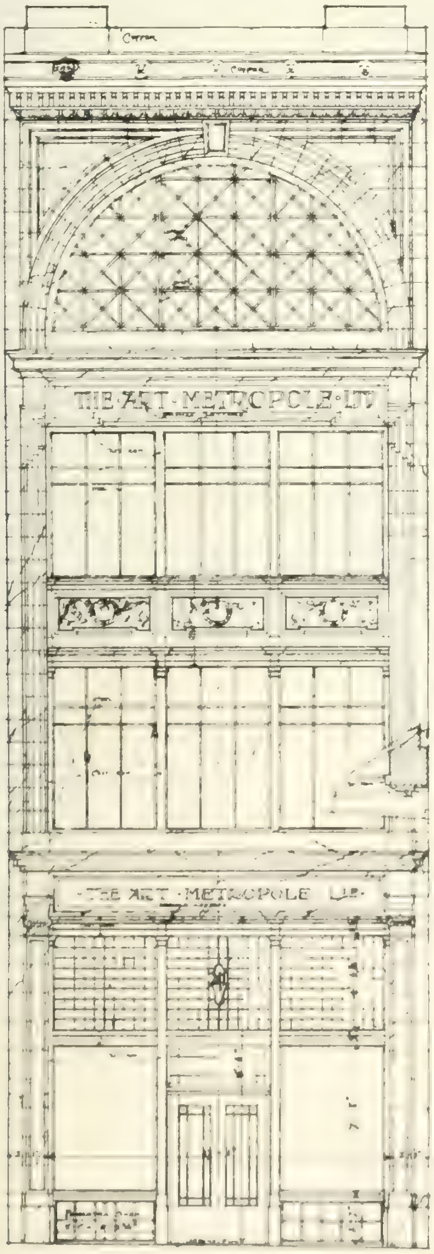


Tunnel showing position of girder and overlapping circumference

The next step in tunnel construction will be to build the tube itself of reinforced concrete as was done in large sewer work in Paris, building them completely first, and then placing them in position. It seems that this method of concrete-steel tubes for railroad crossing might be used much more extensively. If a series of buttresses could be built across the river, analogous to the first step in our present gravity dam construction, and on this foundation lay a steel-concrete tube, as used in the La Salle street tunnel, a combination bridge and dam would result which could be used to good purpose. The whole problem is one of the greatest interest, and this last instance presents an interesting use of a concrete lined tube made rigid with a reinforced concrete girder of rather unusual dimensions.

New Headquarters

The accompanying illustration is a front elevation of a new building in the course of erection on Yonge Street, Toronto, owned and to be occupied by the Art Metropole, Limited. The structure will be of brick and steel construction, handsomely faced with stone, with an available floor area of 11,000 square feet, devoted to show and supply rooms, blue-print department and a picture gallery. Mitchell and White, Toronto, are the architects. Excavation work is well under way, and it is expected that the entire building will be ready for occupancy early in October. The structure will cost in the neighborhood of $35,000.



Quieter Homes

A plan that is being worked out successfully in several of the United States is to dispense with streets, as far as possible, in residential districts. The thoroughfare is no longer a street but a wide concrete sidewalk with broad stretches of lawns that extend back to the buildings. Delivery wagons approach from the rear of the houses through wide, clean, alleys; while automobiles can make use of intersecting streets so that they can stop within a few rods of any house in the block.

There are many advantages in this plan for residential sections, the clean appearance of such a place for homes, without dust or street refuse, being the first consideration. It is much quieter and more secluded, as there are no teams or drays clattering past; it is safer for the children, as there is no danger from speeding automobiles. Also, it is much more economical, as the owner who laid out the track did not have to allow so much area for street use; there is no expense to the householders for macadam or asphalt pavement; while each property owner's share of expense for the central sidewalk would be about equal to his assessment for a cement walk on an ordinary street. Of course, the business streets of these towns are laid out in the customary design.

Practical Limits of Concrete Mill Building

In the course of the discussion on the comparative cost of mill building at the recent annual convention of the National Association of Cement Users, L. C. Wason of the Aberthaw Construction Company, brought out the point that there is a sharply defined limit of load which determines whether concrete or mill construction is the most economical type. An example was cited of a factory building, built some years ago, in which economy was the first consideration. The floors were designed to carry 800 lb. per sq. ft. on 24 ft. spans and it was found that these conditions, reinforced concrete was by far the cheapest material, much cheaper than either structural steel or wood. In general, theeconomic limit is 200 lb. per sq. ft.; for lighter loads, mill construction is generally cheaper. For heavier loads reinforced concrete is cheaper in first cost.

The electrical resistance of plain concrete is the subject of a recent report of a German commission. The report contains the details of the methods of testing, the quality of the mixtures and determinations on electrical resistances of the concrete specimens in air, fresh water, salt water and artifically dried. The principal conclusions of these tests made on mortar blocks 8 x 8 x 36 ins. are as follows:

For a current above 0.1 amp., an increase in current brought about a reduction in resistance.

Resistance in the mortar or concrete decreased as the temperature increased.

The decrease in resistance for the same increase in temperature is the same in gravel concrete as in broken stone concrete but the former has the greater electrical resistance.

Resistance increased with drying and was greater in fresh air than in salt water.

Resistance increases as the amount of mixing water or the included water decreases.

Destructive Conflagrations

Fire losses throughout the Dominion have been extraordinarily heavy during past years. Thus, according to a compilation lately presented in a Canadian publication:

The fire losses in Canada for the first four months of the current year total $5,361,875, an average of $1,340,468 per month. This is equal to a daily loss of $44,682. In other words, $1,861 worth of property has been burned every hour since the new year dawned, or $31 every minute. The losses for the past two years have been as follows:

Month	1909	1910
January	$1,500,000	$1,275,246
February	1,263,005	756,625
March	851,690	1,076,235
April	720,650	1,717,237
May	3,358,276	2,735,535
June	1,360,275	1,500,000
July	1,075,600	6,386,674
August	2,582,915	1,667,270
September	1,615,405	894,125
October	2,208,718	2,195,781
November	935,191	1,943,708
December	1,433,813	1,444,860
Total	$18,905,538	$23,593,296

Adding to these figures the total for the first four months of 1911 gives a fire loss in 28 months of $47,860,709, an average monthly loss of $1,709,311. In addition, there has to be recorded a disastrous list of fire fatalities. During the first four months of the year 77 lives were sacrificed. In the 28 months since January 1, 1909, no less than 552 persons lost their lives in fires, a monthly average of almost twenty persons.

Average European Loss

The annual average loss of six nations in Europe were compiled from records of varying years and the years grouped, with this result:

Country	Annual fire loss.	Loss per capita.
Austria	$7,601,389	$0.29
Denmark	660,924	.26
France	11,699,275	.30
Germany	27,655,600	.49
Italy	4,112,725	.12
Switzerland	999,364	.30

Estimating Canada's population in 1910 at 7,500,000, the fire loss per capita in the Dominion was $3,14, compared with $2.70 in 1909, with an estimated population of 7,000,000.

The Canadian Underwriters' Association is deeply interested in this question of fire losses, and in Quebec it now exerts its whole influence to overcome conditions which in the past have compelled the exaction of high premium rates.

A C. P. R. Appointment

Mr. P. B. Motley has been appointed engineer of bridges by the management of the C. P. R. Mr. Motley succeeds Mr. C. N. Monsarrat, who was recently appointed chairman of the Quebec Bridge Commission. This appointment is in accordance with the principle of promotion usually observed by the C. P. R. authorities, as Mr. Motley had been for some time chief assistant to Mr. Monsarrat. Mr. Motley received his education and training in engineering in England and has been with the C. P. R. continuously since 1892. During the intervening period he has held various important positions in the designing office and also in practical construction work in connection with the building of steel and other bridges. Mr. Motley is a member of the Canadian Society of Civil Engineers. His promotion is undoubtedly well deserved, and he is receiving the congratulations of his professional associates, among whom he is well known and popular.

Concrete for Malt House

What will be, when completed, the largest malting plant in the world, is now in course of construction at Milwaukee, Wis., for the Hansen Malting Company, of that city.

This plant will have an annual capacity of 2,000,000 bushels of malt, and it will have storage facilities, provided by 18 circular tanks, each 20 feet inside diameter, and ten inter-space tanks, for 750,000 bushels of grain.

This plant is being built of reinforced concrete throughout, and its designers expect not only a better plant, but a cheaper one, by using concrete as their building material.

The plant comprises a malt-house, walls to be raised to an average of 75 ft., ground dimensions 167 x 197 feet; a grain cleaning house, 42 x 60 feet, walls to be raised 160 feet above grade; a power house, 30 x 45 feet; a one-storey office building, 30 x 35 feet; and a small dwelling house for the Malting Company's millwright.

As the constant vaccum must be maintained in the greater portion of the malthouse, and as the air within the malthouse contains a large proportion of moisture, brick walls have been found to leave much to be desired in this type of construction. Concrete walls will, it is claimed, be stronger and more impervious to moisture.

The A. Monsted Company, who are building this malting plant, are using thoroughly up-to-date methods. Their engineer, Mr. A. D. Whipple, has designed and patented a system of forms for the tanks which reduces the labor cost on this portion of the work to three-quarter cents per square foot of form. The circular forms are built of wood, metal lined, and are raised with jack-screws. Eight to ten jack-screws are required for each tank, and one workman is stationed on each tank form, which is decked over completely. One of the 18 men is the crew captain, who, by signal, conducts the operation of all the jack-screws simultaneously. On each circuit the entire form is raised one-eighth of an inch. It will be seen that the tank forms are kept in almost constant motion; the tanks being raised three feet each working day.

Concrete is being placed by the Wm. B. Hough Company's (Chicago) G-Y gravity system. This requires two men at the delivery spout and one man at the hoist, the wages of the three aggregating $8.00 per day. As the average daily output of concrete is about eighty yards, the labor cost of placing the concrete is about ten cents (10c.) per cubic yard.

Reichert metal forms, manufactured by the Reichert Manufacturing Company, Milwaukee, are being used for the walls, the labor cost of handling them thus far on the job being nine-tenths of one cent (9/10c.) per square foot of form. Under the most favorable conditions, Mr. Whipple estimates the labor cost on wooden forms for this work would have been at least four cents (4c) per square foot of form. He estimates the total cost, lumber and labor, of wooden forms for the malthouse walls alone, at $15,000. From data thus far available, the use of the Reichert forms will save at least $7,000 over and above the purchase price of the large outfit of Reichert forms in use on the job.

The malthouse is of the Saladin-Prinz pneumatic type. F. L. Bader is the architect in charge.

Standard Specifications for Reinforcement

The following specifications have been submitted to the American Society for Testing Materials for adoption as standard for steel reinforcing bars for concrete:

1.—Steel may be made by either the open-hearth or Bessemer process. Bars shall be rolled from billets.

2.—The chemical and physical properties shall conform to the following limits:—

Properties considered.	Structural Steel, Grade		Hard Grade*		
	Plain Bars	Deformed Bars	Plain Bars	Deformed Bars	Cold Twisted Bars
Phosphorus, max.—Bessemer	0.10	0.10	0.10	0.10	0.10
Open-hearth	0.05	0.05	0.05	0.05	0.05
Ultimate tensile strength, pounds per square inch	55,000-70.000	55,000-70.000	80,000 min.	80,000 min.	Recorded only
Yield point, min., pounds per square inch	33,000	33,000	50,000	50,000	55,000
Elongation, min. per cent. in 8 inches	1,400.000 / tens. str.	1,250.000 / tens. str.	1,200.000 / tens. str.	1,000.000 / tens. str.	5 per cent
Cold bend without fracture:					
Bars under ¾ in. in diameter or thickness	180°d. = 1t.	180°d. = 1t.	180 d. = 3t.	180 d. = 4t.	180°d. = 2t.
Bars ¾ in. in diameter or thickness and over	180°d. = 1t.	180°d. = 2t.	90°d. = 3t.	90 d. = 4t.	180°d. = 3t.

*The hard grade will be used only when specified.

3.—In order to determine if the material conforms to the chemical limitations prescribed herein, analysis shall be made by the manufacturer from a test ingot or blow of steel, and a correct copy of such analysis shall be furnished to the engineer or his inspector.

4.—Chemical determination of the percentage of phosphorus shall be made by the manufacturer from a test ingot taken at the time of the pouring of each melt of steel and a correct copy of such analysis shall be furnished to the engineer or his inspector. A check analysis may be made by the purchaser or his representative, in which case an excess of 25 per cent. above the required limits will be allowed.

5.—For the purposes of these specifications, the yield point shall be determined by careful observation of the drop of the beam of the testing machine, or by other equally accurate method.

6.—Tensile and bending test specimens may be cut from the bars as rolled, but tensile and bending test specimens of deformed bars may be planed or turned for a length of at least nine inches, if deemed necessary by the manufacturer, in order to obtain uniform cross-section.

Tensile and bending test specimens of cold-twisted bars shall be cut from the bars after twisting, and shall be tested in full size without further treatment, unless otherwise specified as in (c), in which case the conditions therein stipulated shall govern.

It is desired that the testing and acceptance for cold-twisted bars be made upon the hot-rolled bars before being twisted, the hot-rolled bars shall meet the requirements of the structural steel grade for plain bars shown in the specification.

7.—At least one tensile and one bending test shall be made from each melt of open-hearth steel rolled, and from each blow or lot of ten tons of Bessemer steel rolled. In case bars differing ⅜ in. and more in diameter or thickness are rolled from one melt or blow, a test shall be made from the thickest and thinnest material rolled. Should either of these test specimens develop flaws, or should the tensile test specimen break outside of the middle third of its gaged length, it may be discarded and another test specimen substituted therefor. In case a tensile test specimen does not meet the specifications, an additional test may be made.

The bending test may be made by pressure or by light blows.

8.—For bars less than 7/16 in. and more than ¾ in. nominal diameter or thickness, the following modifications shall be made in the requirements for elongation:

For each increase of ⅛ in. in diameter or thickness above ¾ in., a deduction of one shall be made from the specified percentage of elongation.

For each decrease of 1/16 in. in diameter or thickness below 7/16 in., a deduction of one shall be made from the specified percentage of elongation.

The above modifications in elongation shall not apply to cold-twisted bars.

9.—Cold-twisted bars shall be twisted cold with one complete twist in a length equal to not more than twelve times the thickness of the bar.

10.—Material shall be free from injurious seams, flaws, or cracks, and have a workmanlike finish.

11.—Bars for reinforcement are subject to rejection if the actual weight of any lot varies more than five per cent. over or under the theoretical weight of that lot.

12.—When an inspector is furnished by the purchaser to inspect material at the mills, he shall have full access, at all times, to all parts of the mills where material to be inspected by him is being manufactured.

Chicago Leads in Concrete

Among the cities of the United States, Chicago stands at the head in the number and cost of concrete buildings. Figures gathered by the United States Geological Survey show that in 1909 there were put up in Chicago 519 buildings at a cost of $9,849,800, or 32.31 per cent. of the cost of all concrete buildings erected in the country. Seattle, Wash., ranked second in expenditures for this type of construction.

In stone buildings, Chicago was also the leading city, reporting 83.69 per cent. of all erected, and 57.08 of the cost of these buildings, with an average cost of $7,905. New York was second, with an average cost of $111,617.

More money, however, is still spent on wooden buildings in Chicago than in any other city of the country, the cost of these in 1909 being $13,538,880. San Francisco stood next to Chicago, with a total cost for wooden buildings of $12,257,683.

A Great Subaqueous Tunnel

In a few months an interesting engineering feat will have been accomplished in Hamburg. This is the construction of a gigantic tunnel beneath the river Elbe, which has cost nearly eleven million marks, and has now been in progress for nearly five years. The tunnel, which comprises two tubes 6.06 m. in diameter and 450 m. long, is 6 m. beneath the bed of the river, which in the middle is 10 m. deep where the tunnel crosses. The tunnel ends at the one bank in the suburb of St. Pauli and at the other in Steinwarder, another suburb of Hamburg. The buildings on both sides of the river forming the entrances to the tunnel, with their mighty copper-coated domes and ornamented with reliefs and pillars, will constitute noteworthy sights of the town. At each entrance there are six elevators for pedestrians and vehicles, which operate almost without attendants, the starting, speeding up, slowing down, and stopping all being affected automatically. The power house for the elevators is also situated in the entrance buildings. The excavations for this tunnel were carried out with the aid of compressed air and required considerable engineering skill. The route between the points connected by this tunnel will be diminished by 4.2 kiloms.

Mr. Allan F. Macdonell, who has been for many years a partner in the railway contracting firm of Macdonell & O'Brien, died recently at Frimley Park, Surrey, England, at the age of 55 years. He had been ill for a considerable time, and went to England about two years ago. His wife was the daughter of the late Mr. John Ryan, formerly a contractor of Brockville, Ont.

Trade Notes and Items of Interest

[illegible] being prepared for three sedimentation tanks for the town of North Toronto.

The [illegible] [illegible] Association will hold their annual convention at Brandon, Man., from July 24th to July 28th.

The survey for the new gravity water supply main for the city of Calgary has just been commenced.

At a recent meeting of the Master Builders' Exchange, St. John, N.B., Mr. Robt. Maxwell was elected president and Mr. C. F. Stevens, secretary.

The F. H. McGuigan Construction Company, of Toronto, has been awarded the contract for the construction of the filtration plant for the corporation of Montreal.

The city of Victoria is now in possession of three new fire pumps lately arrived from England to complete the high pressure system that is being installed in that city.

The corporation of Oshawa is progressing with its sedimentation tank project. The successful contractors for this construction are Messrs. Murray & Spencer, Niagara Falls, Ont.

The Canadian Mineral Rubber Company, of Victoria, have installed part of the machinery for their new asphalting plant, and it is expected that they will be in readiness for all demands within a short time.

Peter Lyall & Sons, Limited, Montreal, have secured the contract for erecting a one-storey steel anad cement hockey rink, with seating capacity for 8,500 people, to replace the present rink on Mutual street, Toronto.

Mr. A. B. Garrow has been temporarily placed in charge of the work of construction on the trunk sewer septic tank system, Toronto, to succeed Mr. Blanchard, who resigned to become city engineer of Lethbridge.

After four years of tedious preparation construction work has been commenced on the Coquitlam dam for the British Columbia Electric Railway. The dam will be built of concrete and rock, and will be 800 feet in length, 730 feet wide and 75 feet high.

At an estimated cost of $2,500,000 a dry dock will be constructed at Prince Rupert, B.C. Some 5,000 creosoted piles will be used in the wharf construction. Extensive use will be made of concrete, all the structures to be built on concrete piers resting on bed rock.

Winnipeg census returns show an amazing growth of the city in five years. The final figures have not been determined yet, but returns from districts that are completed show that there will be well up to 200,000 people in Winnipeg, and those suburbs which are virtually a part of the city.

Prince Rupert surveyors are taking soundings for the preparation of plans for floating dry docks at Hays Creek. A Dominion subsidy of three and one-half per cent. and $2,000,000 for twenty years has already been devoted by the Dominion Government to the Grand Trunk Pacific for the work. Operations will commence in a very short time.

The Foundation Company, Limited, Bank of Ottawa Building, Montreal, have been awarded the contract for the reconstruction of Pier No. 4 of the Yamaska River bridge, on the main line of the Quebec, Montreal & Southern Railway at Yamaska, Que. During the spring floods this pier was considerably damaged by ice, rendering its reconstruction necessary.

The dispute over the rate of wages paid in the city of Winnipeg to bricklayers and masons has been finally settled, says a report from the Builders' Exchange. This union has been on the verge of a strike since the opening of the building season. The new agreement provides for an eight-hour day with Saturday a half holiday, the rate of pay to be 67½ cents per hour.

Moose Jaw will soon have an excellent public water works system. The water will be taken from the stream known as Sandy Creek and will give Moose Jaw an ample supply for some years, of pure water good for all domestic and industrial purposes. The investigation, report and recommendation were made by Mr. Walter J. Francis, of Montreal, as consulting engineer.

The partnership of the well-known firm of engineers, Ross & Holgate, has been dissolved, and henceforward the business will be continued under the name of R. A. Ross & Company.

Mr. Henry Holgate, who has been associated with Mr. Robert A. Ross for the past ten years, has joined the Cedar Rapids Power Company, and will take over the control of that concern as president. Messrs. Ross & Holgate, during their partnership, were concerned with the establishment of some of the best known electrical works in the country, notably the Hydro-electric and the West Kootenay Companies. They were also consulting engineers for the Canadian Pacific Railway, and it was under their supervision that the Angus shops were laid out. Mr. Holgate was chairman of the commission which was appointed to investigate the cause of the collapse of the Quebec bridge.

Railway Notes

D. F. MacArthur has been awarded the contract for building seventy miles of grade for the Alberta Central Railway.

The Canadian Northern Railway propose to complete 550 miles of new line in Alberta this year. Steel is being laid at present upon three of the lines under construction.

The new Canadian Northern Railway depot at Brandon, Man., will be finished and open for traffic about August 1st. The contract for the Canadian Pacific Railway depot has been let to the Brandon Construction Company at $60,000 and is to be finished by December.

The Canadian Locomotive Works has been awarded the contract by the Railway Department for the building of five locomotives for the Intercolonial Railway, costing $114,000. The Canadian Car Company secured a contract amounting to $334,800 for box cars, dump cars, etc. The Nova Scotia Car Company are also building one hundred freight cars at a cost of $112,000.

What is estimated to be the greatest task in railway construction since the building of the Canadian Pacific Railway is that of 163 miles of line for the Canadian Northern Railway between Hope and Kamloops. Various contractors are organizing their forces and establishing their construction camps with a view to pushing on the work with all possible speed. The expenditure involved is estimated at from $15,000,000 to $18,000,000. In all, tunnels aggregating over three miles in length will have to be driven. The longest ones are one of 2,000 feet near Yale and one of 2,400 feet near Kamloops Lake.

The Railway Commission at Ottawa has recently issued an important order for the protection of the general public, which states that the railway company shall protect by a watchman any highway crossing at which an accident has happened causing bodily injury or deaht to a person using the crossing, until the board has had the accident investigated and the crossing examined. Another order issued requires all railways to file with the board within sixty days a statement showing the number, class and weight of each locomotive on the line, and whether or not equipped with dump ash pans to avoid the necessity of employees going beneath the locomotives.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Amherst, N.S.

Tenders called for dredging. Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers, Ottawa. Tenders received until 4 p.m., July 25.

Chilliwack, B.C.

Under consideration, purchase of machinery. City Engineer, T. B. Croly. Cement pipe making plant to supply pipe for the new sewerage system. The council are also considering the widening of Yonge street.

Carlisle, Ont.

Tenders called for grading and leveling. Owner, Township of East Flamboro, Ont.; Tp. Clerk, G. Church, Carlisle; engineers, Tyrell & Mackay, 7 Hughson street south, Hamilton. Cutting down of certain hills in sub-division No. 1 East Flamboro near Fireproofing Company's works. Estimated amount of material to be moved, 3,000 cubic yards. Plans, etc., at office of engineer. Tenders received by secretary until July 27.

Gravenhurst, Ont.

A by-law will be submitted on Aug. 5 for the raising of $7,000 to erect a steel water tank.

London, Ont.

Tenders called for waterworks. Owner, Waterworks & Electrical Department, City of London. General Superintendent, H. T. Glaubitz, London. 3,300 feet 18-in. and 1,600 feet 12-in. c.i. pipe, with valves and specials. For specifications, etc., write superintendent. Tenders received until noon, Aug. 12th.

Moncton, B.C.

Tenders called for reservoir dam, $50,000. Owner, City of Moncton; engineer, John Edington, Moncton. Dam 50 ft. high, 800 ft. long. Materials required, gate house of cement, concrete tunnel, c.i. pipe, reservoir capacity, 270,000,000. Tenders called until July 27.

Milton, Ont.

Tenders called for arch and viaduct. Middle road, between Oakville and Tp. of Trafalgar. County Clerk, Wm. Panton, Milton, Ont; consulting engineer, E. Barber, 57 Adelaide street east, Toronto. Construction of reinforced, concrete arch, 135 ft. span and 340 ft. concrete viaduct approach. Plans, etc., at office of engineer. Advertisement in "Tenders and For Sale Department" of this issue.

Montreal, Que.

Tenders received for sewers, Highland avenue. Owner, City of Montreal. Engineer, Geo. Janin. Brick, 2 ft. by 3 ft. Tenders closed July 20th.

North Vancouver, B.C.

Engineer's report of waterworks, etc. City engineer, G. S. Hanes. The engineer reported the required supply of 10,000 feet of 8-in. and 10-in. c.i. main pipe; constructing of a 16-in. main across 17th street; also widening of 4th street.

New Westminster, B.C.

Tenders called for sewer pipe, west end. Owner, City of New Westminster, B.C.; city clerk, W. A. Duncan; engineer, J. W. Blackman, City Hall, New Westminster. Tenders for laying twelve miles sewer in west end, manholes, ets., close July 24th.

New Glasgow, N.S.

Tenders called for dam, Forbes Lake. Owner, Municipality of New Glasgow, N.S.; clerk and treasurer, J. Roy, New Glasgow; engineer, C. A. Mitchell, Bank of New Brunswick Building, New Glasgod. Labor and material for concrete and earth dam, about 300 ft. long, and 25 feet high. Specifications at office of C. A. Mitchell. Tenders received by engineer until 3 p.m., July 25.

Outremont, Que.

Tenders called for sewers. Owner, Town of Outremont; acting secretary-treasurer, F. Schofields. About 1,785 lin. yds. of 2 x 3 brick sewers. Plans, etc., at office of town engineer. Tenders received until July 19th by secretary-treasurer.

Ottawa, Ont.

Machinery required for waterworks. Owner, city of Ottawa; engineer, N. J. Ker, Ottawa. One spur gear. Tenders received by secretary waterworks committee until August 1st.

Port Arthur, Ont.

Tenders called for storage dam, Current River Park. Owner, City of Port Arthur; city clerk, J. McTeigue. Completion of the service reservoir dam. Plans, etc., obtained from city engineer. Tenders received until 6 p.m., July 25, by city clerk. Advertisement in "Tenders and For Sale Department" of this issue.

Qu'Appelle, Sask.

Tenders called for drain, northwest from here. Owner, Department of Public Works, Regina. General contractor, Foote. 30,000 cubic yards to be removed. Tenders received by F. I. Robinson, Department Public Works, until August 1st.

Quebec, Que.

Tenders to be called for waterworks, $700,000. Owner; city of Quebec; city engineer, W. D. Baillarge, Quebec. miles cast iron pipe, new main, 40 in. Tenders will be called shortly.

Raymond, Alta.

Proceeding of council, waterworks extension. General contractor, W. I. Gray, Minneapolis, Minn. The council sanctioned the raising of loan of $10,000. A reservoir is to be constructed.

Sudbury, Ont.

Waterworks extension. A by-law will be submitted on the 31st July to raise the sum of $15,000 for the extension of the waterworks system.| T. Godfrey, clerk.

Toronto, Ont.

Proceedings of board of control, intake pipe, $259,900. City Clerk, W. A. Littlejohn; city engineer, C. H. Rust; city engineer will report on the tender of Miller, Cummings & Robertson for laying intake pipe.

Tenders called for paving. Owner, City of Toronto; chairman of board of control, G. R. Geary. Asphalt bitulithic, and concrete pavement; grading; concrete curbs; concrete walks. Tenders received by chairman until noon, August 1st.

Toronto, Ont.

Tenders called for macadam highway. Owner, York County Board of Highway Commissioners; chairman, R. T. Bull; secretary, J. A. Ramsden; engineer, E. A. James, Room 6, 57 Adelaide street east, Toronto. .Supply of machinery, material, labor and construction of (a) Lake Shore road; (b) Weston road; (c) Vaughan road; (d) Kennedy road; (e) Kingston road; (f) Dundas street. Specifications at office of engineer. Tenders received by board until July 29. Advertisement in "Tenders and For Sale Department" of this issue.

Tenders called for main drainage. Owner, city of Toronto; G. R. Geary, chairman of board of control. Construction of low level interceptor, Don Syphon (crossing under River Don); also manufacture and delivery of the following: 280 ft. 30-in. c.i. pipe; 5,984 ft. 42-in. 1,985 ft. 30-in., and 2,315 ft. 36-in. reinforced concrete pipe. Plans, etc., obtained from main drainage works, City Hall. Advertisement in "Tenders and For Sale Department" of this issue.

Vancouver, B.C.

Tenders called for pavement and curb. Owner, City of Vancouver, B.C.; W. McQueen, city clerk. About one mile cement concrete curb, asphalt pavement on 10th Ave., creosoted wood block pavement; Dunley ave. and Broadway, bitulithic pavement with stone blocks in the tracks on Park Drive. Tenders received by city clerk until July 25th.

CONTRACTS AWARDED

Maisonneuve, Que.

Sewage, $65,000. Owner, Corporation of Maisonneuve; engineer, J. E. Vanier, 5 Beaver Hall Square, Montreal, Que; general contractor, Harris Construction Co., Ltd. Brick and steel pipe required. Contract awarded July 17th.

Oshawa, Ont.

[illegible]

consulting engineer, T. Aaird Murray, C.E., Lumsden Bldg., Toronto; town engineer, Frank Chappel, Oshawa; successful contractor, Messrs. Murray & Spencer, Niagara Falls, Ont., $6,248. [illegible] opened July 11th.

Toronto, Ont.
Pumping Station. The contracts for the erection of a pumping station by the city of Toronto on Eastern avenue have been awarded as follows: Lathing and plastering, M. Hutchinson, $1,337; roofing, George Sinclair, $293; carpentry, M. Hutchinson, $1,208; masonry, Wm. Forbes & Sons, $25,990; painting and glazing, H. W. Johnston, $278; plumbing, Fred Armstrong Co., Ltd., [illegible]

Railroads, Bridges and Wharves

Brandon, Man.
Work in progress for depot, $60,000. Owner, Canadian Pacific Railway; general contractor, Brandon Construction Co., Brandon. Three storeys, brick and stone. Heating and plumbing not awarded.

Calgary, Alta.
By-laws carried for engineering, $55,000, for cement substructure and bases for street railway extensions.

County of York, Ont.
Tenders to be called for bridge, over Don River, Lot 6, Con. 2. Owner, County of York; engineer, Frank Barber, 57 Adelaide street east, Toronto. Fifty-foot span, reinforced concrete arch. Tenders received until July 31.

Dartmouth, N.S.
Plans being prepared for ferry entrance, $20,000, George street, Halifax. Owner, Dartmouth Ferry Commission, Dartmouth. One storey, 60 x 40, wood, electric lighting, cement work, brick, sky lights, electrical work, electric bells, plate glass. Tenders to be called as soon as plans have been approved by city engineer of Halifax. The ferry dock will also be rebuilt.

Fort Frances, Ont.
Tenders called for station. Owner, Canadian Northern Railway; architect, R. B. Pratt, 289 Garry, Winnipeg. Three storeys, 116 x 24, brick, concrete foundation, steam heating, electric lighting, shingle roofing, interior finish hardwood, cement, cut stone, brick, tile, metallic lath, structural iron, sheet metal, pipe covering, electrical work, electric bells, shingle stain, steel beams, plate glass. Tenders received at Winnipeg, Fort Frances, Fort William and Port Arthur, until July 22.

Guelph, Ont.
Tenders called for bridge, over River Speed, Neeve street. Owner, City of Guelph; T. J. Moore, clerk; Acting City Engineer, L. Malcolm. Construction of concrete arch bridge (two 40-ft. spans) approximate amount of concrete, 385 cubic yards. Plans, etc., at office of city engineer or Contract Record, 220 King street west, Tordnto. Tenders received until July 29th, by city clerk.

Golden, B.C.
Tenders to be called for bridge, $50,000. Owner, department of public works, Victoria, B.C. Engineer, J. E. Griffiths, public works engineer, Victoria. New swing bridge across Columbia river, 42 miles south of Golden, to provide facilities for settlers of Windermere district. Tenders are erpected to be called this month; also for construction of bridge at Trail.

Grand Falls, N.B.
Supplies needed for round house, $100,000. Owner, Grand Trunk Pacific Railway, Montreal. Contractors, Power & Brewer, Grand Falls, N.B. Building supplies required.

Moncton, N.B.
Contemplated, bridge, $30,000, St. George street. Owner, Intercolonial Railway, Moncton; engineer, W. B. McKenzie, Moncton. One span, 200 feet, 40 feet width, concrete, abutments iron. Work to commence soon, to be built by day labor.

A preliminary survey has been started by the I. C. R. engineering department for a subway under the northern railway crossing on upper Main street. Work will be started shortly.

The Moncton Tramway, Electricity and Gas Company are to start laying pipe from their natural gas wells in Albert County during the week commencing July 17. About a mile of the trench has been dug. The entire pipe line will be completed in eight weeks.

Tenders called for freight shed. Owner, Dept. of Railways and Canals, Ottawa; secretary, L. K. Jones. Construction of freight shed on the quay wall. Plans, etc., at office of chief engineer, Dept. of Railways & Canals, Ottawa; chief engineer, I. C. R., Moncton, N.B., at office of Board of Trade, Halifax. Tenders received by secretary until noon, August 1, 1911.

Prince Rupert, B.C.
Plans being completed for dry dock. Official in charge, T. H. Pillsbury; resident engineer G. T. R., Prince Rupert. 5,000 creosoted piles to be used for wharf construction. Extensive use will be made of concrete, all the structures to be built on concrete piers resting on bed rock. Estimated cost, $2,500,000.

Sudbury, Ont.
Improvement of Streets. A By-law will be submitted on the 31st of July for the raising of $46,500 for the improvement of streets and $35,000 for the erection of a bridge over Nolan's Creek. T. J. Godfrey, clerk.

Saskatoon, Sask.
Proposition accepting the proposition of Evans Syndicate for the street railway and power plant.

St. John, N.B.
Department of Public Works of Canada are shortly to call for tenders for 1,900 feet of wharf at Sand Point, St. John. Specifications are being printed; details are not available.

Tenders called for miscellaneous work. Owner, City of St. John; city engineer, W. Murdoch. Replacing of Rodney wharf, West St. John. Sewer excavation, backfill and cartage in designated streets. Water pipe excavation. Laying of asphalt sidewalks in designated streets. Cash deposit with each bid and tenders to be addressed to Common Clerk, Room 3, City Hall. Tenders to close August 1st.

Tp. of North Dorchester, Ont.
Tenders called for bridges. Owner, County of Middlesex; W. B. Lane, Tp. Clerk. Two concrete bridges. Plans and specifications at county engineer's office, county buildings, London. Tenders received by Tp. Clerk until July 31.

Toronto, Ont.
Work in progress for extension to freight sheds, $4,156, Front and Cherry streets. Owner, MacKenzie, Mann & Company, 1 Toronto street, Toronto. One storey, 164 ft. 6 in. x 38 ft., mill construction, sheeted with galvanized iron, cedar posts, electric lighting, felt and gravel roof. Work will be done by day labor.

Vancouver, B.C.
Tenders to be called for wharf and freight shed, $400,000, west of Sugar Refinery. Owner, The Great Northern Railway. Wharf, 800 x 148, freight shed, 1,008 wide, creosoted piling and modern machinery for handling cargo will be installed. Tenders will be called shortly. Construction will probably start in about five weeks' time.

Victoria, B.C.
Sea Wall. Tenders will be called shortly for the building of the Ross Bay Sea Wall. Plans have been prepared by Cecil B. Case, engineer, and it is understood that specifications will be based upon these.

CONTRACTS AWARDED

Churn Creek, B.C.
Suspension bridge, Lillooet District. Contractor, C. Gardiner Johnson & Co., Vancouver. Contract includes galvanized crucible steel wire cable and accessories. Amount of cable to be used, 485 feet 1½ in., 3,438 ft. 2⅜ in. 1,141 ft. 1¾ in. and 320 ft. 1¼ in.

Millbank, Ont. (3 miles south)
Bridge. Owners, Perth & Waterloo Counties; engineers, Bowman & Connor, Berlin, Ont. Successful contractor, J. B. Lichty, Wellesley, Ont. Construction of concrete abutments at $5.50 per cubic foot.

Prince Rupert, B.C.
Tunnel, mile 44. Owner, Grand Trunk Pacific Railway. Contractor, Foley, Welch & Stewart; engineer in charge, C. G. Van Arsdol, Hazelton, B.C., 1,600 feet long. Work is to be rushed to permit main line of G. T. R. to use tunnel by next winter.

Raleigh, Ont.
Bridge, Tp. of Raleigh and Government Drain No. 2. Owner, County Council; engineer, W. G. McGeorge, Chatham. Span 30 feet each, concrete and steel foundation. Contractor, A. S. Everitt, Thamesville, Ont.

Toronto, Ont.
Railroad. Owner, Canadian Northern Railroad. Contractors, Foley Bros., St. Paul; Northern Construction Company, Winnipeg.

Whiteman's Creek.
Bridge, $3,400, 2½ miles northeast of Burford Village. Owner, County of Brant; A. E. Watts, clerk, Court House, Brantford; engineer, W. H. Fairchild, Brantford; general contractor, H. Vanderlip, Cainsville, Ont. Reinforced concrete girder bridge, two abutments, centre pier, two clear spans of 40 feet each. Expanded metal for boor, Kahn bars for girders. Cement supplied by county.

Public Buildings, Churches, Schools, etc.

Belleville, Ont.
New tenders called for two schools. Owner, board of education, Belleville;

secretary, W. T. Diamond; architect, R. Ellis, Manning Chambers, Toronto. Erection of two schools. Plans, etc., at office of secretary or architect. Tenders received by secretary until July 27.

Chatham, Ont.
Owner, board of education, Chatham; architect, Jas. L. Wilson, Chatham. Two storeys and basement, 70 x 90, 8-room, brick and frame, stone foundation, direct-indirect heating, electric lighting, gravel composition, hard wall plaster, interior finish, cut stone, terra cotta, tile, armored concrete, reinforced concrete, artificial stone metallic lath, structural iron, ornamental iron fire escapes, cornice pipe covering, electric work, electric bells. Tenders received until July 29.

Chippewa, Ont.
Tenders called for school, $15,000. Clerk, W. Myers, Chippewa; architect, C. M. Borter, Niagara Falls, Ont. Tenders received until August 1st by Thos. Flommerfelt, secretary public school board, Chippewa.

Dundas, Ont.
Tenders called for public building. Owner, Department of Public Works, Ottawa; R. C. Desrochers, secretary. Plans, etc., on application to Thos. A. Hastings, Postal Station F, Yonge st., Toronto, local post office and at the department. Tenders received until 4 p.m., August 8, by secretary.

Fort William, Ont.
Grandstand. The West Algoma Agricultural Association will erect a $5,000 grandstand on the Agricultural Grounds. Carl Wirth, architect. Tenders called on the 7th and closed on the 8th.

Galt, Ont.
Y. M. C. A. Building. The directors have decided to purchase the Grand Hotel property on Queen's Square, as a site for the new Y. M. C. A. building, $18,000. The property comprises 105 x 366. Plans will be prepared immediately and tenders will be let without delay.

Hamilton, Ont.
Addition to Hospital. A by-law will be submitted on July 25th for the raising of $22,873.33 for the purchase of property adjoining City Hospital for hospital purposes. S. H. Kent, city clerk.

Hamilton, Ont.
Tenders called for school, Caroline street. Owner, board of education; secretary, R. H. Foster; architect, Munro & Mead, Main and Hughson streets, Hamilton. Installation of heating and plumbing fixtutres. Plans, etc., at office of the architects. Tenders received until July 22nd by secretary. Plumbing includes installing new lavatories.

Lethbridge, Alta.
Work delayed for church, $80,000, cor Fourth ave. and Tenth street. Owner, St. Patrick Roman Catholic Church. Tenders received, too high, lowest in neighborhood of $150,000. No contract awarded. Doubtful if anything further will be done this year.

New Westminster, B.C.
Contemplated, Y. W. C. A. Building, Sixth and Seventh streets. Building Committee, Mrs. Maxwell, Mrs. Ferguson; secretary, Mrs. De Pencier. Site given; canvas for funds to be started. It is proposed to construct the basement of the new building this year.

School. Plans have been prepared by Gardiner, Mercer & Gardiner for a new school on the north side of Sixth ave. Two months allowed for clearing site, etc.

Addition to Penitentiary. The new wing contemplated for the penitentiary will provide accommodation for about 260 prisoners and will be of brick and stone. Architect, E. J. Adams. Inspector of Prisons, G. W. Dawson.

Nelson, B.C.
Enlargement to School. The school trustees are contemplating the enlargement of the school in the Hume School District.

Nanaimo, B.C.
Proposed extensions to club building, $15,000. Owner, Athletic Club; architect, A. Forrester, Nanaimo. Accommodation includes provision of swimming tanks, Turkish baths, gymnasium, reading rooms, etc. Plans will be ready shortly.

Pembroke, Ont.
Tenders called for library, $13,000. Owner, Coroporation of Pembroke, Ont.; Town Clerk, A. J. Fortier; architect, F. C. Sullivan, Bank of Ottawa Building, Ottawa. Reinforced concrete, brick, Kahn system of reinforcement. Tenders received by J. H. Reeves, secretary, until July 24.

Stratford, Ont.
Proceedings of council, public building. City clerk, R. R. Lang. The council authorizes raising of $5,000 debentures for new ventilation and heating for Collegiate Institute. A by-law to raise the sum of $12,000 for erection of an abattoir was given its first reading.

St. John, N.B.
Tenders called for mortuary chapel, Fernhill cemetery; architect, G. Ernest Fairweather, St. John, N.B. Erection of mortuary chapel and receiving tomb. Superintendent Clayton of the cemetery has lately visited Montreal, Boston and other cities. Tenders received by architect until July 26th.

Revelstoke, B.C.
Tenders called for post office and government offices. Owner, Department of Public Works, Ottawa; R. C. Desrochers, secretary; architect, Thos. Henderson, New Westminster, B.C. 2 storeys, 46 x 68, concrete, stone and brick, concrete foundation, hot water heating, electric lighting, gravel roof, interior finish, hardwood, cement, cut stone, marble, brick, tile, mantels, reinforced concrete, metallic lath, sheet metal, metal ceiling, roof or siding, cornice, skylight, fireproof doors and windows, electrical work, telephone system, ornamental columns and caps, plastic relief work, plate glass. Tenders closed July 24.

Plans prepared for theatre. Owner, Hugh Calder; architect, F. Neil Brodie, St. John, N.B. 49 x 108. Private tenders to be invited.

Sherbrooke, Que.
Tender to be called for office, $1,000. St. Francis street. Owner, Colgenest & Fils; architect, L. N. Audet, Sherbrooke. Three storeys, reinforced concrete and brick, concrete foundation, electric lighting, cement, brick, vaults. Tenders called after July 22.

Tilbury, Ont.
Tenders called for public building. Owner, Department of Public Works, Ottawa; R. C. Desrochers, secretary; engineer, H. J. Lamb, London, Ont. Plans, specifications, etc., may be obtained at the office of the engineer, post office, Tilbury, and at the department of public works, Ottawa. Tenders received until 4 p.m., August 8, by secretary.

Toronto, Ont.
Work in progress for school, $11,000. 53 St. Clair avenue. Owner, Havergall College, 53 St. Clair avenue, Toronto. Architect, Wickson & Gregg, 59 Yonge street, Toronto. Two storeys, 32 x 45, brick, cement foundation, shingle and galvanized iron roofing, steel beams.

Equipment required for boiler house, $6,000, Victoria, street. Owner, Sisters of St. Joseph, Bond street, Toronto; architect, A. A. Post, 15 Toronto street, Toronto. Three boilers and valve pumps required. Tenders for construction all closed.

Victoria, B.C.
Tenders called for school. Owner, Department of Public Works. Tenders are called until July 31st, for a large one-room frame school at Columbia Gardens, Ymir District, also for one small one-room school at Long Lake, Kamloops District, until August 4th.

Vancouver, B.C.
Proposed work on two fire halls. Owner, City of Vancouver, B.C.; city clerk. Committee appointed to select sites comprises Ald. Williamson, Chief Carlisle, etc. City Electrician was instructed to report on electrical equipment for the new sub-stations to be built in the city.

Plans prepared for addition to high school, $125,000, Parker street and Colton Dr. Owner, Board of Education; secretary, C. W. Murray. Addition of 12 rooms with auditorium, reinforced concrete. Tenders called shortly.

Whitby, Ont.
Contemplated, addition to Ladies' College, $80,000. Owner, Education Department, Methodist Church, Richmond street, Toronto. Rev. T. Graham, D.D., secretary; Prof. Hare, Principal Ladies' College. Only two wings will be erected at present, costing about $30,000. Three storeys and basement, including gymnasium, isolated hospital, etc.

CONTRACTS AWARDED

Fort William, Ont.
The contracts have been awarded as follows for school on Miles street: painting, Robertson & Cantwell, Fort William; plumbing, Superior Heating & Plumbing Co., Fort William.

Fredericton, N.B.
Contract to be awarded for restoration of Cathedral. Owner, Christ Church; architects, Delaney Robinson, New York, care Bishop Richardson Fre. Members Building Committee, Bishop Richardson; Very Rev. Dean Schofield, Cannon Neals, and Dr. T. C. Allen. Estimated cost $75,000. Insurance [illegible]. The contract for repairs is expected to be signed shortly with Moses Mitchel, contractor, Fredericton.

Hope, B.C.
Lockup and government office. Donald J. Macrea, Victoria, has been

awarded contract for the erection of lock-up and government offices by the Provincial Government.

Leduc, Alta.

The contract for the building of the new school at Leduc has been awarded to Mr. Wm. Deitz, of Calgary.

Newdale, Man.

[illegible] [illegible] Owner, Municipality [illegible] Newdale; secretary-treasurer, Johnson; architect, W. A. Elliott, Brandon, Man; general contractor, R. Willioughby, Brandon. One storey, brick and stone, 64 x 36. Muller hot air heating, pitch roof. As far as can be learned [illegible] will be [illegible] as about

Welland, Ont.

The contracts for the erection of the new 8-room public school in the south part of the town have been awarded as follows: Masonry, W. S. Homan, Niagara Falls; carpentry, metal and painting, J. E. Cutler, Welland; electric wiring, Frank Clifford, Welland; plumbing and heating, J. H. Crow, Welland.

Toronto, Ont.

Excavation. Government House, Toronto. Owner, Provincial Government; secretary, W. D. McNachten; contractor, Thomson Bros., Toronto.

Vancouver, B.C.

Two schools. Owner, Board of Education; architect, J. H. Bowman, Crown Building, Vancouver; general contractor, Herrett & Co., 1029 Westminster avenue, Vancouver. One at Rosenburg road, $29,369; other at 43hr street, $29,934. Two storeys, 108 x 64, brick and stone.

Wolfville, N.S.

Post office and custom house, $40,000. Owners, Dominion Government, Ottawa; O. Ewart, architect, Ottawa; general contractor, A. Hood, Shelburne, N.S. Saskville stone and Avonport brick, Hantsport stone foundation, hot air heating, electric lighting, felt roof, fire escapes, cornice, roofing paper. Work to start in ten days; finish, 1912.

Residences

Fort William, Ont.

Tenders called for residence, $4.000, Arthur and Norah. Owner, Jas. A. Davidson, Fort William; architect, R. E. Mason, Fort William. Three storeys, brick veneer, concrete foundation. Tenders called until July 18th.

Halifax, N.S.

Plans being prepared for four dwellings, $25.000. Owner, Halifax Realty Co.; J. W. Regan, president, Carlton Place, Halifax; architect, A. G. Gates, the Nova Scotia Telephone Bldg., Halifax. Plans and specifications will be ready in a fortnight.

Moncton, N.B.

Tenders called for parsonage, Queen street. Owner, Trustees of the Central Methodist Church; secretary, F. A. McCully; architect, F. Neil Brodie, St. John. Plans and specifications at office of Mr. I. W. McAnn, Queen street, Moncton, and with the architect. Tenders closed July 25.

Montreal, Que.

Residence. Alf. Gravel, 12 St. Hubert street, will erect a $5,000 residence at 96 Marie Anne street, two storeys, 30 x 66, brick, stone foundation, brick, tile, mantels, cornice, electrical work, electric bells, plate glass.

Residence. O. Michand, 1152 Rachel, will erect a $6,000 residence at 152 Delorimier, three storeys, 49 x 50, brick, stone foundation, brick, tile, mantels, electrical work, electric bells, plate glass.

Residence. Mr. Ouilette, 307 Delisle street, will erect a $6,000 residence at 339 Fabre street, three storeys, 29 x 50, brick, stone foundation, hot water heating, electric lighting, brick, tile, mantels, ornamental iron, cornice, telephone system, electric bells, plate glass.

Tenders closed for residence, $7,000, Harvard avenue. Owner, City Realty Investment Co., 92 Notre Dame street, Montreal, private plans. Two storeys, brick and stone foundation, cement work, cut stone, steel beams, hot water heating, electric lighting, tile, mantels, ornamental iron electrical work, telephone system, plastic relief work, plate glass. Tenders closed July 15.

North Vancouver, B.C.

Work in progress for apartment house and stores, $12,000. Owner, North Vancouver Improvement Company, Vancouver; architect, Wm. F. Gardiner, 347 Pender street, Vancouver. Two storeys, 50 x 70, brick, concrete foundation, heated by flues, electric lighting, tar and gravel roofing, cement, brick, tile, mantels, structural iron, electrical work, plate glass.

Revelstoks, B.C.

Tenders closed for apartment house, $25,000. Owner, H. F. McKinnon, Revelstoke; architect, John Dunn, Revelstoke. Two storeys, 40 x 90, brick and stone, concrete foundation, cement work, reinforced concrete, metal ceiling, metallic lath, steel beams, iron columns, plastic relief work, hot water heating, electric lighting, metal roof, bowling alley in basement, boiler house, etc. Tenders closed July 13,

St. John, N.B.

Plans to be prepared for rectory, north end. Owner, St. Lukes Anglican Church; architect, G. E. Fairweather, Germain street, St. John. Plans to be prepared at once.

Strathcona, Alta.

Work in progress for four residences, $4,000 each. Owner, Alberta University; architect, Wilson & Herald, Strathcona; general contractor, McSporren & Co., Strathcona. Three storeys, 36 x 50, brick.

Toronto, Ont.

Tenders to be called for three attached residences, $4,500; north side Melville avenue. Owner, H. W. Sharpe, 19½ Adelaide street east, Toronto; architect, J. Hunt Stanford, 34 Yonge Street Arcade, Toronto. Two storeys, 40 x 44, frame, braick foundation, hot air heating, combination lighting, open plumbing, shingle roofing, interior finish pine, cut stone, brick, mantels, electrical work, electric bells, shingle stain, plate and art glass. Tenders received after July 20.

Work in progress for dwelling, $7,000, Russell Hill road. Owner, Alex. H. Rodgers, 12 Wellington street east, Toronto. Architect, Wickson & Gregg, 59 Yonge street, Toronto. Two and one-half storeys, 36 x 40, brick, stone foundation, hot air heating, electric lighting, shingle roof, hardwood interior finish, cement work, cut stone, tile mantels, metallic lath, cornice, electrical work, shingle stain, steel beams, plate and art glass.

Residence. W. E. Tweedy, 434 Parliament street, will erect a $3,000 residence at s. s. Glendale avenue, two and one-half storeys, 43 x 18, brick, stone foundation, shingle roofing.

Pair dwellings. N. Cooper, 100 Humberside avenue, will erect a two-storey residence at 26 Hickson avenue, brick, stone foundation, shingle roofing.

Work in progress for two pair semi-detached residences, 69-73 Duggan avenue. Owner, H. E. Simpson & Company, Delaware avenue, Toronto; architect, Thos. Harris, 43 Howard Park avenue, Toronto. Two and one-half stys., 33 x 42, brick and stone, stone foundation, hot air heating, combination lighting, open plumbing, shingle roofing, cut stone, brick, tile, mantels, cornice, electrical work, plate glass. Owner will build by day labor.

Tenders to be called for one pair dwellings, $4,000, Shaw street. Owner, Taylor & Grosvenor, 789 Shaw street, Toronto. Two storeys, 48 x 34, brick, brick foundation, hot air heating, combination lighting, open plumbing, shingle roof, brick, tile, mantels, cornice, electrical work, electric bells, shingle stain, plate glass. Tenders will be asked for heating, lighting and plumbing in about four weeks.

Work in progress for three residences, $6,000, 357-61 Grace street. Owner, J. W. Brown, 229 Christie st., Toronto; architect, R. H. Finney, 43 Victoria street, Toronto. Two and one-half storeys, 29 x 47, brick, stone foundation, hot air heating, combination lighting, shingle, felt and gravel roofing. Work to be done by day labor.

Work in progress for pair dwellings, $5,000, 45 Duggan avenue. Owner, H. E. Simpson, Delaware avenue, Toronto; architect, Thos. Harris, 43 Howard Park avenue, Toronto. Two and one-half storeys, 42 x 33, brick, stone foundation, hot air heating, combination lighting, shingle, felt and gravel roof. Work will be done by day labor.

Tenders called for residence, $4,000, Brunswick avenue. Owner, Dr. Slade, Toronto; architect, H. Bryan Gilbert, 47 Wellington street east, Toronto. 2½ storeys, brick, brick foundation, hot water heating, gas and electrict lighting, slate roof. Hardwood interior finish, mantels, plate glass. Tenders called by architect for all tardes until July 28.

Tenders to be called for two residences, $30,000, 95 Castle Frank road. Owner, W. A. Noble, Hamilton; architect, W. J. Peppiatt, 329 Carlton street, Toronto. Two and one-half storeys, 34 x 50, brick, stone foundation, hot water heating, electric lighting, shingle roofing, cut stone, marble, brick, tile, mantels, skylights. Tenders will be called for everything but masonry by architect within a week.

Tenders called for dwelling, $3,800, 28 Walter street. Owner, D. H. Atkinson, 12 Walter street, Toronto; architect, J. H. Galloway, 23 Toronto street, Toronto. Two and one-half storeys, 44 x 42, brick and stone, stone foundation, hot water heating, electric lighting, open plumbing, shingle roofing, interior finish hardwood. Owners open for tenders for about a week.

Tenders to be called for pair dwellings, $4,300, Beresford avenue west, Toronto. Owner, McIntosh, Bradshaw, Stinson & Moore, 328 Brunswick avenue, Toronto. Two and one-half stys., brick, stone foundation, hot air heating, electric lighting, open plumbing, shingle roofing, cut stone, tile, mantels, plate glass. Tenders will be called on everything but carpentry and will be open for a few weeks.

Dwellings. Arthur Edmonds, 157 Symington avenue, will erect pair semi-detached dwellings on the east side of Pauline avenue, two and one-half stys., 32 x 41, brick, stone foundation, shingle, felt and gravel roofing.

Work in purogress for dwelling, $5,000, Dalton road. Owner, J. G. Near, Dalton road, Toronto; architect, Thompson & Belfry, 43 Victoria street. Two storeys, 31 x 29 ft. 6 in., brick and stone, brick foundation, hot water heating, electric lighting, slate roof, interior finish Georgia pine, cut stone, brick, tile, mantels, cornice, shingle stain plate glass.

Work in progress for five bungalows, $17,500, Pleasant boulevard. Owner, Britnell & Richards, 186 Bedford road, Toronto. Two and one-half storeys, 22 x 34 each, brick, stone foundation, hot water heating, electric lighting, shingle roof, cement work, cut stone, brick tile, mantels, cornice, electrical work, electric bells, shingle stain, plate and art glass. Work will be done by day labor.

Vancouver, B.C.

Residence. Plans have been prepared for a $12,000 residence to be erected by G. H. Cottrell, tenders for which are now being called.

Residence. Plans have been prepared by Claude P. Jones, architect, for a $12,000 residence to be erected by G. H. Cottrell, tenders for which are now being called.

Tenders to be called for apartment house, Bridge and Eighth avenue. Owner, Mr. Mathews, Cumberland, B.C.; architect, Wm. F. Gardiner, 347 Pender street, Vancouver. Two storeys, 80 x 80, brick and mill construction, concrete foundation, heated by flues, first class cement, marble, brick, tile, mantels, fireproofing, structural iron, cornice, skylights, fireproof doors and windows, electric work, telephone system, steel beams, plate glass, art glass. Tenders to be received after July 24th.

Winnipeg, Man.

Work in progress for residence, $7,000, Ethelbert street. Owner, Dr. Raymond Brown, Somerset Bldg., Winnipeg; architect, C. E. Bridgman, Winnipeg. Two and one-half storeys, stone and frame, stone foundation, hot water heating, electric lighting, shingle roof, hardwood interior finish.

Tenders called for apartment block and stores. Owner, A. Congdon; architect, J. D. Atchison, Bank of Toronto Bldg., Winnipeg. Tenders for the general work and for plumbing and heating will be received by the architect until noon, July 24.

Tenders called for apartment block, $55,000, Langside near Armstrong's Pt. Owner, C. L. Stanwood, Winnipeg. Architect, Paul M. Clemens, Brown Block, Winnipeg. Three storeys and basement, brick and stone, stone foundation, steam heating, electric lighting. Tenders closed July 22.

CONTRACTS AWARDED

Brantford, Ont.

Priest's residence, Palace street, $10,000. Owner, Roman Catholic Church, Rev. Dean Brady, Brantford. architect, Robt. Clohesy, 236 James street south, Hamilton, Ont.; general contractor, Hewson & Wright, Brantford. Two and one-half storeys, 40 x 40, hot water heating, electricity and gas, slate roof, hardwood and Georgia pine finish. Heating, plumbing and plastering contracts not let yet.

Hamilton, Ont.

Residence, Fairmount avenue, $4,000. Owner, W. Aitchison, Queen street S., Hamilton; architect, J. A. Armes, Fed eration Life Bldg., Hamilton; general contractor, R. Tope, 191 Robinson st., Hamilton. Two storeys, 45 x 40, brick and stone, hot water heating.

Montreal, Que.

Dwelling. The contract has been awarded to John Wighton for a two-storey brick and wood dwelling to be erected by K. E. Thorne at Cote des Neiges Road. Saxe & Archibald, Beaver Hall Hill, architects.

Residence, Pine avenue, $25,000. Owner, Bank of Montreal; architect, R. Findlay, Beaver Hall, Montreal; general contractor, J. H. Hutchison, 64 St. Ambroise street, Montreal Three storeys, 45 x 46, brick and stone, stone foundation, hot water heating, electric lighting, oak interior finish. Tenders closed July 14.

Renfrew, Ont.

Residence. The contract for the erection of a $3,000 residence by J. R. Durbrow was awarded on July 2nd to J. A. Jamieson, Renfrew.

Toronto, Ont.

Residence. The contracts for the $8,000 residence to be erected by Mrs. Armour have been awarded as follows: Masonry, W. J. Glenister, 161 Macpherson acenue; carpentry, 296 Westmoreland avenue; plastering, F. W. Goulding, Balloil street; heating and plumbing, P. N. Huffman, 30 Cowan avenue, decorating, W. M. Weeks, 43 Richomnd street east; tiling, G. L. Robinson, 556 Delaware avenue.

Business Buildings and Industrial Plants

Alberto, P.E.I.

Machinery for sale for mill. Owner, George Gard. Rotary mill, 10-in. four-sided moulders, surface planer, buzz plane, bandsaw, table sand papering machine, foot power mitreing machine, 25 h.p. engine and 40 h.p. boiler.

Aylesford, N.S.

Contemplated, canning factory. Owner, Robert Simpson Co., Halifax, N.S. To be built this fall or next spring.

Qu'Appelle, Sask.

Proposed construction of flour and grist mill. Party interested, D. Moore, S. Qu'Appelle, Sask. Capacity of mill, 100 bbl.

Amherst, N.S.

Probable extension for factory. Owner, Canada Car Co., Montreal, Que.; president, N. Curry. Mr. Curry has announced that if land adjacent to the Amherst plant can be acquired at a reasonable figure a large extension may be built at an early date. Work is plentiful and he desires to increase the passenger shed 50 per cent.

Bradenbury, Sask.

Plans in progress for store, $12,000. Owner, Walton Bros., Bradenbury, Sask.; architect, W. A. Elliott, Brandon, Man. Two storeys, 30 x 50, brick, cement work, hot air heating, oil lighting, flat roof, B. C. fir interior finish. Two stores on ground floor, apartment suites above.

Chatham, Ont.

Contemplated, addition to bakery. Owner, Palmer Bros., Chatham. Tenders for this will be called in the early fall.

Edmonton, Alta.

Hotel. Tenders have been called for the construction of an hotel at the corner of Namayo and Rice street by Northern Hotel Company, three storeys, frontage 75 feet, cost $100,000; architect, R. W. Lines, Molson's Bank Bldg., Edmonton.

Guelph, Ont.

Plans revised for Wellington Hotel. Owner, Winter Fair Board; president, John Bright, London; secretary, A. P. Westervelt; architect, W. A. Mahoney, Guelph. Tenders will be called shortly. J

Hamilton, Ont.

Contemplated purchase of storage tank. Owner, City of Hamilton; chairman fire committee, Ald. Clark. Oil storage tank for gasoline auto fire truck.

Tenders closed for garage, $4,000, James street. Owner, J. Porteous, 551 York street, Hamilton; architect, Mills & Hutton, Bank of Hamilton Chambers, Hamilton. One and three storeys, brick, stone and steel, stone foundation, cement work, cut stone, steel beams, hot water heating, electric lighting, tar and gravel roof, tile, skylights, coal chute. Contract let in a few days. Oil storage tank needed.

Halifax, N.S.

Tenders to be called for bank, $75,000, Granville and Duke streets. Owner, Merchants Bank of Canada; architect, Ald. Gates, Nova Scotia Telephone. Two storeys, 60 x 36, granite and glazed terra cotta, granite foundation, interior finish Italian marble, cement work, marble, terra cotta, fireproof, metallic lath, structural iron, vaults, fireproof doors and windows, pipe covering, plate glass, etc. Tenders received after July 22.

Jasper Park, B.C.

Hotel. W. P. Hinton, General Passenger Agent of the G. T. P., said a hotel would shortly be built at Jasper Park, B.C.

Ladner, B.C.

Plans being prepared for sawmill (45,000 capacity). Owner, the McLelan Lumber Co., 744 Hastings street west, Vancouver, B.C. Purchase of equipment probably on Mr. McLelan's return this week. Arrangements to construct [illegible] to be completed by [illegible]

Medicine Hat, Alta.

[illegible] Owner, City of Medicine Hat; engineer, A. [illegible] Medicine Hat. [illegible] gas well, 1,200 feet deep, 10 in. diameter

Tenders and For Sale Department

Tenders for Steel Bridge

Tenders marked "Tenders for Bridge," will be received by the undersigned, Chesley P.O., up till **August 3rd, 1911**, for the erection of two steel bridges—one over Snake Creek, 10th [illegible] and one on the County line, 7th Concession, Elderslie; the span of the bridges, 45 feet and 36 feet respectively. Also tenders for concrete abutments for same will be received at the same time.

Tenders will be opened at the County line bridge on Friday, August 4th, at 2 p.m.

Specifications for same may be had from James Warren, Engineer, Walkerton, after the [illegible]

The lowest or any tender not necessarily accepted.

(Signed) S. K. EWART,

Elderslie, July 17, 1911. 29-30

Department of Railways & Canals

Intercolonial Railways—Improvements at Halifax

FURTHER EXTENSION OF TIME

The time for receiving tenders for Pier and Sheds has been further extended from Monday, the 31st day of July, 1911, to Thursday, **the 10th day** of Au ust, **1911,** at 12 o'clock noon.

By order,
L. K. JONES,
Department of Railways and Canals,
Ottawa, July 17th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 30-31

TOWN OF NORTH BAY

Water Works Extension

Sealed tenders endorsed "Tender A" and "Tender B," "Tender C" and "Tender D," will be received by the undersigned up to Saturday. **August 5, 1911.**

Contract A. The laying of approximately 46,945 lineal feet of water mains, placing valves, valve boxes, hydrants, etc.

Contract B. The laying of approximately 500 lineal feet of 16 in. steel intake pipe, the construction of concrete pump well on lake shore and the necessary connections to two pumps.

Contract C. The supplying of approximately 15,500 feet lineal 14-in. pipe; 500 ft. lineal 16-in. steel pipe; 2,550 feet lineal 10-in. pipe; 27,745 feet lineal 6-in. pipe; 1,100 feet lineal 4-in. pipe; and the necessary tees, crosses, curves, etc.

Contract D. The supplying of approximately 32 hydrants, 11 14-in. gate valves and valve boxes, 5 10-in. gate valves and valve boves, 40 6-in. gate valves and valve boxes, 3 4-in. gate valves and valve boxes.

Separate tenders are desired for the supply of and laying of steel pipe, (2) cast iron pipe, and (3) wood stave pipe, in contracts "A" and "C".

Plans and specifications may be seen at the office of the Commissioner of Works, North Bay.

The lowest or any tender not necessarily accepted.

T. N. COLGAN,
Commissioner of Works.

North Bay, July 11, 1911. 29-31

Toronto Main Drainage

Tenders will be received on **Friday, August 4th, 1911**, for the construction of Low Level Interceptor, Don Syphon (crossing under the River Don), and for the manufacture and delivery of the following:—

280 linear feet 30-inch Cast Iron Pipe.

5,984 linear feet 42-inch Reinforced Concrete Pipe.

1,985 linear feet 30-inch Reinforced Concrete Pipe.

2,315 linear feet 36-inch Reinforced Concrete Pipe.

Plans, specifications, forms of tender and conditions relating to tendering as prescribed in City By-laws may be obtained from the Main Drainage Works office of City Engineer, Toronto.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman, Board of Control.

City Hall, Toronto,
July 14th, 1911. 29-30

Department of Railways and Canals

TRENT CANAL

Lockgates and Valve Gates

Holland River Division

Sealed tenders addressed to the undersigned and endorsed "Tender for Lock-gates and Valve Gates, Holland River Division," will be received at this office until sixteen o'clock, on **Friday, August 4th, 1911.**

Plans, specifications and form of contract to be entered into can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Superintending Engineer of the Trent Canal, Peterborough, Ont., at which places form of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $2,000, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.
Department of Railways and Canals,
Ottawa, July 7th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be pail for it. 29-30

BUCKET CRANE

FOR SALE—One 10 to 15-ton No. 1 Browning Locomotive crane, standard gauge, 4-wheel truck, 38 ft. steel boom, 8 x 10 engines, equipped to handle clam or orange peel. Will furnish with or without bucket. Attractive price, fine condition, quick delivery. Inspection here.

WILLIS SHAW MACHINERY CO.,
39 South LaSalle Street,
Chicago, Ill.

FOR SALE

Complete Electric Generating Set, consisting of Leonard Peerless steam engine direct connected to 150 k.w. Canadian General Electric generator, 2,300 volts, 60 cycles; also condenser, switchboard, steam and exhaust piping, spare parts for engine and generator, and everything constituting the complete set as at present installed in the Thomas street lighting station of the Town of Brockville. This machine is in first-class order, having only been used on peak loads. It is now being replaced by a larger Belliss & Morcom engine with Swedish G. E. generator. Full particulars and price can be obtained from Laurie & Lamb, Consulting Engineers, Board of Trade Building, Montreal. 28-35

CITY OF GUELPH

Tenders will be received by T. J. Moore, City Clerk, Guelph, Ontario, for the construction of a plain concrete arch bridge (two forty-foot spans), over the River Speed, Neeve street, Guelph, up to **Saturday, July 29th, 1911.**

Approximate amount of concrete is 385 cubic yards.

A marked cheque for **$100.00** is to accompany the tender.

Forms of tender may be obtained from the City Engineer.

Plans and specifications may be seen at the office of the City Engineer, or at the office of the Contract Record, Toronto.

L. MALCOLM,
29-30 Acting City Engineer.

Tender
for
Macadam Highway

Tenders will be received up till **July 29th, 1911**, by the Board of Highway Commissioners for York County, for the supplying of machinery with material, labor and constructing the following highways or parts thereof:

(a) LAKE SHORE ROAD.
(b) WESTON ROAD.
(c) VAUGHAN ROAD.
(d) KENNEDY ROAD.
(e) KINGSTON ROAD.
(f) DUNDAS STREET.

Particular sections are more specifically described, specifications and forms of tender, which may be secured at the office of the Engineer, Room 6, 57 Adelaide street east, Toronto.

MR. R. J. BULL, Chairman.
E. A. JAMES, Engineer to Board.
J. A. RAMSDEN, Secretary. 29-30

Tenders Wanted

Tenders are required for about 3,300 feet of 18-inch and 1,600 feet of 12-inch cast iron pipe, with a number of valves and specials. Tenders received not later than noon, **August 12th, 1911.** For specifications and forms of tender write H. J. Glaubitz, General Superintendent, Waterworks and Electrical Departments, London, Ont. 30

CITY OF GUELPH

Tenders

Tenders will be received by T. J. Moore, city Clerk, Guelph, Ontario, for the construction of a reinforced concrete arch bridge and viaduct over the Canadian Pacific Railway and the River Speed, Guelph, up to **Tuesday, August 8th, 1911.**

Approximate amount of concrete is 521 yards.

A marked cheque for $400 is to accompany the tender.

Forms of tender may be obtained from, and plans and specifications seen at the office of the City Engineer, Guelph, or at the offices of the Contract Record and Canadian Engineer, Toronto, Ont.

Plans and specifications may also be obtained for the sum of $5.00 per set, which will be returned upon return of plans.

Lowest or any tender not necessarily accepted.

L. MALCOLM,
Acting City Engineer.
Guelph, July 21st, 1911. 30-31

Department of Railways and Canals

Intercolonial Railway

FREIGHT SHED at HALIFAX

Sealed tenders addressed to the undersigned and endorsed "Tender for Freight Shed at Halifax," will be received at this office until 12 o'clock noon of the **1st of August, 1911**, for the construction of a Freight Shed on the Quay Wall at Halifax, N.S.

Plans, specifications and form of contract to be entered into may be seen and full information obtained on and after this date, at the office of the Chief Engineer, of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Intercolonial Railway at Moncton, N.B., or at the office of the Board of Trade, Halifax.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $2,000,000 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Department of Railways and Canals,
Ottawa, July 17th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 30-31

Tenders

Sealed tenders addressel to the undersigned will be received until **Monday, August 7th**, for the construction of a Municipal Drain in the Township of Minto. The estimated amount of excavation is 21,600 cubic yards, and the work must be completed by November 1st, 1912.

Profile and specifications can be seen at the office of the undersigned.

W. D. McLELLAN,
Clerk of Minto,
30-31 Harriston, Ont.

Tenders for a Steel Bridge

Sealed tenders marked "Tender for Bridge," will be received by the undersigned up to noon on **Monday, August 7th, 1911**, for the construction of a 40-foot span over the Humber River, on the Seventh Line, Albion Township, about one mile from the Village of Palgrave.

Specifications may be obtained from the undersigned.

The lowest or any tender not necessarily accepted.

C. R. WHEELOCK,
County Engineer.
Orangeville, July 22, 1911. 30-31

Tenders for Steel Bridge

Sealed tenders marked "Tenders for Bridge," will be received up to noon, **Saturday, August 5th, 1911**, for the construction of two spans of 125 feet each and one span of 90 feet, over the Saugeen River, 10th Concession, Brant.

Also tenders, marked "Tenders for Abutments," will be received up to the above date for the concrete work for two abutments and two piers for the above bridge.

Tenders will be opened at the December session of the County Council, December 6th, 1911.

Specifications may be had from the undersigned.

The lowest or any tender not necessarily accepted.

JAMES WARREN,
Engineer.
Walkerton, July 17, 1911. 29-30

Canadian Delivery

Nine Steel Skips, 4 ft. 6 in. x 2 ft. 6 in. x 5 ft. 6 in. Good order.

Twenty h.p. Stat. Boiler, 10 ft. x 3 ft. No front. Good order.

Hayward O. P. Bucket, one extra blade; almost new.

Porter 14-ton Locomotive, 36 in. gauge, cyls. 9 x 14; first class.

Twenty-two Western two-way dump cars, 36-in. gauge, four cubic yards; good.

Terry & Tench Stiff Leg Derrick, Bull wheel, boom 14 in. x 14 in. x 55 in.; first class.

Eight Continental two-way dump cars, four cubic yards, used two months; first class.

Twelve K. & J. two-way dump cars, four cu. yds.; used two months.

10 in. x 10 in. x 12 in. Gould Cent. Pump, belt driven. New.

No. 7 Pulsometer Pump, 5 in. x 4 in. Used one year.

Two Leonard 25 h.p. engines, used 1 and 6 months.

Six Lockwood 1-yard Automatic Steel Dump Skips. New.

Twenty-four new drag scrapers.

Steam hammer for sheet piling; used one week.

Write us if you want to buy or sell.

THE MALES COMPANY,
No. 82 Perin Bldg., Cincinnati, O.

CITY OF REGINA

Tenders

for the Construction of Water Works Supply Mains and Two Concrete Basins

Sealed tenders addressed to the City Commissioners, Regina, and endorsed on envelope "Tender for Waterworks Supply Main Construction," or "Tender for Construction of Concrete Basins," as the case may be, will be received up to 12 o'clock noon, **Friday, August 4th, 1911**, for the:

(a) Trenching, laying and backfilling for approximately 11,200 lin. feet 18-in. steel pipe, and 1,000 lineal feet of 16-in. Cast Iron Pipe.

(b) Construction of a 2,000,000 gallon concrete High Level Basin. And the construction of a 225,000 gallon concrete pump well.

Particulars may be had upon application to the City Engineer.

A marked cheque for $500 must accompany each tender for Waterworks Supply Main Construction.

A marked cheque for $1,500 must accompany each tender for Construction of Concrete Basins.

The cheques of the unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

(Signed) L. A. THORNTON,
30 City Engineer.

TOWN OF WILKIE

Sealed tenders will be received by T. A. Dinsley, Secretary-Treasurer of the Town of Wilkie, until noon, **Monday, August 21, 1911**, for supply and delivery of the following machinery, materials, and performance of certain works:

Tender A.—Electrical Machinery—
(1) One 60 kw. 3-phase, 60 cycle, 2,200 volt a.c. Generator.
(2) One Exciter for above.
(3) One marble switchboard, instruments and switches.
(4) Three 2,200 voltmeters, back-geared to pumps.
(5) Five transformers for lighting system.
(6) Series Tungsten street lighting system.
(7) Approximately 25 cwt. of weather-proof copper wire (line material, guy wire, arms, pins, insulators, etc.)
(8) Cedar poles.

Tender B.—One 100 I. H.P. Internal Combination Engine—

Tender C.—Pumping Machinery—
(1) One working head and deep well cylinder.
(2) One-half million gallon pump.
(3) One air compressor.
(4) Necessary shaftings and belting.

Tender D.—
One Pneumatic Storage Tank.

Tender E.—
Approximately 1,100 ft. 8-inch. c.i. water pipe.
Approximately 4,800 ft. 6-inch c.i. water pipe.
Approximately 2,000 ft. 4-inch c.i. water pipe.
Approximately 15 hydrants and 22 valves.

Tender F.—
Trenching, laying cast iron water pipes, hydrants, valves, etc., and back filling.

Tender G.—
Erection of power house and constuction of reservoir.

Plans and specifications may be seen at the office of the secretary-treasurer of the Town of Wilkie [illegible] Arthur & Murphy, Room 8, Bottomly Block, [illegible]

A marked cheque for five per cent. of amount of the tender must accompany each bid.

The lowest or any tender not necessarily accepted.

McARTHUR & MURPHY, [illegible]
[illegible]
T. A. DINSLEY, Secretary-Treasurer,
30-31 [illegible]

To Contractors

[illegible] "Tender for New [illegible] at this Department until [illegible] Tuesday, August 22nd [illegible] stone and [illegible] steel work, roofing and [illegible] Government House [illegible] Plans and [illegible] may be seen at the department. [illegible] payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender, and the bona fide signatures and ad[illegible] accompany each tender. Cheque will be forfeited to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after acceptance. The department will not be bound to accept the lowest or any tender.

By order,

H. F. McNAUGHTEN,

Secretary Public Works Department.

Department of Public Works, Ontario, Toronto, July 21st, 1911.

Newspapers publishing this advertisement without authority will not be paid for it.

30-31 32-33

Positions Vacant

Advertisement under this heading one cent a word per insertion. Box No. ten cents extra

AGENTS WANTED—United States firm manufacturing sawmill, well-drilling and prospecting machinery, desires to secure Canadian representatives. For particulars write E. J. Mc[illegible] 4050 Perry street, Chicago, Ill. 30-31

FOREMAN WANTED. Wanted, a Construction Foreman on a large mill to be erected in Toronto, one who understands masonry, carpentry, and steel construction, also familiar with local conditions. Engagement September [illegible] Box 305, Contract Record, Toronto. 30-31.

SUPERINTENDENT WANTED. Superintendent of Construction; a man thoroughly familiar with all kinds of form work for reinforced concrete buildings, must be a first-class man. First class salary. State experience and give references. Box 306, Contract Record, Toronto. 30-31

Positions Wanted

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

Electrician, practical, theoretical and commercial, open for engagement; 20 years' experience in high tension, overhead and underground work; also designing, erecting and running power plants; good organizer and hustler; first-class references. Box 297, Contract Record, Toronto, Ont. 29-30

Business Buildings and Industrial Plants

(Continued from page 61)

at bottom. Contractor to supply casing tested to 1,500 lb. pressure; also drilling apparatus. Tenders closed July 20.

Montreal, Que.

Tenders closed for bank, $30,000, 200 St. James street. Owner, Molson Bank. Architect, H. A. Stone, 84 St. Frances Xavier street, Montreal. Two storeys, 66 x 90, stone foundation, brick and stone, cement work, steel beams, hot water heating, electric lighting, marble, tile, mantels, ornamental iron, cornice, electrical work, telephone system, electric bells, plate glass. Tenders called July 15th.

Tenders to be called for bank interior fittings, Windsor street annex. Owner, Bank of Montreal, Montreal. Architect, Peden & MacLaren, 20 St. Alexis street, Montreal. Bank on ground floor, new C. P. R. Windsor Station. Contract just awarded for concrete vault work to C. E. Deakin, 11 St. Sacrament street; vault doors, Ahern Safe Co., Ltd., Montreal. Tenders for interior fittings to be called shortly.

Tenders to be called for offices. Owner, Sheddon Forwarding Co., 31 Victoria Square, Montreal; architect, Brown & Wallace, 32 Canada Life Bldg., Montreal. Nine storeys, steel and concrete, cut stone, concrete foundation, reinforced concrete, hot water heating, electric lighting, marble, tile, mantels, passenger elevators, structural iron, ornamental iron, cornice, elephone system, plate glass. Tenders called after July 20th.

Nanaimo, B.C.

Plans being prepared for stores and offices. Owner, James Young; architect, A. Forrester, Nanaimo. Three storeys, 60 x 132, 63 rooms, brick, concrete.

Proposed building of stores and offices, $20,000. Owner, Victor Janey; architect, A. Forrester, Nanaimo, B.C.. 2 storeys, 51 x 132, concrete basement, brick superstructure. Plans in course of preparation.

Oshawa, Ont.

Contemplated, manufactory. Party interested, J. D. Storie, Ontario Malleable Iron Company, Oshawa. Equipment required for first class up-to-date brick making plant. Site has been purchased. The question of utilizing electric power is being discussed.

Ottawa, Ont.

Tenders to be called for commercial building, Sparks street. Owner, Blackburn Bros., Ottawa; architect, W. E. Noffke, Central Chambers, Ottawa. Ten storeys, 45 x 65. Tenders called for stone work (grey granite) and brick work in about two weeks.

Tenders called for bakery, two buildings. Owner, Slinn-Shouldis, Limited, Ottawa; architect, James Mather, Wellington street, Ottawa. Two storeys, 97 x 123, 45 x 90, steam heating (2 boilers), electric lighting. Tenders called for plumbing, plastering, painting and electric wiring work and transmitting until July 23.

Prince Rupert, B.C.

Work in progress for office and stores, $10,000. Owner, David H. Hays, Prince Rupert; architect, W. L. Barker, Third avenue, Prince Rupert; general contractor, Coast Construction Company, Prince Rupert. Cement and excavation, Toni Christiansen, Prince Rupert. Two storeys and basement, 50 x 100, wood, cement foundation, hot water heating, electric lighting, electric fixtures, three lavatories and fixtures, art glass and electric door opener needed.

Qu'Appelle, Sask.

Rural telephone line. Work waiting for contractor to commence construction; about ten miles in length. Write W. G. Vicars, S. Qu'Appelle, Sask.

Ste. Therese, Que.

Rough plans accepted for bank. Owner, Molsons Bank, Montreal; architect, Philip J. Turner, Board of Trade, Montreal.

St. Thomas, Ont.

Contemplated, addition to bank building, Talbot street. Owner, Molson Bank, Montreal, Que; architect, P. J. Turner, Board of Trade, Montreal. Cut stone. Tenders will be called shortly.

Sedgewick, Alta.

Mr. J. I. McLeod, of Spokane and Calgary, is said to have purchased iron ore areas near here. Large steel works, involving expenditure of many millions, may be erected.

St. John, N.B.

Tenders to be called for brick block, Union and Brussels streets. Owner, Bishop Casey, Roman Catholic Diocese of St. John. Three storeys, 40 x 80, steam heating, electric lighting. Tenders will be called the latter part of this week.

Toronto, Ont.

Destroyed by fire, business building, Queen street. Owner, Thomas Thompson Estate. Loss as follows: Copeland Chatterson's stock of office equipment, interior fittings, desks and writing machines, books, etc., by water, $10,000. James Hartman's bowling alley, by fire and water, $2,000; the Oriental Billiard Room, $2,000; Sergeant's Mess of the 10th Royal Grenadiers, $10,000.

Work in progress for store and dwelling, $6,000, E. S. Bloor street. Owner, H. W. Macdonald, Toronto; architect, J. A. Harvey, 502 Manning Chambers, Toronto. Three storeys, 16 x 52, brick and stone, hot water heating, electric lighting, open plumbing, felt and gravel roof, cement, cut stone, brick, metallic lath, cornice, skylights, electrical work, electric bells, steel beams, plate glass.

Tenders called for three buildings, $4,000, east side Perth avenue. Owner, W. Burton, 1253 Dufferin street, and G. Howard Gray, 304 Lumsden Bldg., Toronto. Two storeys, 44 x 40, brick, concrete foundation, hot water heating, electric lighting, open plumbing, felt and gravel roofing. Tenders received for a week.

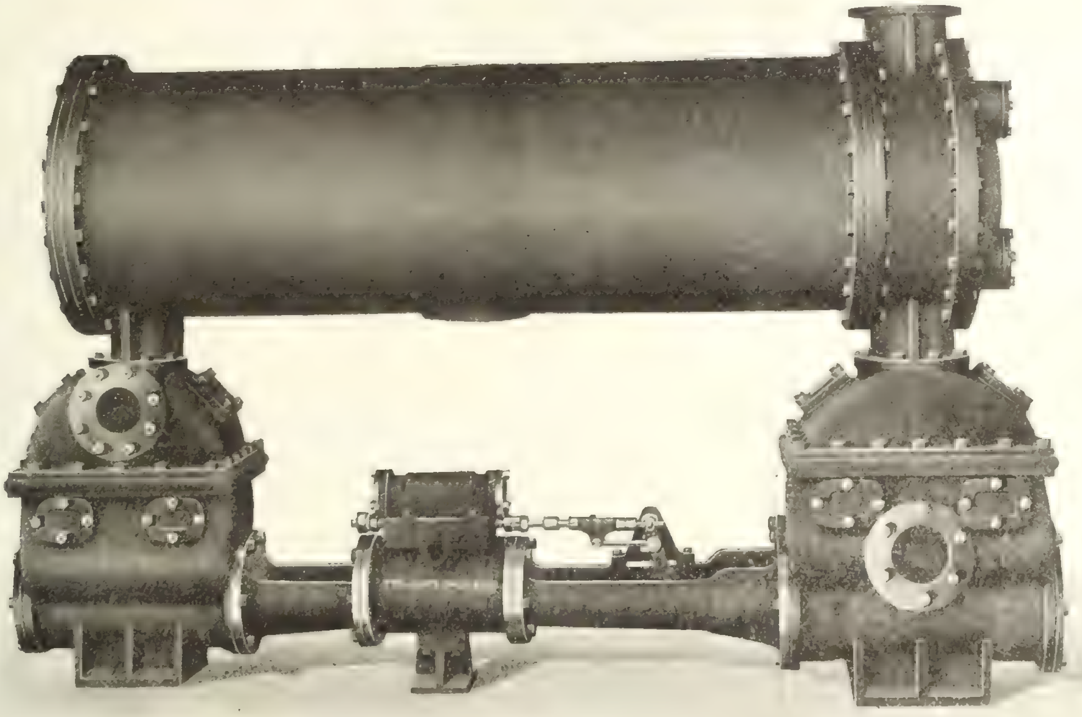
Work in progress of two attached stores, Cor. Bloor and Ossington. Owners, J. W. Walker, 501 Palmerston Bvd., Toronto; architect, J. Hunt Stanford, 34 Yonge Street Arcade, Toronto. Three storeys, 120 x 50, brick and stone, stone foundation, hot water heating, electric lighting, open plumbing, felt and gravel roof, cement, cut stone, marble, brick, tile, mantels, metallic lath, structural iron, sheet metal, metal ceiling, cornice, skylights, electric work, electric bells, steel beams, iron columns, plate and art glass. Owner wil build by day labor.

Garage. An automobile garage is to be built at the corner of Bloor and Schultz, 4 La Plaza, Jarvis and Charles streets, Toronto.

Warehouse. F. R. Cowan, 100 Duchess street, is the architect for a $10,000 warehouse to be erected at 51 Britton street, two storeys, 68 x 62, brick, stone foundation, electric lighting, felt and gravel roofing.

Work in progress for addition to

CONDENSORS



Condensor built by The John Inglis Co., Limited

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

Let us Submit Prices.

The John Inglis Company
Limited

Engineers and Boilermakers

14 Strachan Ave., TORONTO, Canada

store, $[illegible], Yonge street. Owner, [illegible] Ltd., [illegible] Yonge street, Toronto; architect, Geo. W. [illegible] Temple Building, Toronto. One storey, 18 x 64, [illegible] concrete foundation, electric lighting, felt and gravel roof, cut stone, artificial stone, electric work, asbestos materials, steel [illegible] refrigeration.

Westmount, Que.

Contemplated, Garage, St. Catherine and Metcalfe streets. Owners, A. E. Rollitt & Co., Montreal; architect, P. J. Turner, 121 Board of Trade Building, Montreal. Two storeys, 150 x 100, fireproof throughout, reinforced concrete, freight and passenger elevator.

Wolfville, N.S.

Contemplated, bank, $10,000. Owner, Royal Bank of Canada; manager, R. Crighton, Wolfville; supervisor of branches, A. D. McRae, Royal Bank of Canada, Halifax. Construction will probably start in 1912.

Winnipeg, Man.

Materials required for bank, $15,000, Sargent and Sherbrooke streets. Owner, Union Bank of Canada. Architect, Jordan & Over, 47 Canada Life Bldg., Winnipeg. Two storeys, brick, stone foundation, steam heating, electric lighting, felt and gravel roof, interior finish oak. Contract awarded.

Work in progress for warehouse. Owner, W. Ackland & Son, Winnipeg; architect, Frank R. Evans, Somerset Block, Winnipeg; general contractor, Claydon Bros., Winnipeg. Four storeys, brick and stone, felt and gravel roofing, electric lighting. Materials to be called for.

Work in progress for warehouse, Henry avenue. Owner, Royal Crown Soap Co., Winnipeg; architect, J. H. G. Russell, 1110 McArthur Bldg., Winnipeg. Addition to present plant, 3-storey mill construction, steam heating, electric lighting, asphalt roofing. Materials are required.

Tenders called for steam heating system. Owner, City of Winnipeg; secretary board of control, M. Peterson. Complete steam heating system for offices of sub-station No. 1 on King street. Plans, specifications, etc., at office of the power engineers, Carnegie Library Bldg., Winnipeg. Tenders will be received by the chairman until 11 a.m., July 24.

Tenders called for five stores, $20,000. Owner, E. McKenty, Winnipeg. Architect, F. R. Evans, 506 Somerset Block. One storey at present, brick and stone, concrete foundation, steam heating, electric lighting, felt and gravel roof. Tenders received by owner until July 26th.

Tenders to be called for hotel (Selkirk). Owner, Grand Trunk Pacific Railway, Montreal, Que.; architect, Ross & McFarlane, 1 Belmont street, Montreal. Foundation, concrete and pile, stone and brick, copper roof, interior finish, fireproof. Estimated cost upward of a million. Tenders received after July 25th.

Yorkton, Sask.

Department Store. The Hudson Bay Company will establish a department store at Yorkton. Plans are being prepared and building operations will commence on August 1. Building to be 150 x 120, three storeys, freight and passenger elevators.

CONTRACTS AWARDED

Brantford, Ont.

Additions to bakery, Colborne street. Owner, J. McHutchison, 363 Colborne street, Brantford. General contractor, A. J. Cromar, Brantford. Two storeys, 40 x 56 and 27 x 65, brick, concrete foundation.

Carleton Place, Ont.

Bank building, $10,000, Bridge street. Owner, Union Bank, Quebec; architect, J. P. McLaren, Ottawa; masonry contractor, Coles & McGregor; wood work, Mr. McKay, Ottawa. 2 storeys and basement, 36 x 50, brick, stone foundation, hot water heating, electric light, iron roof, hardwood finish, vaults, plate glass.

Fort William, Ont.

Traders Bank branch, $30,000, Victoria. Owner, Geo. A. Graham, Fort William; architect, C. Wirth, Fort William; contractor, M. H. Braden, Fort William. Three storeys, 25 x 100, solid brick, terra cotta. Heating and plumbing contract not let yet. Fixtures and furnishing supplied by Traders Bank.

Hillsboro, N.B.

Plaster mills, $100,000. Owners, Albert Mfg. Co., Hillsboro, N.B. Four storeys, wood and iron, stone foundation, steam heating, fireproofing, brick, structural iron, sheet metal work. The above price is said to include equipment.

Hamilton, Ont.

Garage, $4,000, James street. Owner, J. Porteous, 551 York street, Hamilton; architects, Mills & Hutton, Bank of Hamilton Chambers, Hamilton; general contractor, Geo. Congdon, 31 Inchbury, Hamilton. One and three storeys, 24 x 124, brick, steel and stone. Contract was let July 15.

Two stores, $6,000, Main and Sherman avenue. Owner, J. Morrow, Bank of Hamilton Chambers, Hamilton; architect, Stewart McPhie, Bank of Hamilton Chambers; general contractors, Bennet & Thwaites, 52 Farleigh avenue north, Hamilton. Work to be done by day labor. Contract was let July 17.

Montreal, Que.

Offices, $80,000, 41 Union avenue. Owner, Wm. St. Pierre, 41 Union avenue, Montreal; architect, Findlay and Spence, Beaver Hall Hill, Montreal; general contractor, Hefferman & Beck, Montreal. Six storeys, steel and concrete.

Brass shop. The contract has been awarded to D. G. Loomis & Sons, Montreal, for the erection of a $60,000 brass shop by the Canadian Pacific Railway.

Offices. The contract for a $5,000 office building, brick, two storeys, 26 x 58, being erected by E. & W. S. Maxwell, at 6 Beaver Hall Square, has been awarded to Messrs. P. Lyall & Sons, Ltd., 213 Board of Trade Bldg., Montreal. Plans prepared by Claude P. Jones, architect.

Ottawa, Ont.

Office building, Sparks street. Owner, Blackburn Bros., Ottawa. Architect, W. E. Noffke, Central Chambers, Ottawa; contractor for steel, Dominion Bridge Company, Montreal. Steel, 10-storeys. Contract for second section of building about 300 tons.

Winnipeg, Man.

Bank, Portage avenue and Smith st. Owner, Sterling Bank of Canada; architect, James Chisholm & Son; general contractor, Carter-Halls-Aldinger Co., Winnipeg. Nine storeys, terra cotta, pressed brick.

MacLean Daily Reports

The only systematic method yet devised for reporting BUILDING AND ENGINEERING projects from their inception to completion. Ask us for Rates and Specimen Reports.

220 King Street West - TORONTO

RADIAL BRICK CHIMNEYS

H. R. HEINICKE, Inc.

65 Victoria St., Montreal, Que.
Mail Building, Toronto, Ont.
147 Fourth Ave., New York

Consult Us—We are Experts—30 years' experience—Chimneys in all parts of the world

Terra-Cotta Fireproofing

Get an Estimate from

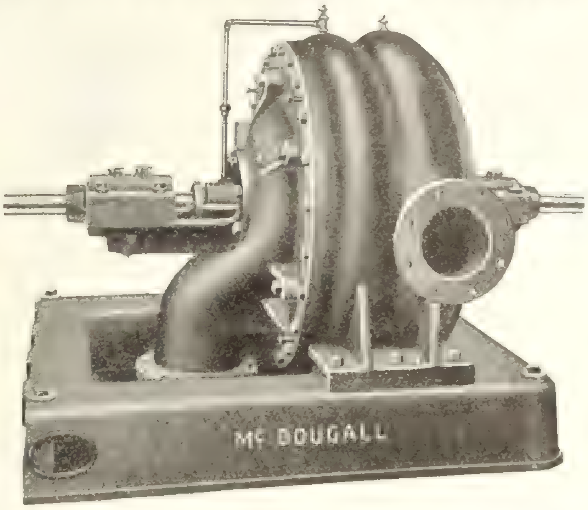
ROBERT BENNETT
Contractor

347½ Euclid Avenue, Toronto

☞ Over 25 years experience in U. S. and Canada

PHONE COLLEGE 4362

Worthington Turbine Pumps



The Worthington Turbine Pump is now accepted by the best engineers for all services where it is desired to deliver water against high heads. There is a limit to its application; but this limit is being continually widened by improved design, and at the present time the turbine pump is successfully employed for service where heretofore the reciprocating pump has been used exclusively.

Bulletin 109

gives a great many illustrations of these pumps driven directly by electric motors, steam turbines, steam engines and water wheels as well as belted to the different forms of power and will be sent on application.

Capacity 1217 Imperial or 1460 U.S. gallons per miuute against 100 lbs. pressure. 150 H. P. 750 r. p. m. London, Ont.

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

LIMITED

WORKS:
512 William St., MONTREAL

SALES OFFICES:
MONTREAL, TORONTO, COBALT, WINNIPEG, CALGARY, VANCOUVER

THE POPULAR AND SUPERIOR

PERFECT BRICK MACHINE

AND MY VARIOUS MOULDS ARE USED IN ALL PARTS OF THE WORLD

Patented in Canada

C. S. WERT

Inventor and Manufacturer of

The Perfect Brick Machine and Moulds

602 North Main St.,
Kendallville, Ind., U. S. A.

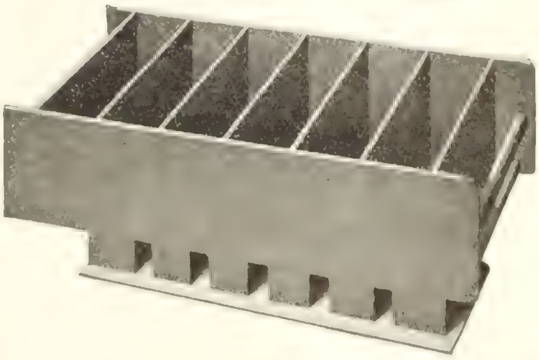
Write for Catalogue and Prices

Agents and Distributers wanted in Canada.

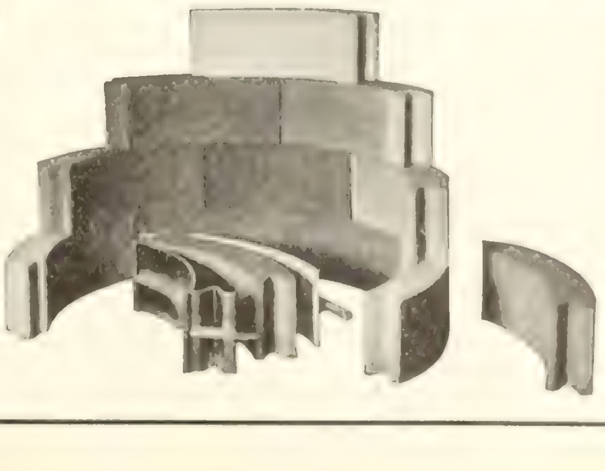
THE POPULAR AND SUPERIOR

PERFECT BRICK MOLD

IS USED IN ALL PARTS OF THE WORLD



The Perfect Well, Cistern and Silo Molds



PRICE LIST

No. [illegible] Circle Mold. The diameter of its circumference, [illegible] feet
No. 5 Circle Mold. The diameter of its circumference, 5 feet
No. 7 Circle Mold. The diameter of its circumference, 7 feet
All sizes up to 7 foot retail at $[illegible] each. All other sizes retail at $[illegible] each.

The Circle Molds vary in length from [illegible] to 18 inches depending on the diameter of its circumference.

In ordering Circle Molds always give the diameter of what you are going to build and I will then understand the kind of Circle Mold you desire

No. 10 Circle Mold is 10 ft. diam.
No. 12 [illegible] 12 [illegible]
No. 14 [illegible] 14 [illegible]
No. 16 [illegible] 16 [illegible]

Price $15.00 each

Looking for Business

Then our DAILY REPORT SERVICE will help you. Our organization provides the only systematic method yet devised for reporting Building and Engineering projects from their inception to completion.

Special facilities for gathering news of sales opportunities in machinery, equipment and materials required.

Ask us for further information. Let us send you rates and specimen reports.

We Want Men

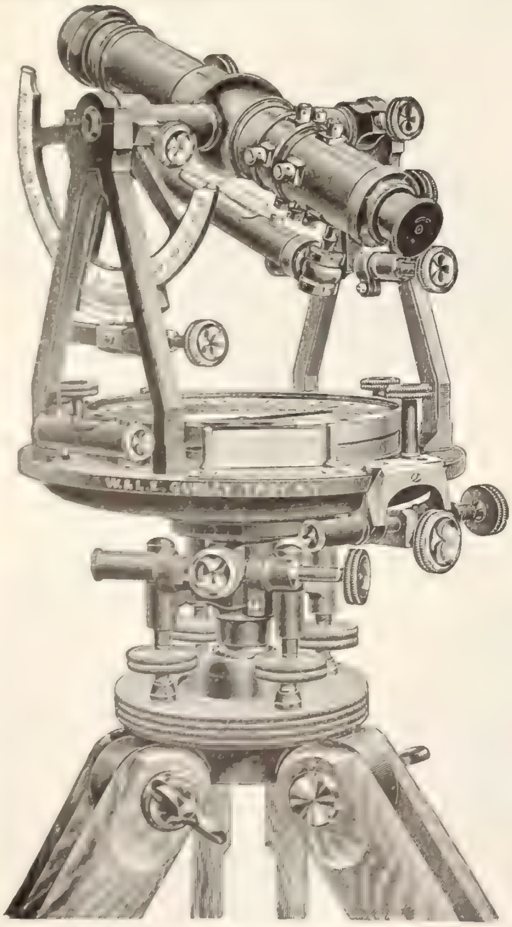
We require a man in every important town in Canada to report the progress of the building and engineering activities of his locality. We want men to tell us when machinery, equipment, supplies and materials are required—men who can report promptly and accurately news of all sales opportunities in these trades.

We report this information daily to our subscribers. This enables them to get in direct touch with the buyer.

There are one or two places where we are not represented. Perhaps it is your town. It will be worth your while to ask us.

MacLean Daily Reports

Head Office: 220 King St. West, Toronto. Branches: Vancouver, Winnipeg and Montreal



1845 **1911**

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

Transits
Y Levels
Compasses
Plane Tables

Current Meters
Levelling Rods
Chains
Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

"Nothing is impossible to pains and patience, but it takes the best material to insure complete satisfaction."
—The Philosopher of Metal Town.

"METALLIC"

Rock Faced and Brick Siding

when in place cannot be distinguished from genuine brick or stone.

An economical, ornamental and durable siding for small houses, automobile garages, office and store fronts, etc.

"Manitoba" Steel Siding

for Elevators, Mills, Storehouses and Factories.

Made from the best quality galvanized or painted sheet steel; it is FIREPROOF and DURABLE, and presents a very neat appearance.

For further information, send for our new catalogue No. 70. Interesting information on Metallic Building Materials.

Manufacturers 1952

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

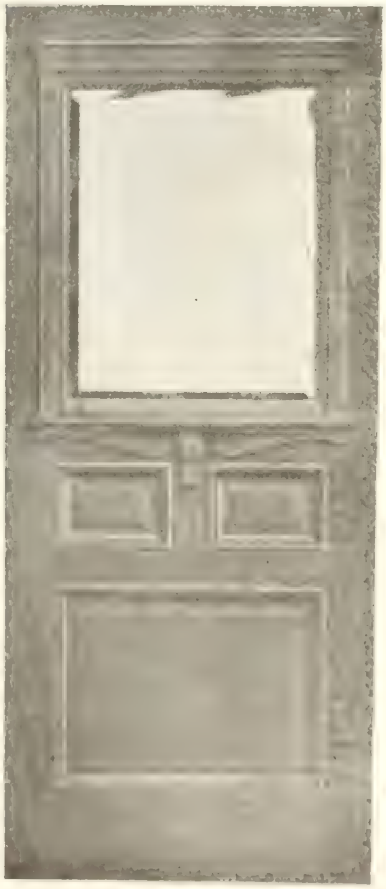
Armstrong
CRANES

Built for Every Service
up to 75 tons capacity

Electric Traveling Cranes, Standard
Electric Traveling Cranes, Special
Electric Gantry Cranes
Electric Jib Cranes
Hand Operated Cranes
Locomotive Cranes
Hydraulic Cranes

H. J. ARMSTRONG

Engineer and Manufacturer
Markdale, Ont., Can.



BRYAN DOORS

Noted for their Beauty and Durability

Send us your [illegible]
[illegible]

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario

"Hammer Brand"

Hard Wall Plaster

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.

Hillsborough, New Brunswick, Canada

Works Destroyed by Fire

— Now Rebuilding

Producers of the Celebrated

"Peerless"

Bedford Stone

Bedford Indiana Limestone

Mill Blocks

Sawed Planed and Turned Stone

W. McMILLAN & SON

(Incorporated)

General Offices

Chamber of Commerce Building

CHICAGO, ILL.

Quarries and Mills { Bedford, Ind.
Bloomington, Ind.

A Reliable Waterproofing

For Cement and Concrete

Unlike all others for foundations, cellars, cellar floors, tunnels, dams, reservoirs, swimming pools, building walls, bridges, etc.

What is Ceresit ?

Ceresit is the name of a dependable waterproofing.

Ceresit is a cream white paste which is added to, and is generally dissolved in the water used in mixing cement mortar and concrete.

By mixing in the water the Ceresit permeates the entire mass uniformly. This is impossible with powdered waterproofing.

Italian Pool in the Gardens of Doubleday, Page & Co., Publishers of "Country Life," at Garden City, Long Island, waterproofed with Ceresit

Ceresit for Cement Mortar

Ceresit can be mixed with the water used in cement mortar coating to waterproof or dampproof structures built of any material such as brick, stone, concrete stucco, plaster and tile.

Ceresit is Guaranteed

Ceresit is guaranteed to be an unfailing, permanent waterproofing when the work is done under our direction.

Ceresit for Concrete

Ceresit is incorporated in the concrete mass and thus becomes a part of it, permanently rendering the mass proof against the penetration of water even under great water pressure besides protecting it from frost.

Please write for our Book "S" on "Waterproofing" for Cement and Concrete. Ceresit is catalogued on pages 46 and 47 of Sweet's Index.

Ceresit Waterproofing Company, Chicago

General Offices Commercial Bank Bldg.

Branches: 1133 Broadway, New York 1218 Chestnut St., Philadelphia

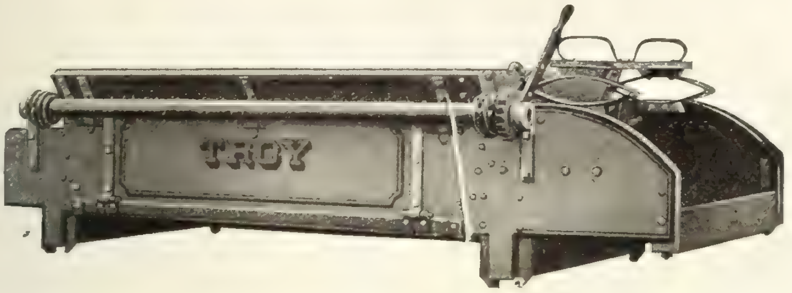
PLEASE CUT OUT THIS

REMINDER

to write for BOOK "S" on

WATERPROOFING

to Ceresit Waterproofing Co., Commercial Bank Bldg., Chicago.



Hot Weather Advice

When the mercury is round the 100 mark, it pays to look out for your driver. Don't make him waste time and strength pulling out slats. Put a TROY Dump Box on your gear and he won't have to leave the seat. A Box keeps him in good humor—he does more work and better work. Get Bulletin Z—You'll like the saving and you'll like the price.

The Troy Wagon Works Co., North Market Street, TROY, OHIO

The Carey Roof Standard

CAREY'S FLEXIBLE CEMENT ROOFING

TO PROVE TO YOU the high, standardized construction and composition of Carey's Roofing, we want to send you Booklet and Sample Free, and give you practical information regarding Carey's Roofing based on 25 years' actual time-proved tests Carey's Roofing is equally adapted to flat or steep surfaces, wood sheathing, tile or concrete. Whether your contract is large or small, we want to show you the advantage of using a standardized roofing material. The Philip Carey Mfg. Co., 60 Wayne Ave. Cincinnati, O. 50 Branches.

"FAMOUS FOR DURABILITY"

The Des Moines Hemispherical Bottom Steel Tanks and Towers

have been used and approved by nearly all leading Engineers. They are undoubtedly the most economical means of storing water at an elevation.

We have built many of these in Canada the United States and Mexico.

Estimates cheerfully furnished.

Send for Catalog No. 15

Des Moines Bridge & Iron Co.

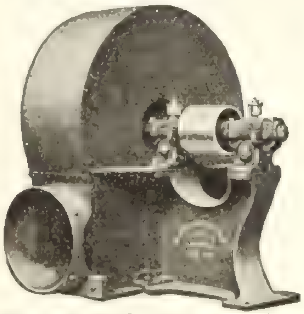
Pittsburg, Pa., U.S.A., 945 Curry Bldg.
Des Moines, Iowa, U.S.A. 938 Tuttle St.

Fred Holmes, President C. P. Holmes, Sec'y-Treas.

Telephone North 663

Fred Holmes & Sons
Limited
Building Contractors

1113 Yonge St., Toronto



Sturtevant

Stock Fans

Embrace such a diversity of types and sizes that nearly any ordinary conditions of fan engineering may be met by a fan shipped from stock.

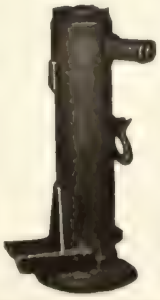
Spare parts always ready for immediate shipment.

STURTEVANT Engineers suggest and recommend apparatus to meet requirements.

ASK THEM. 863

B. F. STURTEVANT, Hyde Park, Mass.

Polson Iron Works Ltd., Toronto Eadie-Douglas Ltd., Montreal



THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material: best grades of malleable iron and steel Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

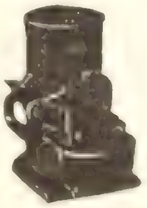
To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

Manufactured by

H. & E. Lifting Jack Company

Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal



Save 75 cents a day on each Bricklayer

Possible with **Renfrew Lime** and you can lay 200 more bricks a day.

"Renfrew" will make more mortar per 100 lbs. of lime and it sets very hard.

Bricks are easily bedded down when "Renfrew" Lime is used.

Try it, and be convinced.

'Renfrew' the Lime of Quality

Jamieson Lime Co.

RENFREW, ONTARIO

White Lime - Stone - Grey Lime

Brick - Drain Tile

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

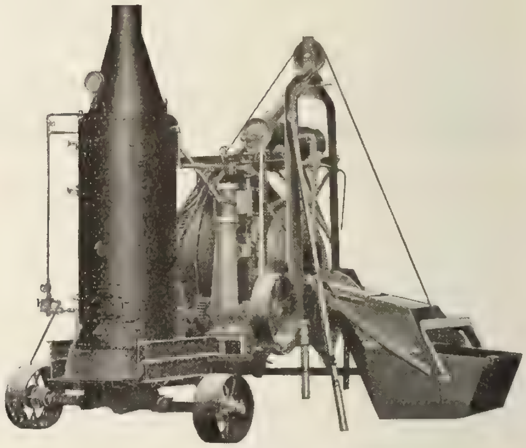
Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A.

The Foote Concrete Mixer

A Batch Mixer with a continuous output. Find out how we do it.



No. 6 End-discharge

The General Machinery Co., Ltd.

526-7 Traders Bank Building
TORONTO, ONT.

Steel and Wood **TANKS**

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

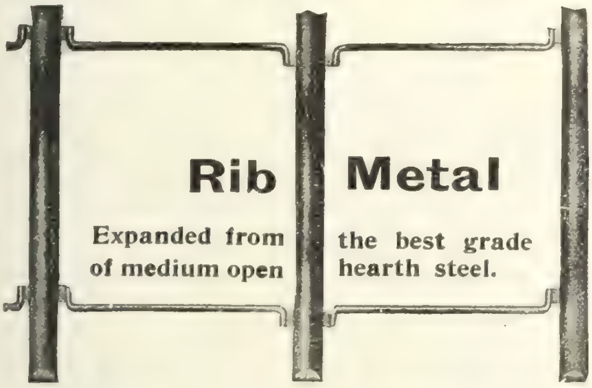
STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

KAHN SYSTEM

of Construction includes


Rib Metal
Expanded from of medium open
the best grade hearth steel.

Supplied in sheets up to 18 ft. in length, width 16 ft. to 5 ft. 4 in. For reinforcing concrete floors, roofs, walls, cisterns, etc.

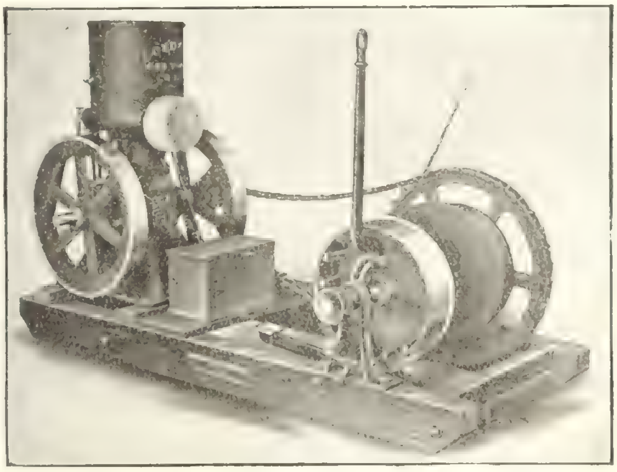
Other Products—**Kahn Truss Bars, Rib Bars, Hy-Rib, Trus-Con.** Chemical products for waterproofing and finishing concrete.

Trussed Concrete Steel Co.
of Canada, Limited

Head Offices and Works, Walkerville, Ont.

BRANCHES:
TORONTO—23 Jordan St. WINNIPEG—Union Bank Bldg.
MONTREAL—128 Coristine Bldg. VANCOUVER—52 Hutchinson Bldg.

DO YOU WANT A GOOD HOIST?



PATENT APPLIED FOR

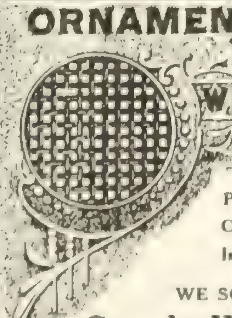
"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work Mortar Conveying Well Digging
Bridge Building Sewer Building Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists London, Canada



ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

ROBERT W. HUNT, President
THOS. C. IRVING JR., Vice-Pres
[illegible]
[illegible]

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, Canadian Express Bldg., Montreal, Que.
Branch Offices, Traders Bank Building, Toronto, Ont.
Norfolk House, Laurence Pountney Hill, London, E.C.

[illegible] Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's New Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

for concrete reinforcement is made from high carbon, cold drawn wire. The process of cold drawing eliminates the possibility of flaws. Perfection Wire Mesh is necessarily perfect.

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

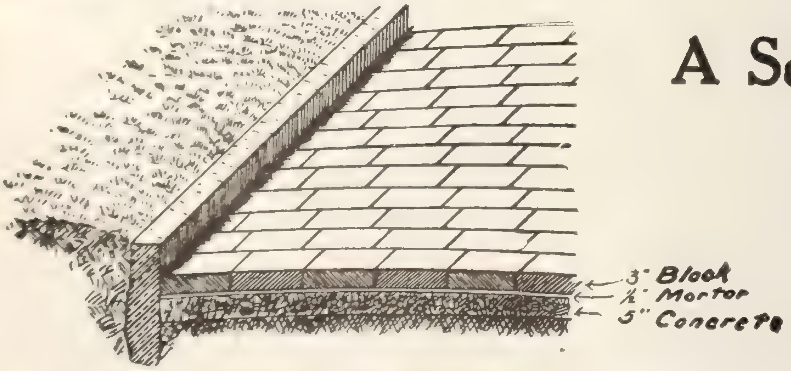
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

for Highest Efficiency, Absolute Reliability, Greatest Economy

Used by the Largest Mining Companies and Hydro-Electric Plants.
Also Extensively for Dredging, Exhaust Steam, Compressed Air, etc.

Sizes 3 to 42" Diameter up to ¼" in thickness
Easily installed and securely connected with our Forged Steel Flanges or All Steel Bolted Joints.

Write for our Catalogue S-A and prices on your requirements

AMERICAN SPIRAL PIPE WORKS - MAIN OFFICE—CHICAGO
NEW YORK OFFICE—50 Church Street

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)
"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."
W. S. Downing.
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.
1032 Garfield Building, CLEVELAND, OHIO
SELLING AGENTS
The Dominion Equipment & Supply Co., Winnipeg, Canada

Permanent Water Proofing of Concrete

The continual expansion and contraction of a concrete surface, due to varying temperature, will in a short time shed its waterproofing compound whatever it is.

Make your concrete waterproof right through by incorporating in your mixture

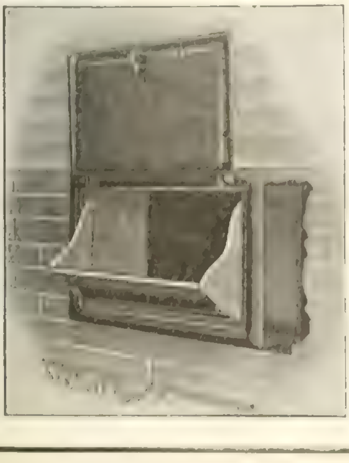
Guelph Hydrated Lime

which is very fine and fills all voids.

It improves the appearance of your job by producing a better color and it lessens the cost because it is cheaper than cement.

Specify **Guelph Hydrated Lime** when ordering from your dealer.

Standard White Lime Co.
Guelph, Ontario



EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No 1—22 x 16 x 13 No. 2—27 x 16 x 13 No 3—33 x 22 x 18

Send for our [illegible]

The Down Draft Furnace Co., Limited
Galt, Ontario, Can.

Montreal Representative: E. F. Dartnell, No. 8 Beaver Hall Square.

Ritchie Contracting & Supply Co.,

Limited

7th Floor Bower Building, 543 Granville Street,
VANCOUVER, B.C.

Manufacturers and Dealers in Building Materials and Contractors' Supplies

We carry in stock **Ransome Concrete Mixers** and parts.

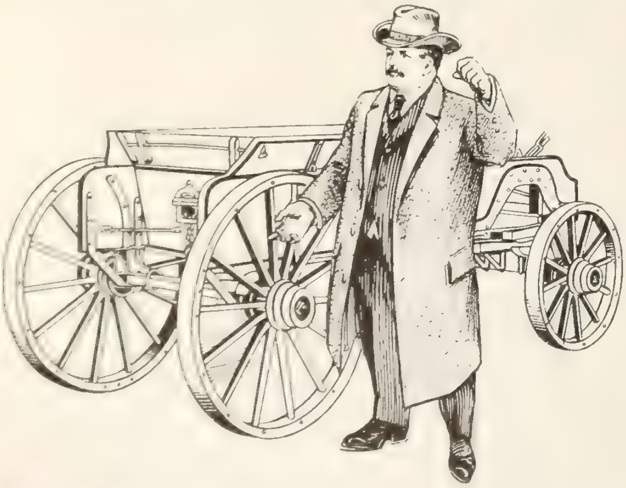
AGENTS FOR :—**Hart-Ottis Convertable Cars**
Davenport Locomotives
McCully Rock Crushers
Marion Steam Shovels
The Dominion Wire Rope

Write, phone, or call for prices and catalogues.

Our aim, prompt delivery.

Jim Fellowes Talks :—

Do you know that the Watson factory takes absolutely the cream from the product of the five largest spoke producers in this country? Do you know of any other dump wagon except the Watson that contains strictly "A" grade second growth White Oak spokes and nothing else? I don't. And I know pretty near what the market affords.



There is no mystery or witchery about good wheel making, but you **must** have high grade stock. After that comes skill in construction. Watson wheels are the result of 24 years devoted to building a single type of wagon.

Watson workmen are specialists on one type of wagon. They have to be, because nothing but dump wagons is made in the big Watson plant.

If this line of argument interests you, maybe you would like the 3 color booklet. It's free and it's worth while. Just address Jim Fellowes, Canastota, N. Y.

Watson Wagon Company, Canastota, N.Y.

The First Builders of Bottom Dump Wagons

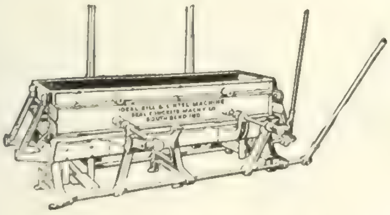
BRANCH OFFICES:
256 Broadway, New York, N.Y.
604 Witherspoon Bldg., Philadelphia, Pa.
806 Renshaw Bldg., Pittsburg, Pa.

IRON STAIRS

Dennis Wire & Iron Works Co.
London, Canada Limited
Toronto Offices - 12 QUEEN STREET E.

Cut shows a Brown Hoist Locomotive Crane at work on the New York Catskill Aqueduct. This crane is doing the excavating; placing the forms; handling the concrete in tubs; and covering up, besides the other miscellaneous work. *Catalogues are sent on request.*

The Brown Hoisting Machinery Co.
Main Office and Works, CLEVELAND, OHIO.



MR. CONTRACTOR!

you can make Dimension Stone
of almost any size with

'IDEAL' SILL-LINTEL and DIMENSION MACHINES

These illustrations show the possibilities of having "Ideal" Machines of your own.

They are not only suitable for making Sills, Heads, Lintels, String Courses and other ornamental work—but also in turning out your own Dimension Stone of almost any size, from white and colored brick for fireplaces, etc., to columns.

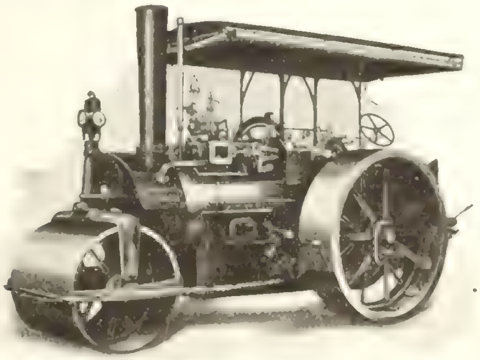
Write for catalogues, illustrating and describing these time saving, money-making machines which every Contractor and Builder should own.

IDEAL CONCRETE MACHINERY CO., LIMITED
Dept. B - London, Ont.

We can also supply Concrete Mixers, Ornamental Molds, Tile Molds, Fence Post Molds, Tyrete Waterproofing, etc.

Reliable and energetic agents wanted in every locality

"A Canadian Roller
for Canadian Roads"

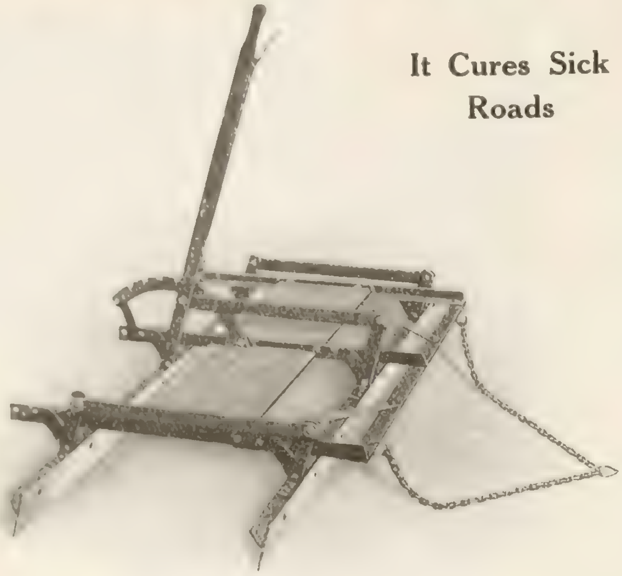


THE WATEROUS
DOUBLE CYLINDER
STEAM ROLLER

is built essentially to suit Canadian road building conditions. Over 100 Rollers in use in Canada to-day are proving their ability as road makers of the highest quality. A greater rolling capacity, with less cost of maintenance and operation, are its distinguishing characteristics. [illegible]

The Waterous Engine Works Co.
BRANTFORD, CANADA Limited
Agent: Hugh Cameron & Co., 72 Queen St. E., Toronto, Ont

Abrico Road Drag No. 1



It Cures Sick
Roads

Patented April 28, 1908

Length 8 feet. Width between blades 30 inches.
Blades 6 inches. Weight 300 pounds.

Do you want nice smooth roads?

This Drag will take out all of the **bumps** and fill up all the **ruts.**

It is of steel construction and is adjustable, both forward and backward, and can be operated by one man and team.

Do not let distance keep you from having one.

Your order by mail will be given careful attention.

Manufactured by

Attica Bridge Company

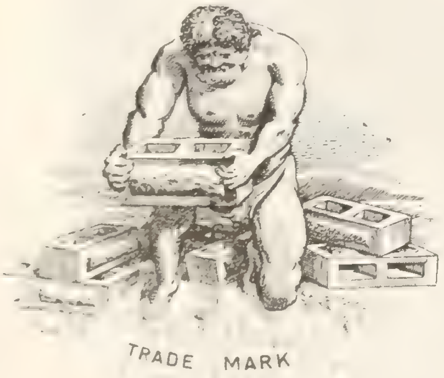
Attica, Indiana, U. S. A.

Canadian Representatives desired. Write for special terms.

HERCULES

Waterproofing and Strengthening Compound

A Practical, Efficient, Economical and Everlasting Material for Waterproofing and Strengthening Concrete (or Cement)



Absolute Impermeability

Increases Density Increases Strength

Hercules Waterproofing Compound

To be mixed with ordinary cement, a fine ground powder, which when mixed with the cement before the addition of the sand and water, not only renders the concrete waterproof, but increases its strength from 20 to 35 per cent.

Hercules Liquid Waterproofing

A thin, colorless liquid to be applied on set concrete with a brush, two coats being sufficient to render the concrete absolutely waterproof. One gallon covering about 150 square feet.

DISTRIBUTORS:

TORONTO—Ontario Lime Association, Ltd.
OTTAWA—D. J. MacKenzie.
WELLAND—David Dick & Sons.
NIAGARA FALLS—W. E. Thomas.

MONTREAL—Alexander Bremner, Ltd.
HAMILTON—Drake & Avery.
ST. CATHARINES—Wilson Lumber Co.

The Hercules Waterproof Cement Company

BUFFALO, N. Y., U. S. A.

Steel Bridges

and Concrete Work

For over a quarter of a century we have been building Steel Highway Bridges throughout Canada.

Our experience is at your disposal.

We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

Get our figures before closing your contracts.

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

The Contractor's "Money Saver"

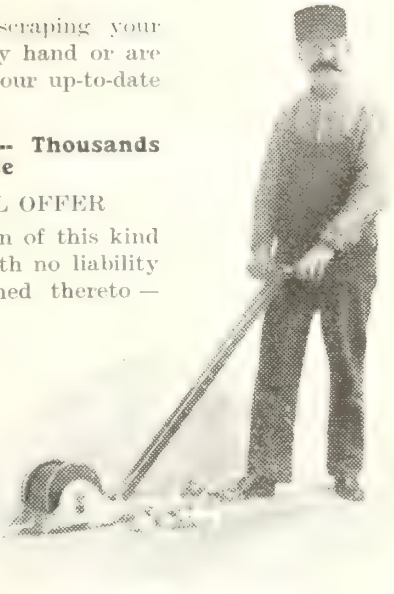
Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment --- Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto—write us **to-day.**

MACHINE
PAYS FOR
ITSELF
IN A FEW
DAYS.



"Little Giant Floor Scraper"

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

MODERN CONTRACTORS' PLANT

THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18″ x 26″ cylinder Mogul, Standard Gauge, and 18-10″ x 14″ Vulcan and Davenport dinkeys, 36″ Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36″ Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8″ Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag-Scrapers an 4—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36″ Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW

May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. and Dolland Lane - - MONTREAL, CANADA

Everything in Lumber for the Contractor

Fir, Hemlock, Spruce, Pine and Oak Timber and Lumber

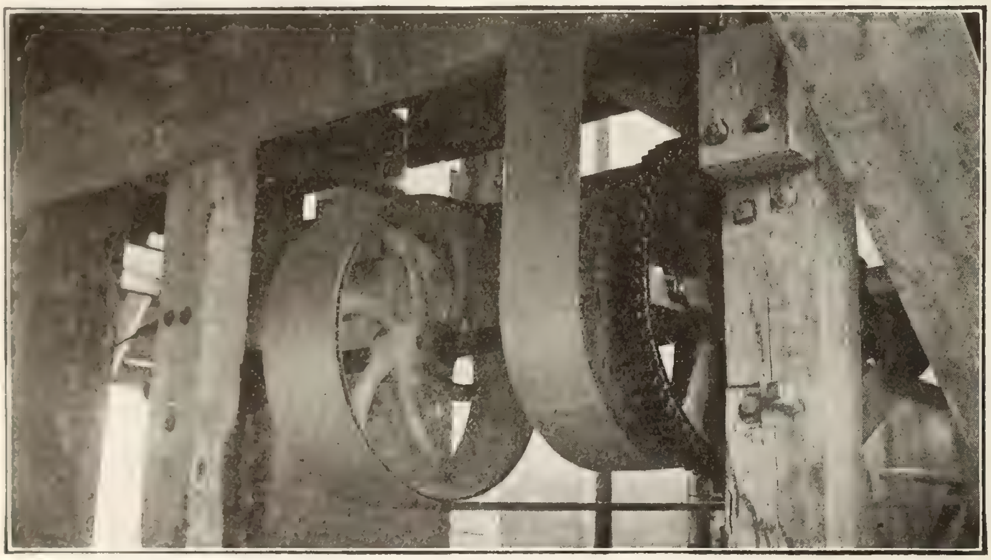
We specialize in

Southern Pine Timber and Piles

10,000 Green Tamarac Piles for Immediate Shipment. Get our Prices.

THE ELMITT LUMBER CO. LIMITED, OTTAWA, ONT.

SCANDINAVIA BELTING



These belts have been running exposed to the weather for two years.

They are giving excellent results.

We can give you a good belt and save you money.

FEDERAL ENGINEERING & SUPPLIES, LIMITED

Head Office, 284 Yonge Street, Toronto 329 St. James Street, Montreal

THE

Thames Quarry Co.

St. Mary's, Ont.

CRUSHED STONE

Rubble, Coursing and Dressed Stone

Lime Stone for Flux

JOHN BONIS, Manager

Office Phone 110a Res. Phone 110b

Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

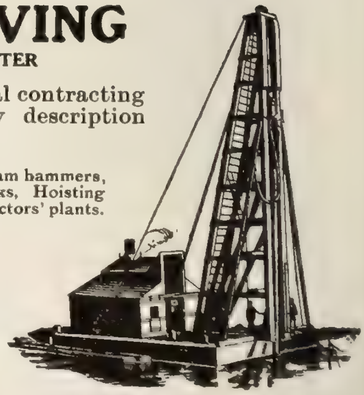
FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.



The

Missisquoi Marble Company
Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd. - -	Toronto, Ont.
C. N. Barclay - -	Winnipeg Man.
Bosse & Banks - -	Quebec, Que.
General Contractors Supply Company, Ltd. -	Halifax, N. S.
129 Sparks Street - -	Ottawa, Ont.
James Robertson Co. Ltd. -	St. John, N. B.
G. R. Duncan - -	Fort William, Ont.
Walker & Barnes - -	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd. -	Vancouver, B. C.
315 Coristine Building -	Montreal, Que.

Glenboig Brick
For Building

GLENBOIG
Every Glenboig Brick bears the brand
GARTCOSH

There is no brick made that will withstand climate changes, effects of time and erosion like the famous "GLENBOIG" made from the natural product without sand.

Specify "GLENBOIG BRICK" on your next job.

MAKER'S SELLING AGENT

Alexander Gibb
13 St. John St. - MONTREAL, Que.

The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another.

Tide Water Iron Works
HOBOKEN, N.J. U.S.A.

Builders' Supplies

Mouldings
Turnings
"Empire Brand"
Hardwood Flooring
Stair Building
Interior Trim
Sash
Veneered Doors
Pine Doors

J. R. Eaton & Sons
Limited
Orillia, Ontario

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North {604 / 605} Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C. P. R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale: –

	Star.	D.D.
10 to 25 united inches.......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES

(Installed in Toronto).

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite, 55 cents per square foot.

Viterous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 4 compression bath cock ....net	$1.65
No. 4½ Fuller's ....net	2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

PAINTS AND OILS

(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

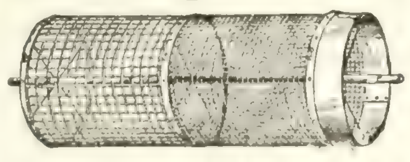
Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, 8cc per gallon.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Brown sills and heads, in the rough, delivered, 40 cents per foot.

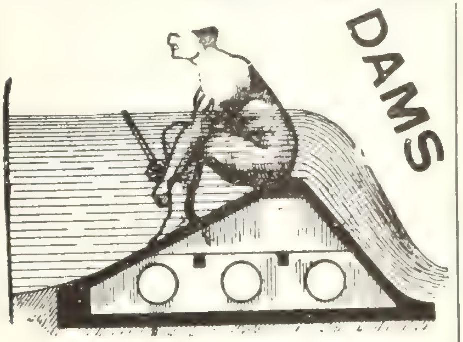
Rubble stone in car lots, $1.30 per ton.



We manufacture
Revolving Screens
and anything in the screen line.
Also railings, wire guards, grills etc.
Electro-plating and all metal finishes.
Estimates Given - **Send for Catalogue**
Crescent Wire & Iron Works
Partridge & Sons **KINGSTON**

Bonds of Suretyship for Officers and Employees in positions of trust.
Bonds Bid and Supply in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies
The
Guarantee Company of North America
The Pioneer Company *Established [illegible]*
Head Office - **Montreal**
Capital and Resources over $1 965,000
Claims Paid over - - - $2 265,000
No Claims in Dispute
This Company is not a party to any premium tariff combination

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager. Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

DOMINION BRIDGE CO.

LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.

Limited

Darlington, England

Bridges

and

Steel Structures

Canadian Offices:

Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.

——Bridge and Construction Dep't.——

Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter
River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS and CONTRACTORS

Water Washed Sand
Crushed Granite
Crushed Lime Stone

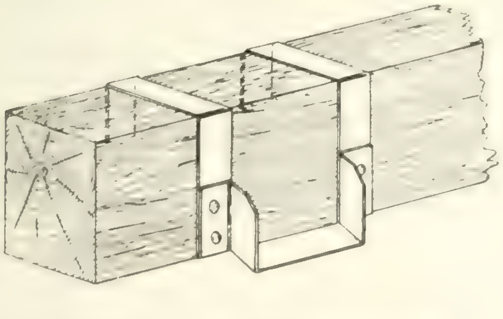
Prompt Attention Given Orders at Our Dock Spadina Ave.
PHONES
Office - Adel. 1947
Yard - Adel. 1948

SAND & SUPPLIES, LIMITED
TORONTO

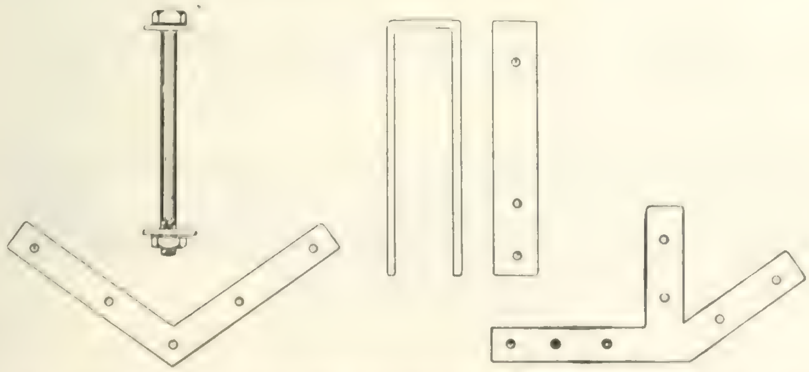
The
Phœnix Bridge & Iron Works
MONTREAL Limited
General Steel Contractors
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

Portland Cement
High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.
Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company, Ltd.
HAMILTON, ONT.



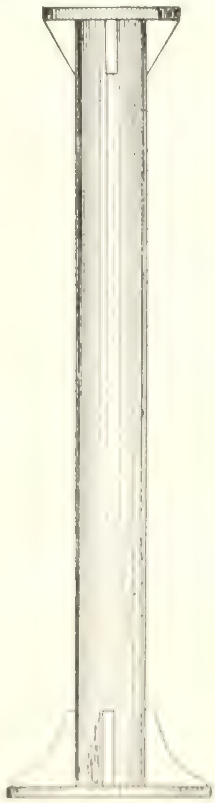
STEEL JOIST HANGERS, Single or Double



IRON FORGINGS, for Wooden Trusses, Apex Straps, Stirrups, Bolts and Rods made to order

Beams, Angles, Channels, Plates,

All Size from 1½ inch to 24 inches, and any length up to 70 feet.



CAST IRON COLUMNS
all sizes and designs

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners
Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.

Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

JAMES THOMSON, President. J. G. ALLAN Vice-President. JAMES A. THOMSON, Secretary.

THE CARTSHORE-THOMSON PIPE & FOUNDRY CO.

LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments **Works and Offices: Ashbridge's Bay, TORONTO**

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power
Civil Engineers
TORONTO WINNIPEG
Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN
CONSULTING ENGINEERS
STEAM, ELECTRIC AND HYDRAULIC POWER
43 KING ST. WEST - TORONTO

T. Harry Mace
ENGINEER
Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete
630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.
Bowman & Connor
Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae
CONSULTING ENGINEER
Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON
ENGINEERS
Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.
405 Dorchester Street East, MONTREAL

John. T. Farmer
MECHANICAL AND HYDRAULIC ENGINEER
427 Coristine Bldg., Montreal

EDW. O. FUCE
Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor
CIVIL ENGINEER
GALT - ONTARIO
Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell
Consulting and Supervising Engineers
Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants
Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.
A.M. Can. Soc. C.E. A.M. Am. Soc. C.E.
Consulting Civil and Municipal Engineer
SPECIALTIES
Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.
315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C.E.
Consulting Engineer
Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work
1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY
Mem. Can. Soc. C.E.
Civil and Hydraulic Engineer
Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.
Suite 413, Pacific Block, Vancouver, B. C.

JOSEPH N. ROULEAU
Submarine Diver
Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.
793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.
Consulting, Civil and Sanitary Engineers
General Municipal Engineering
Specialties: { Waterworks, Sewerage and Electric Lighting.
Winnipeg and Calgary
John Haddin E. L. Miles

Allan Keefer
Architect
Ottawa, Ontario

Arthur L. Weeks
Architect
Canada Life Building, Ottawa
Reinforced concrete and steel structures, factories and commercial buildings

NADEL & ADLER
375 St. James St., MONTREAL
The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

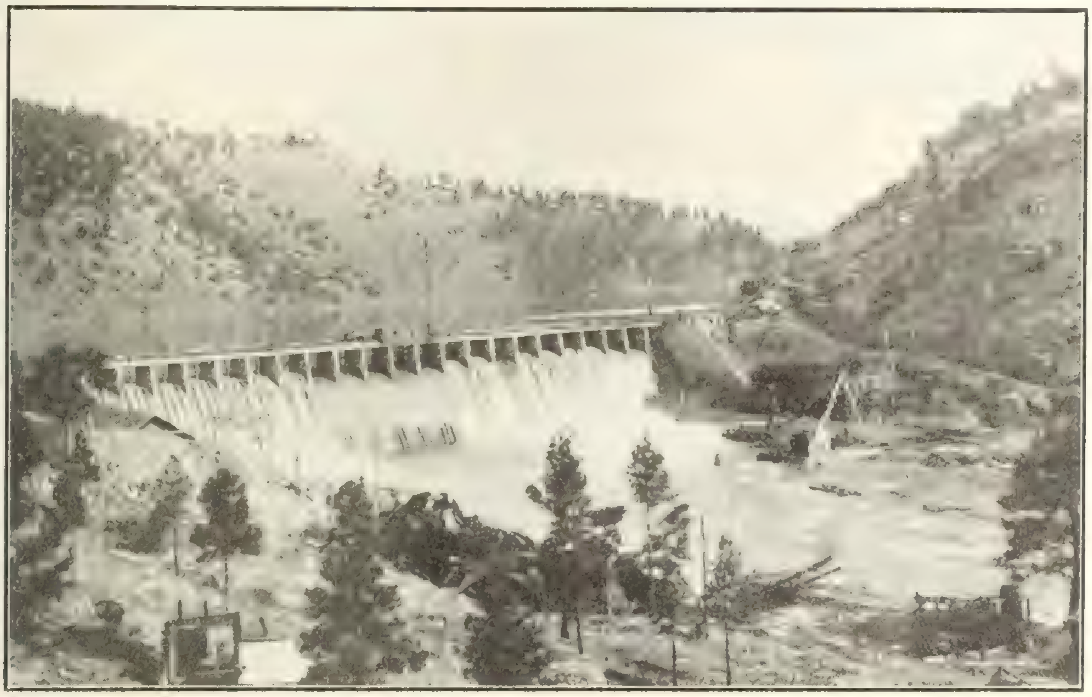
Jas. A. McIlwraith
General Contractor
For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.
COLLINGWOOD, ONT.

TRADE MARK TAMCO
FOR SALE
"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The
Laurentian Granite Co.
Limited
MANUFACTURERS OF
Building Granite, Granite Setts, Curbing, Etc.
Samples Furnished and Prices Quoted on Application
Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.
Bank of Ottawa Bld'g. 224 St. James St. Montreal
Bell Tel. M. 4354

Rails for Contractors, Switches, Girders, etc. New and Second Hand.
Locomotives and Cars
JOHN J. GARTSHORE
58 Front Street W., TORONTO

THE FOUNDATION COMPANY
LIMITED
Bank of Ottawa Building - Montreal, Canada



WE MAKE A SPECIALTY OF

Water Power Construction
Power Plants, Dams

Our Scope

BRIDGE PIERS,
MINING SHAFTS,
TUNNELS,
WATER POWER CONSTRUCTION,
POWER PLANTS

SEAWALLS,
WHARVES, QUAYS,
DAMS,
LIGHTHOUSES,
HEAVY BUILDING FOUNDATIONS.

WITH A LARGE EQUIPMENT OF PLANT AND A WELL-ORGANIZED FORCE WE ARE PREPARED AT ALL TIMES TO UNDERTAKE DIFFICULT WORK ON THE SHORTEST NOTICE

We Invite Inquiries in Reference to Cost and Design of Difficult Foundation Work.

Barrett Specification Roofs

Anheuser-Busch Plant, St. Louis.
Roofing built by the
St. Louis Roofing Co.

Over 50 Years of Satisfaction

When big roofs are under consideration, ultimate costs are carefully figured. Barrett Specification Roofs win on the figures every time and for that reason most of the large manufacturing plants in the county carry roofs laid along the lines of this specification.

The enormous plant illustrated above is a typical instance. It is the Anheuser-Busch Brewery at St. Louis, covering 70 acres, equal to 35 city blocks. 99% of these buildings are roofed with coal tar pitch, tarred felt and gravel laid along the lines of the Barrett Specification, the other 1% being steep or ornamental roofs.

The durability of these roofs has averaged over 20 years and the net cost per square foot per year of service has been lower than that of any other roofing material.

The Anheuser-Busch people have had plenty of time to find a better and more economical roof covering if there was any, for they have been using gravel roofs of this type since 1852.

Whenever the area is large enough to set engineers and architects to looking up ultimate roofing costs, Barrett Specification Roofs are invariably used.

The Barrett Specification will be furnished free on request to anyone interested. Address our nearest office.

The Paterson Manufacturing Co., Limited

Montreal Toronto Winnipeg Vancouver St. John, N.B. Halifax, N.S.

Canada Wire & Cable Co., Ltd.

Announce the Opening of their New

Wire, Cable, and Wire Rope Works

at Toronto

The Product of our Electrical Wire Department will include

Electrical Wires and Cables

in Aluminum and Copper

BARE AND INSULATED—FOR ALL PURPOSES.
GALVANIZED IRON TELEGRAPH AND TELEPHONE WIRE

The Product of our Wire Rope Department will include:

- Standard Hoisting Ropes
- Semi-Pliable, Pliable and Extra Pliable Ropes
- Improved Patented Cruicible Cast Steel Hoisting Ropes
- Improved Mild Steel (Siemens-Martin) Elevator Ropes
- Transmission and Colliery Ropes
- Tiller Ropes
- Galvanized Steel Hausers
- Galvanized Strand 2, 3 and 7 wire for Guys
- Ropes to any Standard Specification

Literature ready for distribution at an early date. Write for it

CANADA WIRE & CABLE CO.

LIMITED

Factory at
1160-70 Dundas Street
Toronto

HEAD OFFICE
KENT BUILDING, 156 YONGE STREET,
TORONTO

HOISTING

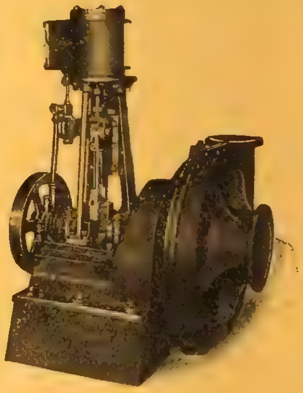
ENGINES

We can furnish hoists designed to suit every purpose; our hoists give the maximum results with a minimum cost.

Steam - Belt Driven
and Electric **HOISTS**

of all capacities for prompt shipment

Centrifugal Pumps



either with direct connected engine or belt driven

We carry all sizes of centrifugal pumps in stock ready for immediate shipment.

Derricks Concrete Mixers Crushers

F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.
GORMAN, CLANCEY & GRINDLEY, LTD., Calgary and Edmonton Agents

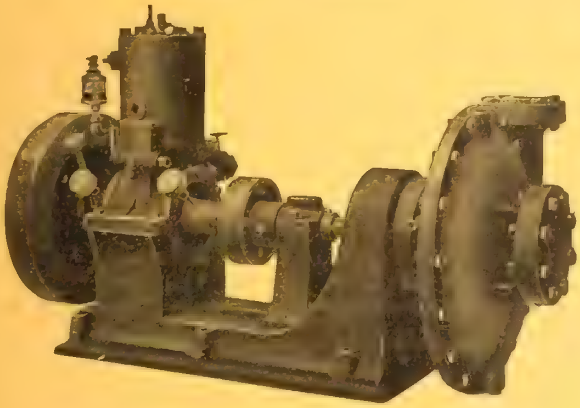
Vol. 25 Toronto, August 2, 1911 No. 31

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

We manufacture Steam and Power Pumps, Condensers, Travelling Cranes, etc.
Write for Catalogue



The Smart-Turner Machine Company
HAMILTON, ONTARIO Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: 91 to 133 Don Roadway
TORONTO

Distinguished Work

"Queen's Head"

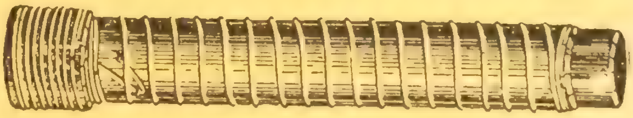
CANADA

Galvanized Iron

Will give your work that clean, bright appearance so much desired

John Lysaght, Limited
Makers
Bristol, Newport

A. C. Leslie & Co., Limited
MONTREAL
Managers, Canadian Branch



Continuous and Machine Banded Wood Stave

WATER PIPE

RESERVOIR TANKS

for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

---

EACH ONE OF SIX

"AMERICAN" STIFF LEG DERRICKS

installed on the Roosevelt Dam, Roosevelt, Ariz., set 135 cubic yards of material per day of 8 hours.

85 yards per derrick per day OVER government estimate.

Contractors, M. J. O'Rourke & Co., Roosevelt, Ariz.

Send us full information and let us figure on your requirements.

Write Dept. 6.

Name

Address

Please send information and prices
on "American" Derricks and
AMERICAN HOIST &
DERRICK CO.
St. Paul, Min.
C R 8-2-11

American Hoist & Derrick Company

ST. PAUL, U.S.A.

Gorman, Clancey & Grindley	Edmonton and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot, Ltd.	Vancouver, B.C.
J. L. Neilson & Co.	Winnipeg, Man.
Dunn Brothers	Winnipeg, Man.
J. A. McTaggert	Winnipeg, Man.

When making specifications keep these facts in mind about Canada Cement

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

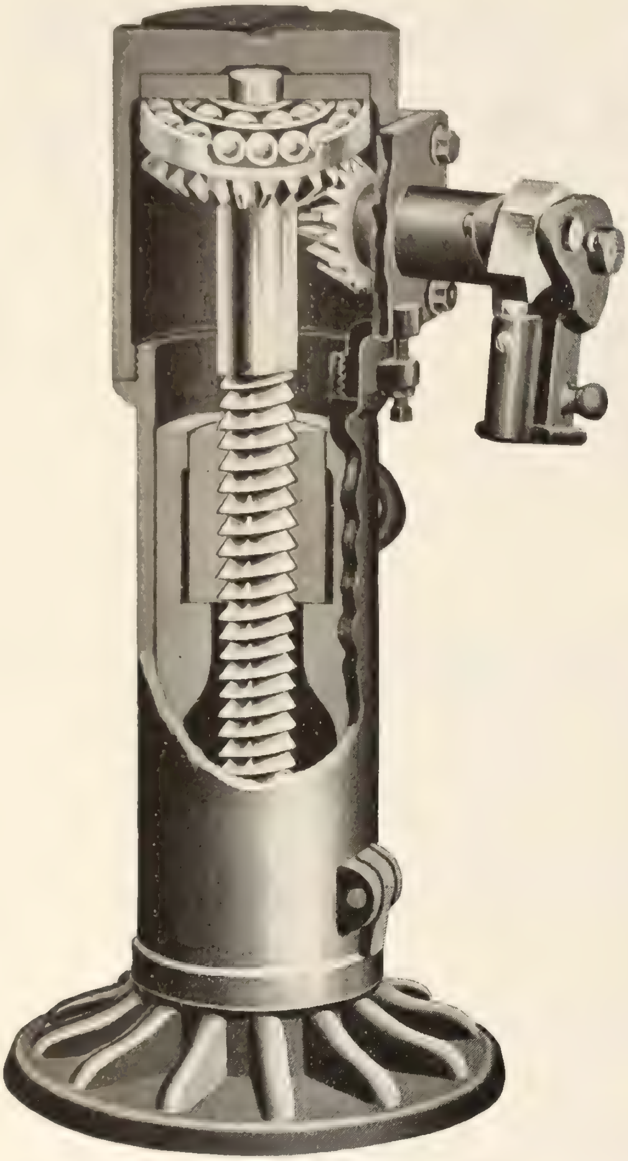
Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

CANADA CEMENT COMPANY LIMITED
PORTLAND
CANADA
CEMENT
MONTREAL

Canada Cement Company, Ltd.

MONTREAL - TORONTO - WINNIPEG - CALGARY



NORTON JACKS

All Sizes and Styles

10 to 70 Tons

Carried in Stock

Ball Bearing and Cone Bearing
Car Jacks Track Jacks

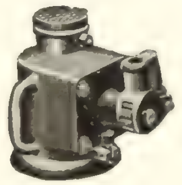
Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

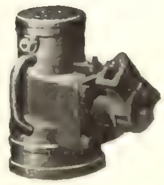
MUSSENS

JACKS

or All Purposes

Norton Jacks are Standard





Norton Jacks are Guaranteed

SEND FOR CATALOGUE

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects

	Page
[illegible]	[illegible]
Weeks, Arthur L.	93

Architectural Iron Work

Canada Wire Goods Mfg. Co.	74
Dennis Wire & Iron Works	[illegible]
Meadows Co., Geo. B.	[illegible]

Air Compressors

Escher Wyss & Co.	

Air Valves, Automatic

Marsh, J. P.	82

Asphalt Plant

[illegible] Iron Machine Co.	73

Buckets

American Hoist & Derrick Co.	2
Sackett Screen & Shute Co.	90

Belting

Federal Engineering & Supplies, Ltd	80

Blowers

Sturtevant Co., B. F.	33

Boilers

Inglis, John	67
Jenckes Machine Co.	2
Leonard & Sons E.	73
Marsh & Henthorn	71
McDougall Caledonian Iron Works	69
Mussens Limited	4
Waterous Engine Works Co.	77

Brick Machinery and Supplies

Berg Mfg. Co.	
Wert C. S.	69
Whitehead, John	88

Brick

American Enamelled Brick Co.	
Don Valley Brick Works	7
Hamilton Pressed Brick Co.	
Milton Pressed Brick Co.	27
Port Credit Pressed Brick Co.	86
Toronto Pressed Brick Co.	93

Brickmaker's Supplies

Sackett Screen & Shute Co.	90

Bridges (Steel)

Attica Bridge Co.	
Canadian Bridge Co.	84
Cleveland Bridge Co.	84
Des Moines Bridge and Iron Co.	89
Dickson Bridge Works	
Dominion Bridge Co.	84
Hunter Bridge and Boiler Works	79
Phoenix Bridge and Iron Works	85
Pennsylvania Steel Co.	84

Cement

Alsen Portland Cement Co.	74
Britnell & Co.	80
Bremner, Alex.	87
Canada Cement Co.	3
McNally & Co., W.	85
Morrison & Co., T.A.	92
Rogers, Alfred Limited	9

Concrete Pipe

Dominion Concrete Co.	22
Lock Joint Pipe Co.	14

Cement Waterproofing

Ceresit Waterproofing Co.	
[illegible]	19
Hercules Waterproofing Cement Co.	
[illegible]	[illegible]

Cranes, Travelling & Locomotive

	Page
American Hoist & Derrick Co.	2
Armstrong, H. J.	
Brown Hoisting Machinery Co.	77
Males Co.	64
Parker, S. E.	20
Willis Shaw Machinery Co.	64

Conduits

Conduits Co., Limited	87

Crushed Stone and Granite

Sand and Supplies	85

Concrete Mixers and Machinery

Canada Foundry Co.	20
General Machinery Co.	
Gould, Shapley & Muir	16
Hopkins & Co., F., H.	96
Ideal Concrete Machinery Co.	
Jenckes Machine Co.	2
London Concrete Machinery Co.	35
Milwaukee Mixer Co.	16
Mussens Limited	4
Morrison & Co., T. A.	92
Steel and Radiation (Cement Gun)	23
Standard Scale	24
Vining Bros.	90
Wettlaufer Bros.	10
Wert C. S.	69

Contractors' Plant

American Hoist & Derrick Co.	2
Acme Eqpt. & Engineering Co.	75
Beatty & Sons, M.	6
Hepburn, John T.	12
H. & E. Lifting Jack Co.	
Hopkins & Co., F.H.	96
International Marine Signal Co.	8
Willis Shaw Machinery Co.	64
Marsh & Henthorn	71
Montreal Locomotive Works	32
Mussens Limited	4
Parker, S. E.	20
Ritchie Contractors Supply Co.	89
Tiffin Wagon Co.	
Troy Wagon Works	33
Watson Wagon Co.	76
Wert C. S.	69

Crushers (Stone and Rock)

Berg Machinery Co.	
Hopkins & Co., F. H.	96
Jenckes Machine Co.	2
London Concrete Machinery Co.	35
Males Co.	64
Mussens Limited	4
Morrison & Co., T. A.	92
Willis Shaw Machinery Co.	64

Corrugated Iron

Galt Art Metal Co.	91
Metallic Roofing Co.	71
Metal Shingle and Siding Co.	
Ormsby, A. B., Limited	11
Roofers Supply Co.	87

Contractors

Bennett, Robt.	
Foundation Co.	
Holmes, Fred.	
McIlwraith, Jas. A.	83
Nadel & Adler	92
Wells & Gray	

Coal Handling Apparatus

American Hoist & Derrick Co.	2
Down Draft Furnace Co.	75
Parker, S. E.	20

Derricks and Derrick Fittings

American Hoist & Derrick Co.	2
Parker, S. E.	20

Drills

	Page
Beatty & Sons M.	6
Canadian Rand Co.	

Drilling Contractors

Harvey, J.	83

Dredges

Beatty & Sons, M.	6
Males Co.	64
Willis Shaw Machinery Co.	64

Dry Kilns

Sturtevant Co., B. F.	33

Electrical Apparatus, Motors

Canada Ford Co.	36

Engines

Canadian Boving Co.	88
Inglis, John	67
Jenckes Machine Co.	2
Leonard & Sons, E.	73
Mussens Limited	4
Sturtevant Co., B. F.	33
Waterous Engine Works Co.	77

Engineers (Civil) and Mechanical

Barber & Young	92
Chipman & Power	92
Bowman & Connor	92
Farmer, John T.	92
Fuce, Edw. O.	92
Galt Engineering Co., John	92
Glaubitz, H. J.	92
Hancock, H. Syd.	92
Inglis, John	67
Kennedy, Jas. C.	92
Lea & Ferguson	92
Mace, T. Harry	92
Mitchell, C. H.	92
McRae, John B.	92
Moore & Scollan	92
Taylor, James	92

Exhaust Heads

Sturtevant Co., B. F.	33

Filters

American Water Softener Co.	93

Floor Scrapers

Hurley Machine Co.	79

Friction Clutches

Berg Machinery Co.	

Field Instruments

Consolidated Optical Co.	34
Gurley, W. & L. E.	70

Fire Brick

Gibb, Alexander	81

Fire Apparatus

Morrison & Co. T. A.	92
Seagrave, W. E.	80

Fireproof Doors and Windows

Douglas Bros.	18
Mussens Limited	4
Ormsby, A. B.	11
Steel and Radiation	23

Gauges, Steam, etc.

Marsh, Jas. P.	82

Granite and Marble

Laurentian Granite Co.	83
Missisquoi Marble Co.	81
Smith Marble & Construction Co.	91

Glass

	Page
Consolidated Plate Glass Co.	
Luxfer Prism Co.	78
Toronto Plate Glass Importing Co.	1

Hoists (Hand Gasoline and Electric)

Parker, S. E.	20

Heating Apparatus

Jenckes Machine Co.	2
Leonard & Sons, E.	73
Steel and Radiation	23

Hoisting Machinery

American Hoist & Derrick Co.	2
Beatty & Sons, M.	6
Canada Ford Co.	36
Inglis, John	67
Jenckes Machine Co.	2
Hopkins & Co., F. H.	96
London Gas Power Co.	73
Marsh & Henthorn	71
Mussens Limited	4
Parker, S. E.	20
Sturtevant Co., B F.	33

High Pressure Pipe Lines

Escher Wyss & Co.	

Hydrants

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co.	86
Kerr Engine Co.	29

Interior Finish and Doors

Anglin, S.	74
Brennen & Sons, M.	90
Batts Limited	
Canada Office & School Furniture Co	
DeLaplante, Ltd.	81
Bryan Mfg. Co.	69
Eaton & Sons, J. R.	81
Elmitt Lumber Co.	80
Georgian Bay Shook Mills	
Rhodes Curry & Co.	
Wilson Bros.	76

Locomotives

Montreal Locomotive Works	32

Metal Forms for Concrete

Reichert Mfg. Co.	25

Lime

Christie, Henderson & Co.	82
Jamieson Lime Co.	
Ontario Lime Association	91
Standard White Lime Co.	75

Metal Lath

Galt Art Metal	91
Metallic Roofing Co.	71
Noble C. W.	74
Steel and Radiation	23

Meters

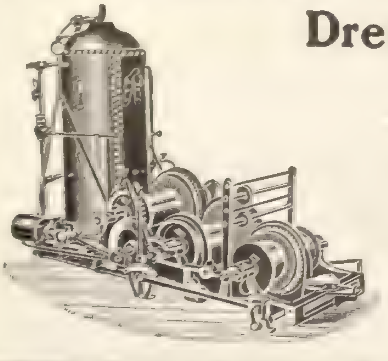
Hopkins & Co., F. H.	96
McDougall Caledonian Iron Works	69
Neptune Meter Co.	

Paving and Paving Materials

Dominion Carbolineum Works	17
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	74
Shawmut Paving Brick Co.	72
Silica Barytic Stone Co. of Ontario	83

(Continued on page 10)

M. Beatty & Sons, Limited **Welland, Ontario, Canada**



Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows
Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Engineers and Builders

OF ALL

Steel and Iron Structures

Mill Buildings our Specialty. Roofs, Bridges, Columns and Girders of Every Description. Large Stock of Structural Shapes always on hand for immediate shipment. Ask for Designs and Estimates on your Work.

International Marine Signal Company Limited

OTTAWA, CANADA

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, **Sackville, N. B.**

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Page
Albert Mfg. Co.	
Britnell & Co	82
[illegible] H. W	86

Portable Saw

Canadian Fairbanks	2

Pipe

American Spiral Pipe Works	[illegible]
Canadian Pipe Co	86
Dominion Wood Pipe Co	12
Dominion Concrete Co	22
Gartshore Thomson Pipe Co	86
Lock Joint Pipe Co	14
[illegible] & Co	11
National Iron Works	87
Pacific Coast Pipe Co	1
Pedlar People	30
Steel Co of Canada	19
Steel and Radiation	23

Plumbers' Supplies

Standard Ideal Co	30

Power Engines

Inglis Co., John	67

Paints and Varnishes

Paterson Mfg. Co.	94

Pile Driving Machinery

American Hoist & Derrick Co...	2
Lincoln Construction Co.	80

Pumps and Pumping Machinery

American Well Works	72
Beatty & Sons, M	6
Cook, A D	93
Escher Wyss & Co.	
Hopkins & Co., F. H.	96
Inglis Co., John	67
Leonard & Sons, E	73
McDougall Caledonian Iron Works..	69
Mussens Limited	4
Ontario Wind Engine & Pump Co.	
Smart-Turner Machine Co.	1
Waterous Engine Works Co	77

Roofing Materials

	Page
Asbestos Mfg. Co.	24
Galt Art Metal Co.	91
Metallic Roofing Co.	71
Metal Shingle & Siding Co.	
Noble, Clarence W	74
Paterson Mfg. Co.	94
Philip Carey Co	
Roofers Supply Co	87
Standard Paint Co.	28

Railway Supplies

Gartshore, John J.	92
Hopkins & Co., F. H.	96
Mussens Limited	4

Reinforcements, Concrete and Steel

Ambursen Hydraulic Construct'n Co.	83
Canada Wire Goods Mfg. Co.	73
Concrete Form Engine Co.	33
Steel Co. of Canada	19
Steel & Radiation	23
Trussed Concrete Steel Co.	73
Turner, C. A. P.	76

Road Machinery

Hamilton Machinery Co.	15
Morrison & Co., T. A	92
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co.	20
Hopkins & Co., F. H.	96
Montreal Locomotive Works	32
Mussens Limited.	4
Males Co.	64
Willis Shaw Machinery Co.	64

Stone

Anderson, Geo	18
Britnell & Co.	82
Brodie, Jas.	
Christie, Henderson & Co.	82
Consolidated Stone Co.	89
Contractors' Supply Co.	82
Corinthian Stone Co.	
Crushed Stone, Limited	73
Doolittle & Wilcox	87
Hagersville Contracting Co.	11
Laurentian Granite Co.	83
McMillan & Son, R.	
Morrison & Co., T. A.	92

Stone

	Page
Myers, Oakley	73
Roman Stone Co	13
Sackville Freestone Co.	8
Sand & Supplies	85
Thames Quarry Co.	80

Sand and Gravel

Rogers Supply Co.	31
Sand & Supplies	85

Steam Apparatus

Sturtevant Co., B. F.	33

Submarine Diver

Rouleau, Joseph N.	92

Structural Iron and Steel

Dominion Bridge Co.	84
Steel Co. of Canada	19
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	83
Salter, W. H.	85
Steel & Radiation	23

Sewer Pipe

Britnell & Co	82
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
Gartshore Thomson Pipe Co.	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	14
National Iron Works	87
Ontario Sewer Pipe Co.	21
Standard Drain Pipe Co.	21

Slate

Roofers Supply Co.	87

Steel Shingles and Ceilings

Galt Art Metal Co.	91

Smoke Stacks

Leonard & Son, E.	73

Tents

Woods Limited	25

Safes and Vaults

Taylor, J & J	90

Testing and Inspection Bureau

	Page
Hunt & Co., Robt. W.	73

Tiles

Smith Marble & Construction Co.,	91

Tanks and Stand Pipes

Berg Machinery Co.	
Inglis, John	67
Jenckes Machine Co.	2
Leonard & Sons, E.	73
Marsh & Henthorn	69
McDougall Caledonian Iron Works..	67
Ontario Wind Engine & Pump Co.	89

Trade Journals

Castellanos A. W.	89

Valves

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co.	86
Kerr Engine Co.	29
Marsh & Co, Jas.	82

Ventilating and Heating Apparatus

Sturtevant Co., B. F.	

Water Softeners and Filters

Berg Machinery Co.	
American Water Softener	93

Wire Rope

Canada Wire and Cable Co.	95
Greening Wire Co., B.	68
Smith, Thos. & Wm.	
Steel Co. of Canada	19

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	73
Crescent Wire Iron Works.	
Greening Wire Co B.	68
Sackett Screen & Shute Co	90
Steel and Radiation	23

Water Wheels

McDougall Caledonian Iron Works.	69
Canadian Boving Co.	88

Water Turbines

Escher Wyss & Co.	

Wires and Cables

Canada Wire and Cable Co.	95

Wheelbarrows

Sackett Screen & Shute Co.	90
Parker, S. E.	20

It's That Heart-Shaped Drum

That makes the Wettlaufer mixer so efficient and popular. These mixers are extremely simple and not only mix the concrete in a minimum time but discharge the material quickly.

The largest concrete workers and contractors in Canada are using our mixers. We have piles of letters of approval which we will be pleased to show you.

Our catalogue will interest you.

Wettlaufer Bros.

178 Spadina Ave.
TORONTO
A. R. Williams Machinery Co.,
15 Dock St., St. John, N. B.
W.E. Ransome, Moose Jaw, Sask.

MUNDERLOH & Co. Ld.
MONTREAL.

SEAMLESS STEEL TRACTION AND LIGHTING POLES.

MANNESMANN SEAMLESS STEEL PIPES. FOR GAS & WATER MAINS.

IN LENGTHS UP TO 40 FEET.
AN IMPROVEMENT ON CAST IRON.
ALL PIPES TESTED 75 ATMOSPHERES BEFORE LEAVING WORKS.

WRITE US FOR ILLUSTRATED BOOKLET.
SEND US YOUR ENQUIRIES.

WE ARE SOLE AGENTS IN CANADA FOR—
MANNESMANN TUBES.
FOR ALL PURPOSES.

THE STRENGTH OF OAK WITH 40 PER CENT SAVING IN WEIGHT

That's the saving effected by constructing the bed of selected Washington Fir, and its just one of the many reasons why lightest weight is combined with greatest strength in the

"Aurora" Dump Waggon

Built low for easy loading, coupled short for lightest draft only 7 feet 4 inch wheel base.

Chains entirely outside of bed, direct pull of chain on doors and length of chains adjustable.

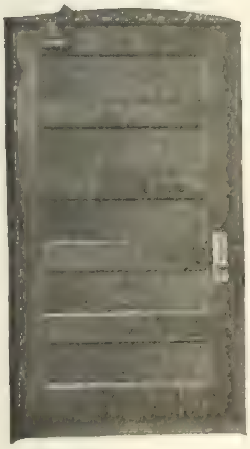
Slotted hinges on doors give vertical movement, preventing installing team on dump.

Study its sturdy construction—its mechanical, labor-saving and dependable qualities. Catalog for the asking.

Western Wheeled Scraper Co.
Earth and Stone Handling Machinery Aurora, Ill

WE GIVE YOU

Appearance and Finish



When we install our **Kalameined Clad Fireproof Doors** for you, we give you really **Fireproof Doors** that are as fine looking as any kind of a wooden door. They have a very fine appearance and you can finish them to any color scheme. If finished in Mahogany they cannot be told from the real thing. Our goods are **machine made.** There is no bulging, no nail heads or seams. Send us your details and let us quote you a figure.

A. B. Ormsby, Limited
Experts in Fireproof Windows and Doors
Factories: - - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

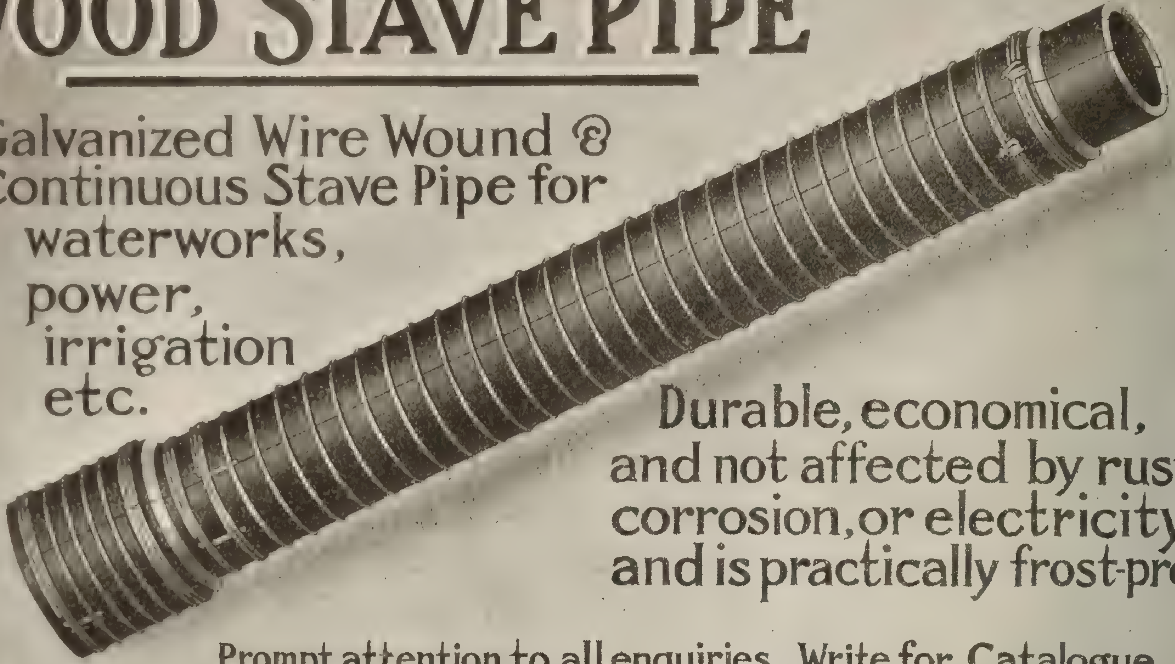
Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R. and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

WOOD STAVE PIPE



Galvanized Wire Wound & Continuous Stave Pipe for waterworks, power, irrigation etc.

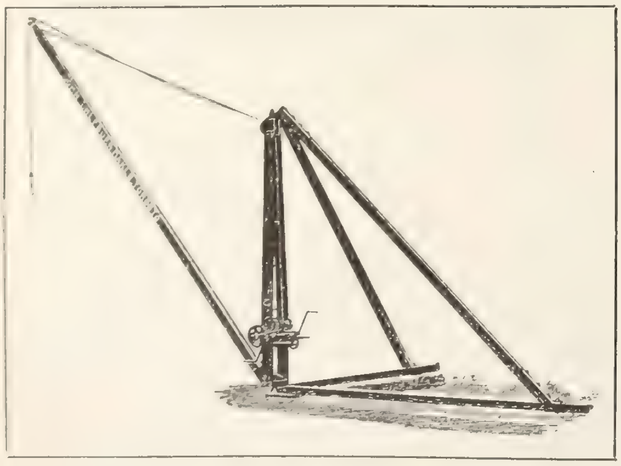
Durable, economical, and not affected by rust, corrosion, or electricity, and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

A Saving of Time and Labour

Time is Money. Labour costs Money. Anything that means saving of Time and Money is well worth looking into.



Hepburn Scotch Derricks

effect a Labour Saving of fully 50 per cent. over the old style derrick—with greatly increased efficiency.

Increased efficiency and reduced operating cost, means more work and better work in less time and with less labour—means greater capacity—more business—larger margin of profit.

We make "Efficient" Derricks of all kinds and for all purposes.

Others use Hepburn Derricks because they find it pays to use the best. It will pay you too. Write to-day for particulars.

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company
Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

Manufacturing 60 inch pipe for the Low Level Interceptor, Toronto.

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

Write for Illustrated Catalog

QUEBEC AND ONTARIO
Francis Hankin & Co.
231 Coristine Bldg., Montreal
199 Yonge St., Toronto

MANITOBA, SASKATCHEWAN AND ALBERTA
F. H. McGavin Company Limited
103 Osborne St., Winnipeg

BRITISH COLUMBIA
Pacific Lock Joint Pipe Co.
1005 A St. Tacoma, Wash.
Globe Bldg., Seattle.

'Champion' Road Machinery

Leads all Others

Good design will never compensate for structural weakness.

Structural strength will never make a poorly designed machine good.

It is only when Road Machinery is **right in every respect** that it can be trusted to do all that is expected of it under all conditions.

"Champion" Road Machinery leads all others because it has no weaknesses to offset its invaluable, exclusive features.

"CHAMPION" Rock Crushers

"CHAMPION" Graders

"CHAMPION" Sprinklers and Sweepers, etc.

have born the champion reputation for over 20 years. Write for the catalog before you buy—tell us which machine interests you and we will give full information.

Save 3 to 5 days on Repair Parts

Order all repair parts direct of the Hamilton Machinery Co., 144 York St., Hamilton. By sending direct you will save from 3 to 5 days in shipment of your order.

Manufactured by

American Road Machine Co., of Canada, Limited

GODERICH, ONT.

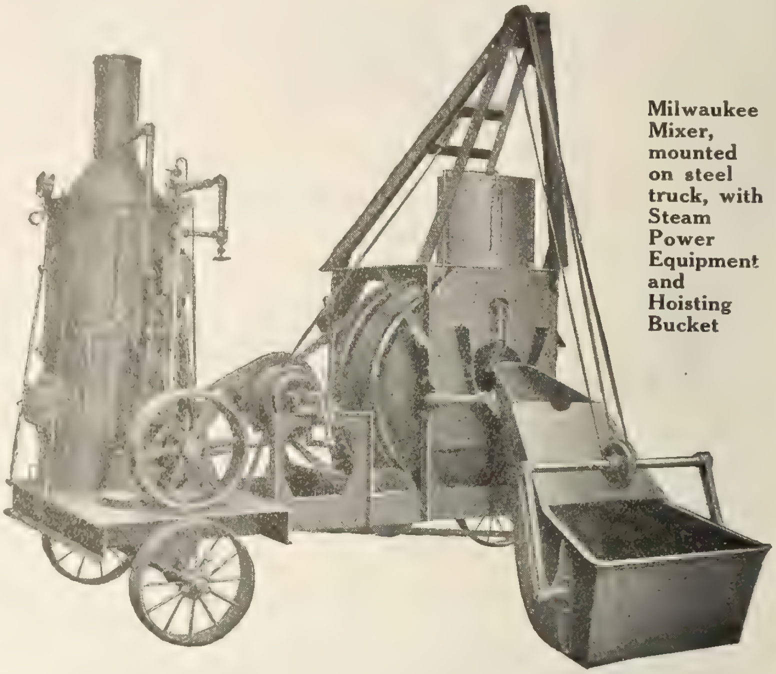
THE HAMILTON MACHINERY CO., LIMITED, HAMILTON, ONT.

Sole Agents for the Above Company

Also Canadian Distributors for the famous Inter-State Automobile.

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

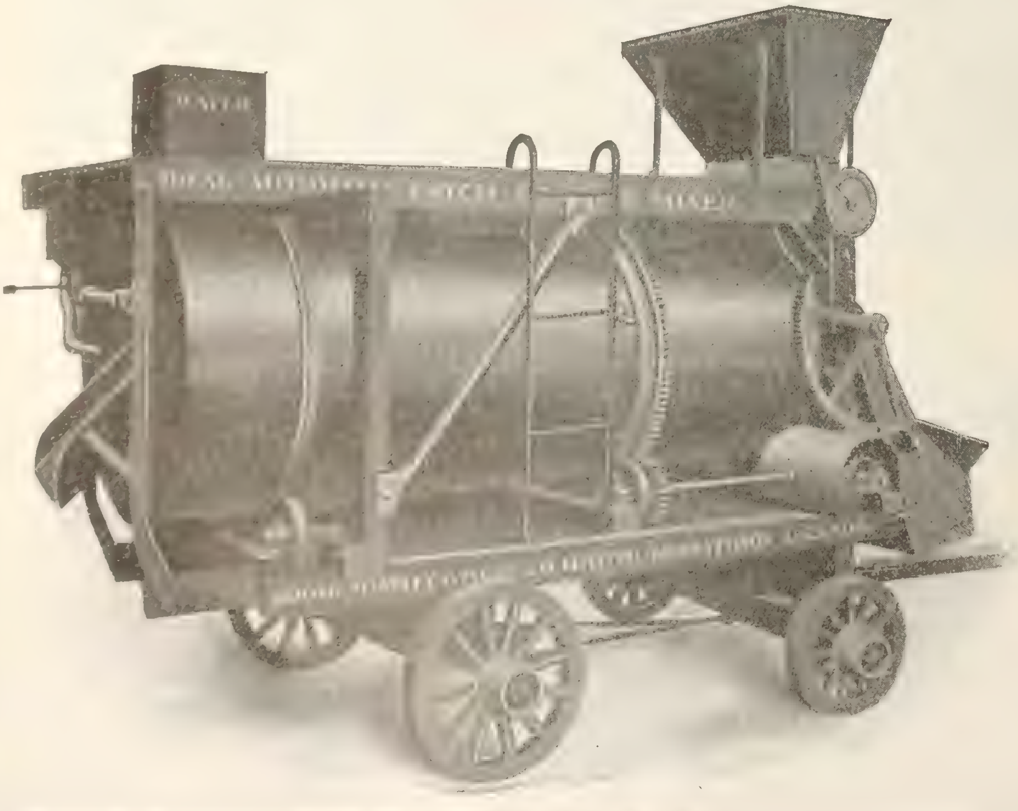
CANADIAN REPRESENTATIVES.

The Stuart Machinery Co., Winnipeg, Man. C. W. Stancliffe & Co., Vancouver, B. C.

H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS



Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The

GOOLD SHAPLEY

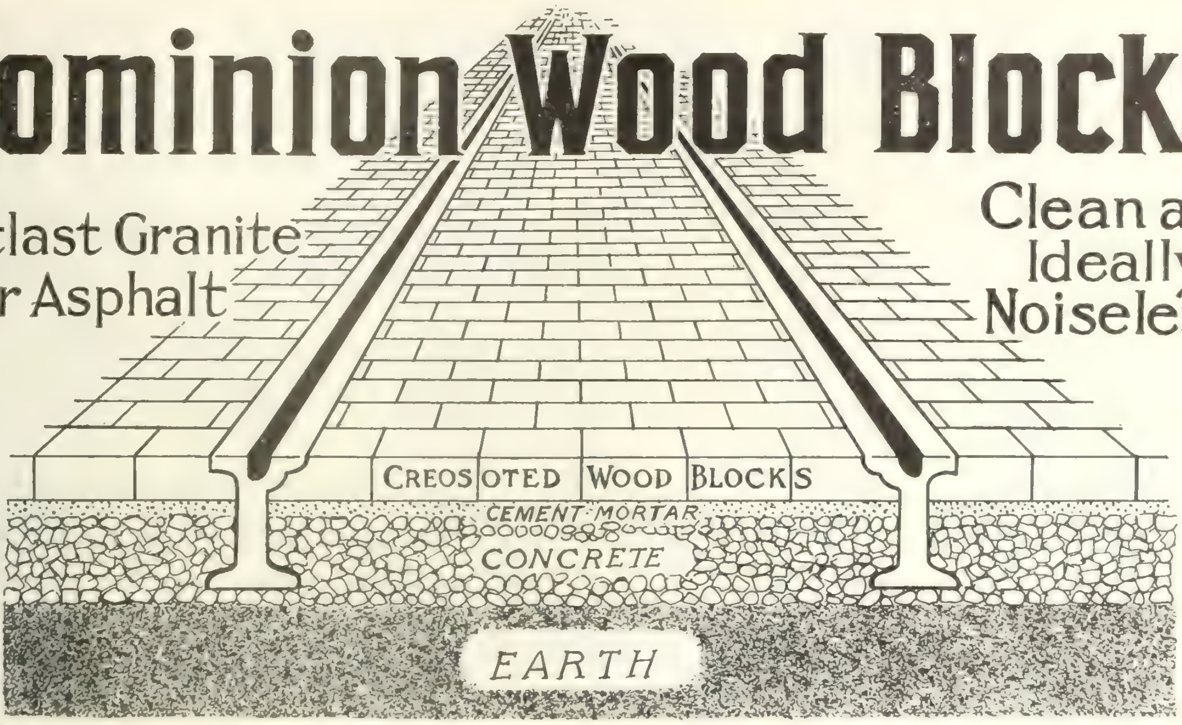
& MUIR CO. LTD.

Brantford, Canada

Dominion Wood Blocks

Outlast Granite
or Asphalt

Clean and
Ideally
Noiseless



Dominion Wood Blocks

make the most durable pavement for all classes of service, from the lightest wear of boulevard vehicles to the grinding of the heaviest trucking traffic. It is the one pavement that won't need the annual attention of the repair gang and will pass out of reserve in perfect condition.

Don't put your money in a pavement that will need patching before the final payment is made on the assessment.

The Dominion Creosoting Co., Ltd.

SUCCESSORS TO

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

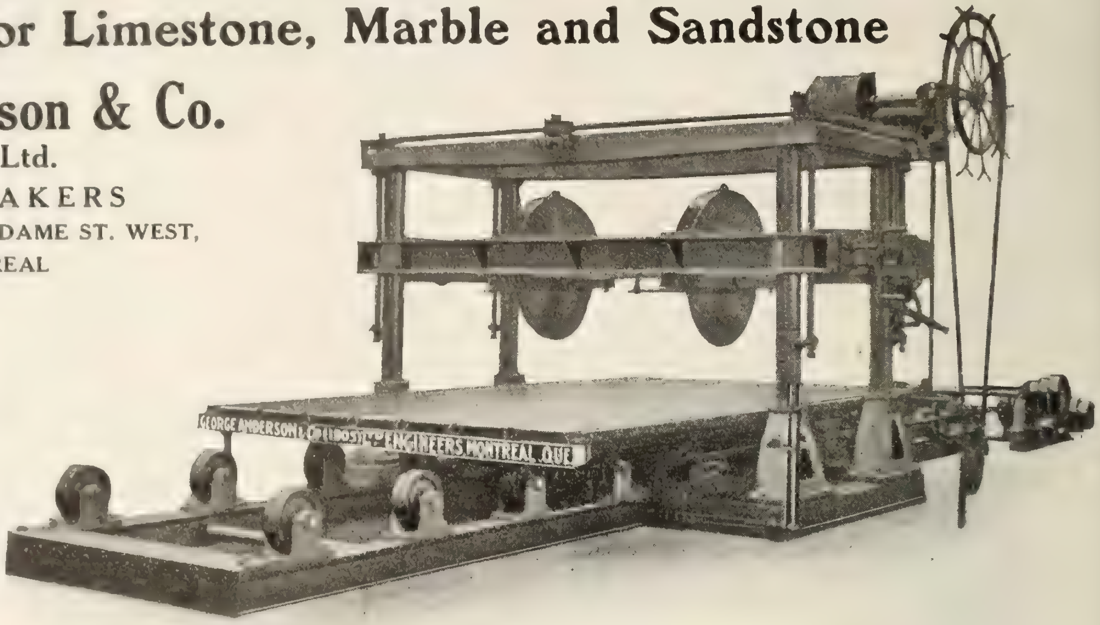
Circular Diamond Saws

For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

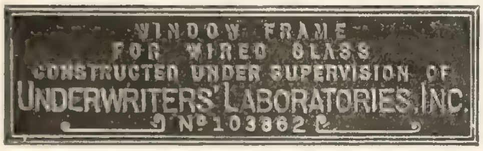
BRANCH OFFICE & WORKS
London, England, 82 Victoria St. S. W., Newark N.J. U.S.A. 420-422 Ogden St., Montreal Works, 157 Craig St. West, Head Works, Carnoustie, Scotland

MAKERS OF
CANGS PLANERS, MARBLE DRESSERS DERRICKS, AND ELECTRIC TRAVELING CRANES UP TO 50 TONS, QUARRY MACHINERY, GAS ENGINES AND PRODUCER PLANTS 10 H.P. TO 150 H.P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 **SINGLE AND DOUBLE TABLES**

About 50 of the above Machines at work in Canada


WINDOW FRAME
FOR WIRED GLASS
CONSTRUCTED UNDER SUPERVISION OF
UNDERWRITERS' LABORATORIES, INC.
Nº 103862

Underwriters' Label.

The Underwriter's Test

There is absolutely no question as to the comparative value of our Metal Fireproof Windows over the old-fashioned metal or metal-covered wood shutters. Repeated tests have proved conclusively the superiority of metal fireproof windows.

The ideal fireproof windows should be constructed to meet the following requirements:

It must be absolutely fireproof.

It must have hollow sheet metal frames and sash, fitted with wire glass.

It must be riveted and locked together so that it will not fall apart when exposed to intense heat, solder only being used to finish the seams and mitres.

The Douglas Window has stood the National Board of Fire Underwriters' test to which it has been subjected at their Laboratory at Chicago, and is endorsed by them.

DB **DOUGLAS BROS LIMITED** DB
TORONTO, ONT. MONTREAL, P.Q.

DO YOU USE

"R. I. W." No. 232?

(TOCH BROTHERS)

IT INSULATES AND RENDERS DAMP-PROOF ALL BRICK WALLS
HOLDS PLASTER TO BRICKWORK

SAVES COST OF FURRING AND LATHING **PREVENTS STAINING ON INTERIOR PLASTER**

USED SUCCESSFULLY ON

NEW PUBLIC LIBRARY PENNSYLVANIA TERMINAL SINGER BUILDING
METROPOLITAN LIFE BLDG. MT. SINAI HOSPITAL NEW U.S. CUSTOM HOUSE
ALL IN NEW YORK CITY

SEND FOR CIRCULARS AND INFORMATION

CANADIAN OFFICE AND FACTORY

THE R. I. W. DAMP RESISTING PAINT CO.

1372-1376 BATHURST STREET - TORONTO

CANADIAN DISTRIBUTERS:

CHILLAS BLACK, LIMITED
TORONTO

E. F. DARTNELL
MONTREAL

WM. N. O'NEIL & CO.
VANCOUVER

The Steel Company of Canada
Limited
Hamilton - Toronto - Montreal
Plain Rounds, & Squares, Cold Twisted Squares
Maxwell Deformed Bar
STEEL BARS
for Reinforcing Concrete

J. H. NEW, President RYLAND H. NEW, Vice-Pres.

Hamilton Vitrified Salt Glazed Sewer Pipe

Known as the best for 50 years
The Quick Shippers

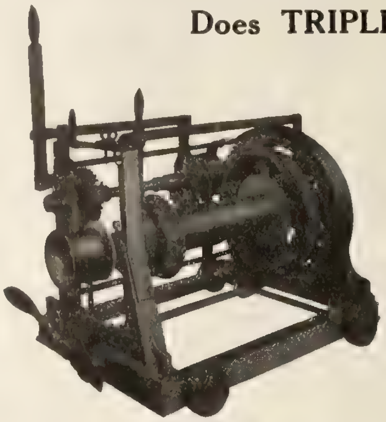
The HAMILTON & TORONTO SEWER PIPE CO., LIMITED

HAMILTON and TORONTO

LONG DISTANCE PHONES: Toronto, Main 990, College, 1558
Hamilton, 3990, 3991, 3432

The Parker Reversible Friction Hoist

Does TRIPLE Duty



Run with Gasoline Engine or Motor

No Experienced Operator Required

Drum. Elevator Sheave, Winch-head all operate independently of each other, and are each reversible. This hoist operates a derrick from the drum, a double cage material elevator from the sheave, and serves various other purposes from the winch-head—all on one job.

PAYS FOR ITSELF ON ONE ORDINARY JOB.

"I have used your No. 100 Reversible Hoist for over 5 years. It runs like a clock and has cost me nothing for repairs."
From an Experienced Contractor.

We also build derricks, steam and electric hoists in all sizes. Sole manufacturers of the PARKER PATENTED DERRICKS.

Write for information and prices.

S. E. PARKER, 1800-2 N. Francisco Ave., Chicago, Ill.

Selling Agents:
Gorman. Clancey & Grindley, Calgary and Edmonton, Alta.
J. L. Stuart Machinery Co., Winnipeg, Man.
A. G. Langley & Co., Vancouver, B.C.

Canadian Bucyrus Steam Shovels

Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

The

Standard Drain Pipe Co.

Limited

TWO FACTORIES:

St. Johns, P. Q. and New Glasgow, N. S.

MANUFACTURERS OF

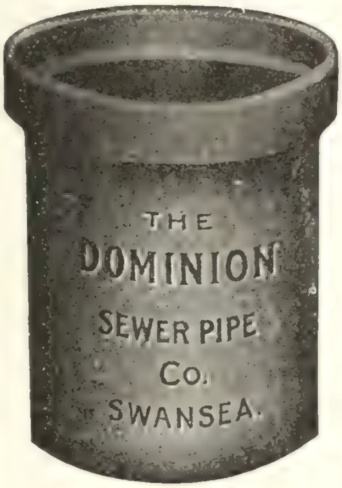
Sewer Pipes, Culvert Pipes, Chimney Linings, Hollow Building Blocks, Fire Clay, Stove and Range Bricks and all kinds of Fire Clay and Vitrified Goods.

Catalogue and prices on application

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

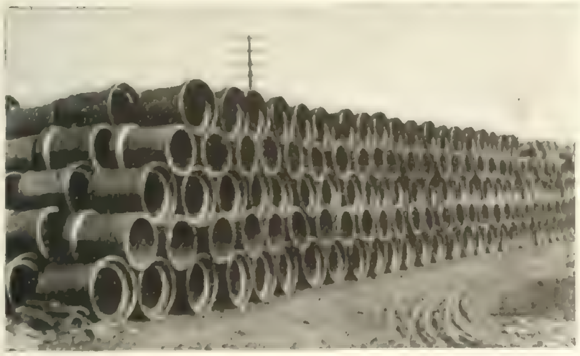
The Dominion Sewer Pipe Co.

(The Independent Co.) **Limited**

SWANSEA (near Toronto)

The Pipe of the Hour — Mimico Brand

MIMICO PIPE IS RIGHT



ROUND PIPE and SQUARE DEALINGS

It is not Gas Pipe nor Steam Pipe, it is

SEWER PIPE

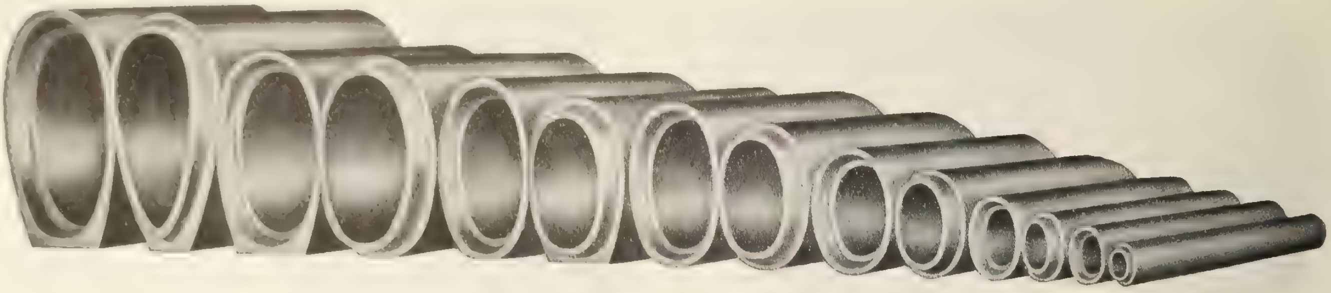
MEN who know have
Intimated to us
Many times that
It pays to buy "Mimico." The
Cost is little or no more than
Other makes.

Perhaps you are
Interested in
Proposed contracts. Ask the
Engineers about it.

The ONTARIO SEWER PIPE COMPANY, Limited

MIMICO, ONTARIO

Telephones, Toronto Connection, Park 422; Evenings, Park 3888 and 3889



We Guarantee Our

Reinforced Concrete Pipe

for Culverts and Sewers

"Long Service at Low Cost"

Our **Pipe** is **frost-proof, indestructible** and **everlasting.** It is easily handled, easily placed, and easily procured. It has been approved by **most particular, most renowned, most experienced,** and **most skilled engineers.**

Stock sizes 6 inch to 48 inch. Other sizes to order. **Write for catalogue and prices.**

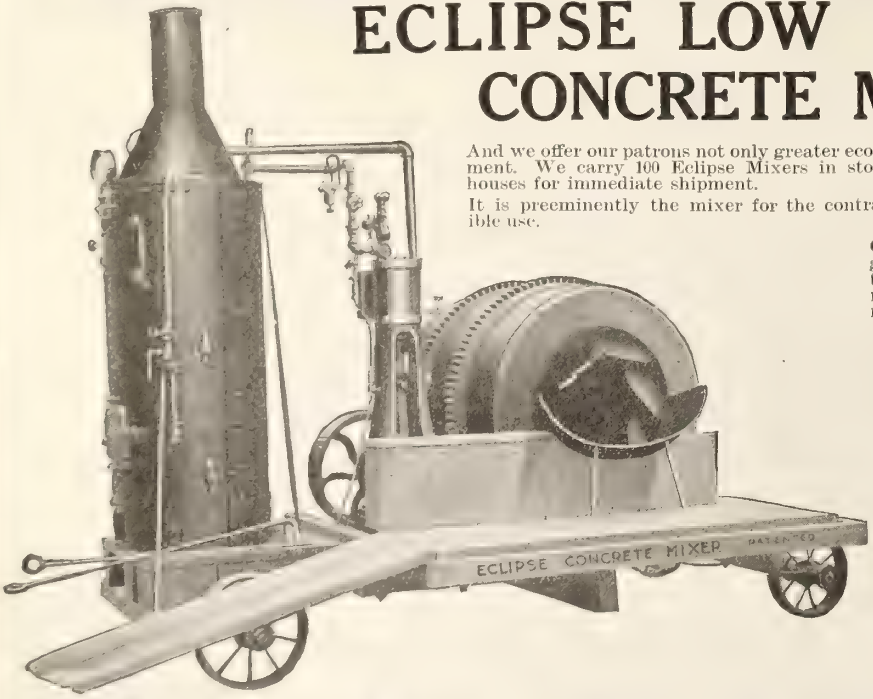
Dominion Concrete Company, Limited

KEMPTVILLE - ONTARIO

You Can Pay for the Mixer on a Single Job by the Greater Economy of Operation

It is not alone the saving of 1-3 in first cost, 1-2 in power, one man to operate the hoist and 2-3 the delays and repairs, but the greater portability enabling it to always be kept at the most convenient position on the job for rapid work that are the distinguishing features of the

ECLIPSE LOW CHARGING CONCRETE MIXERS



And we offer our patrons not only greater economy of operation but unequalled service in shipment. We carry 100 Eclipse Mixers in stock at our factory, stores, warehouses and branch houses for immediate shipment.

It is preeminently the mixer for the contractor because it saves money in nearly every possible use.

Our new 1911 catalog No. 45 is just off the press and gives full information how to handle the Eclipse to obtain best results. Write for it. Our testimonial booklet explains how other contractors are making money by using the Eclipse Mixer.

You Can Buy the Small Size Eclipse Batch Mixer Complete with Power at a Lower Price than a Continuous Mixer.

MANUFACTURED BY

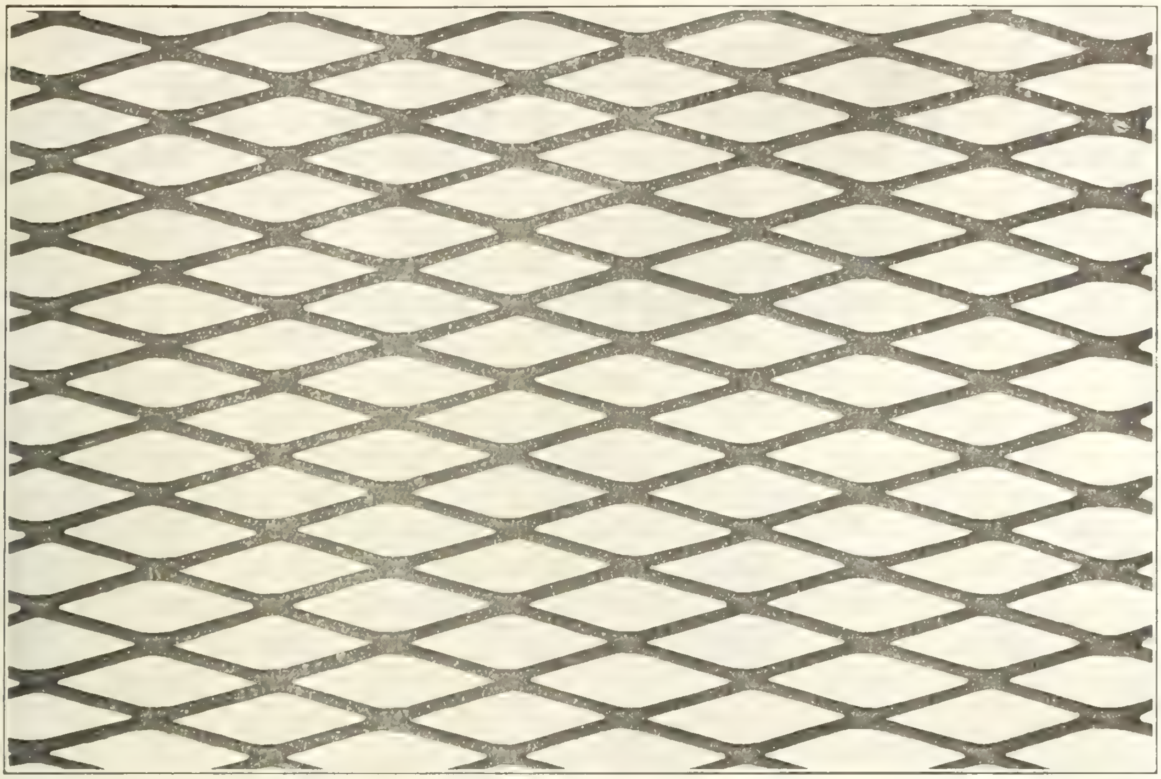
The Standard Scale & Supply Company

CHICAGO
1345-1347 Wabash Avenue

PITTSBURGH
243-245 Water Street

PHILADELPHIA
35 South Fourth Street

NEW YORK
136 West Broadway



"Steelcrete" Diamond Mesh the Lath with a Reputation

Since Expanded Metal was first made in Canada "Steelcrete" has been the acknowledged standard from Coast to Coast.

To-day, there are more yards of it in actual use, probably, than all other Canadian Laths combined —a few "Steelcrete" jobs being the King Edward Hotel, Toronto, the Royal Mint, Ottawa, Ontario Parliament Buildings, Toronto, Winnipeg Post Office, new East and West Blocks Dominion Parliament Buildings, Ottawa.

"Steelcrete" Expanded Metal Lath

weighs 3½ lbs. per square yard—half as much again as is claimed for laths of same gauge.

acquiring rigidity by shape and weight of strand has no raised ribs or beads to bury—hence makes plastering easier, quicker and cheaper.

—being made in sheets 30" wide wastes only half as much in laps and costs only half as much to apply as other laths.

-is made by same process and with same care and precisionas heavy expanded metal therefore is perfectly flat and straight.

Samples, Prices and Lath Catalogue on Request.

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE FRASER AVENUE

MONTREAL
138 CRAIG STREET WEST

St. John 13 Germain St.
Quebec 153 St. Paul St.
Ottawa 83 Banks St.
Regina Black Block

Fort William 113 N. May St.
Winnipeg 334 Garry St.
Calgary 309 8th Avenue.
Vancouver 116 Pacific Bldg

The Roof That Never Wears Out

You'll have no "Come Backs" from your clients if you specify "Asbestos Shingles"

There is no roof equal to Asbestos Cement Slate. It positively ensures immunity from fire, water, and the effects of time and erosion.

Asbestos Shingles

Are manufactured on thoroughly scientific principles. They do not crack, rent, or scale, and they are impervious to heat or moisture.

ALWAYS SPECIFY

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P. Q.
Factory at Lachine, P. Q.

TENTS

for Engineers and Contractors

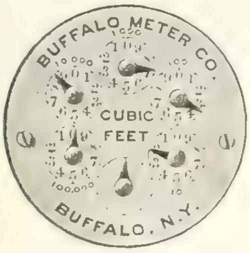
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

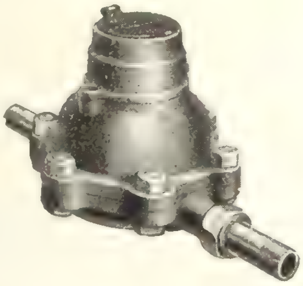
Woods Limited
Woods Building - Ottawa, Ont.

AMERICAN AND NEW NIAGARA
WATER METERS



Standard Dial

Straight Reading Dial



Jewel Bearing
Intermediate Gears
Self Cleaning and Sanitary
Adjustment for Pressure
Extra Thick, Strong Disc
Accuracy Guaranteed
Fewest Parts

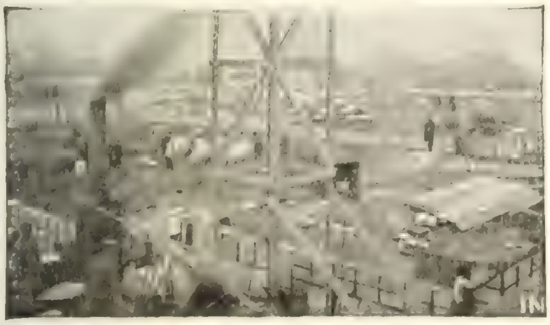
BUFFALO METER CO.
290 TERRACE, BUFFALO, N.Y.

The United States Steel Corporation, at Gary, Ind.;
Stone & Webster Engineering Corporation, Minneapolis, Minn.;
A. Monsted Co., Milwaukee, Wis.;
Geo. B. Swift Co., 903 Security Bldg., Chicago.;
Pacific Coast Condensed Milk Co., Seattle, Wash.;
Sheffield Farms-Slawson Decker Co. Amenia, N.Y.; and
Inland Steel Co., Indiana, Ind.,
are among the largest users of concrete in the United States. They and many others, are using

REICHERT METAL FORMS

And saving from 3 to 7 cents per square foot.

Why do YOU stick to the old methods and let this additional profit slip away from you?



Building a big factory building with Reichert Metal Forms—Pacific Coast Condensed Milk Company's plant at Berlin, Wis.—Stone & Webster Engineering Corporation, builders.

REICHERT MFG. CO.
MILWAUKEE, WISC., U.S.A.

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street
New York City

Corinthian Stone

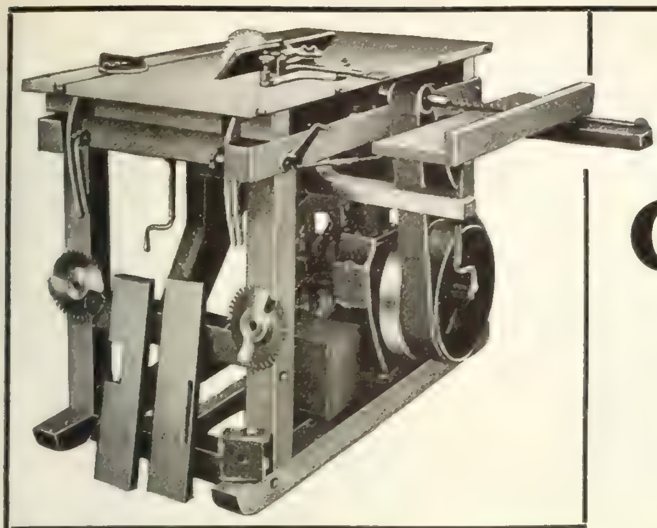
is extensively used for Churches, Schools and Colleges. In trimmings for brick or stone work, it is without an equal. Special prices for any work where a large quantity of repetition occurs.

St. Jerome College, Berlin, Ontario.

A large quantity of Corinthian Stone was used in building this well-known College. Estimates given for all classes of work. Send plans or write to :: :: :: : ::

The Corinthian Stone Co.

OFFICE AND WORKS:
G. T. R. JUNCTION, GUELPH, ONTARIO



On Every Concrete Job

You can save 10 to 15 per cent by using our Contractor's Portable Saw and Variety Woodworker.

Now is the time when you are starting to do your concrete work and this saw will be just what you are looking for—a cheap practical saw that will prove itself a time saver and money maker for you.

CONTRACTORS SUPPLIES OF ALL KINDS

The
Canadian Fairbanks Co., Limited

Fairbanks-Morse Gas Engines, Fairbanks Scales. Safes and Vaults.

Montreal Winnipeg Toronto Vancouver
St. John, N.B. Calgary Saskatoon Ottawa

WHAT IT IS

A Rip Saw
A Matcher
A Mitre Saw
A Cut-Off Saw
A Dado Machine
A Jointer
A Boring Machine
A Gaining Machine
A Grooving Machine
A Babbitting Machine
A Moulder with Self-Contained Power

THE MILTON PRESSED BRICK CO. LIMITED

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance—it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

We are Agents for the Fiske Tapestry Brick, suitable for high-class residential work. At our Toronto Office we have set up panels of the different color schemes and would be pleased to have you call and examine them.

Head Office: Milton, Ont. Toronto Office: Janes Building

EADIE-DOUGLAS LIMITED, Ottawa Agents

Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

RU–BER–OID ROOFING

Trade Mark Registered

is Proof Against Extreme Heat

An examination of a variety of roofs on a blazing summer day will demonstrate one of the chief reasons why **RU**-BER-OID gives longer service per dollar of cost than does any other roofing.

Look at the tar roof—half melted, running, perhaps dripping through between the roof boards. Notice how the lighter oils are making their way to the surface and evaporating, leaving little pits with tiny channels running down into the fabric.

Look at the ready roofing which is saturated with tar or some asphalt compound. Practically the same thing is happening. The volatile oils are frying out and evaporating, leaving the fabric hard and full of little holes. The water and dirt work into these holes and rot the roofing in short order.

RU-BER-OID is the one ready roofing which is really proof against the hottest summer sun. It contains no tar and no volatile oil, as is shown by its lack of odor. The **RU**-BER-OID gum, with which the wool-felt fabric is saturated, has a melting point far higher than the temperature reached on the hottest day, and there is nothing in it that will evaporate or dry out.

That is why you never find **RU**-BER-OID Roofing covered with little oily spots, nor blistered, nor soft and mushy in the heat, nor hardened or cracked.

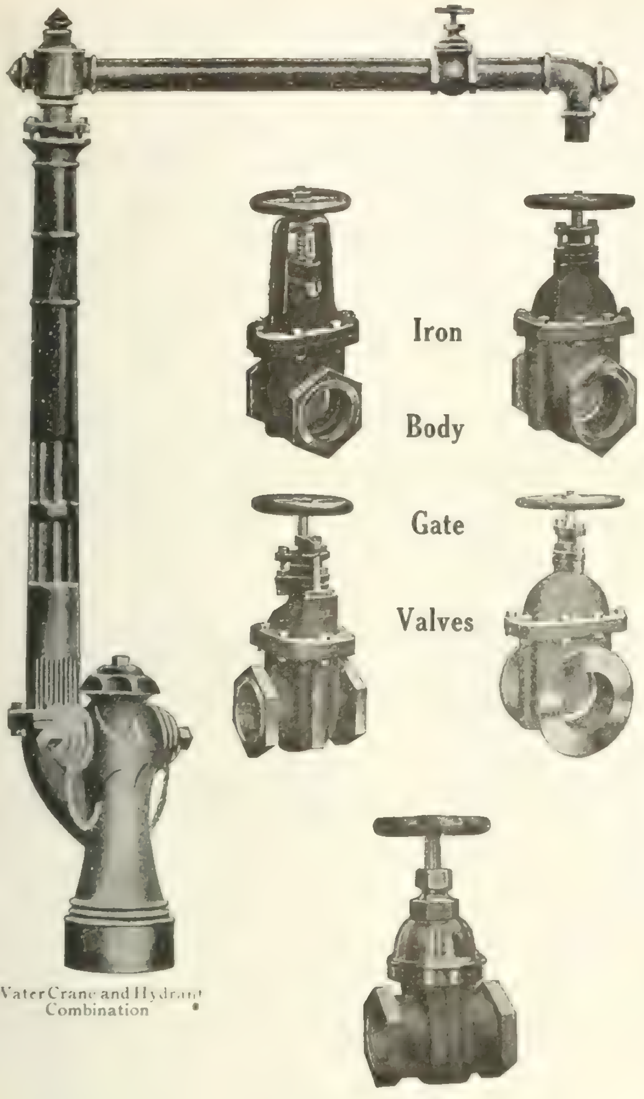
Twenty years of service, from the Tropics to the Polar Circle, have proved that **RU**-BER-OID retains its pliability, its strength and its waterproof qualities, under any and all conditions of temperature, for a longer time than any other ready roofing has stood the test.

When you cover a building with **RU**-BER-OID you can feel sure that your work will not be discredited by any weakness in the roofing.

The Standard Paint Co. of Canada, Limited

286 St. James St., Montreal
105 Tenth Ave. E. Calgary

179 Bannatyne Ave. E., Winnipeg
25 Pender Street W., Vancouver



Water Crane and Hydrant Combination

"Weber" Gate (Brass)

Indicator Post for Fire Protection Valve

We Make
KERR
Valves
and
Hydrants

for every branch of waterworks construction

Every part of every "Kerr" valve is accurately made and finished, making them reliable under all conditions

A system of waterworks is not a proposition that a city or town has to undertake very often and it is a big saving to have the first installation done properly by specifying the best of materials. "Kerr" goods have a reputation for being reliable and lasting.

Shall we send you a catalogue?

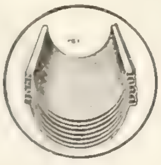
THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

PEDLAR NESTABLE CORRUGATED GALVANIZED CULVERT

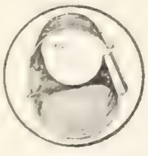
Is the Strongest, Most Practical, Durable and Easiest Laid Culvert Made

YOU ought to show this advertisement to your township reeve or warden. Get him to write for the free book about Pedlar Culverts, or write for it yourself and tell him about this new Culvert—the quickest, most economical, strongest for any use any culvert can serve.

THESE culverts of mine are a great thing for the farming world. They not only make good roads possible, but they serve the farmer in many other ways. And they are so simply laid. They come nested like this.



This compactness saves freight and makes it easy to handle them. You put the sections together like this:



Then you clamp the flanges together like this:

And you've got a piping that will outlast anything of the kind there is. Better get the book and sample and study it.

G. H. Pedlar

See How It Saves Farmers' Money, Betters Roads, Lowers Taxes

This picture is from a photo of a wash-out fourteen feet deep in the Township of Darlington, caused by use of cement tile for drainage purposes. The township authorities have replaced that with Pedlar Perfect Culvert, forty feet in length by three feet in diameter; strongest, easiest laid and most durable they could get.

This picture of the Pedlar Perfect Culvert assembled and ready to lower into place, shows the immense strength and rigidity of these Culverts. Though forty feet long with a bearing of only a few feet at the centre it does not give one-sixteenth of an inch. See how easily Pedlar Culvert can be lowered into place. No skill needed.

Here you see the Pedlar Culvert doing its work of drainage twenty-five minutes after being put in place. It would have taken three times as long and cost three times as much to have installed any other type of culvert. Yet this Pedlar Culvert will last far longer and give no further trouble of any kind.

This view shows the Pedlar Culvert after the fill-in was completed. The Culvert has to carry a dead weight of several hundred tons of earth, as well as the live weight of traffic passing overhead. But that can't strain Pedlar Culvert, which will neither give nor spring. It stands what no other Culvert can.

Write for My FREE Book No. "23" and Sample

and get a correct idea of what makes a good Culvert. Learn how Pedlar Culvert can be used on your farm.

The PEDLAR PEOPLE of Oshawa

411 *Address nearest place*

HALIFAX 16 Prince St.
ST. JOHN, N.B. 42 46 Prince Wm. St.
MONTREAL 321-3 Craig St. W
LONDON 86 King St.
OTTAWA 423 Sussex St.
TORONTO 111-3 Bay St.
CHATHAM 200 King St. W.
QUEBEC 127 Rue de Pond
REGINA 1901 Railway St. S.
WINNIPEG 76 Lombard St.
PORT ARTHUR 45 Cumberland St.
CALGARY 1112 First St. W.
VICTORIA 434 Kingston St.
VANCOUVER 821 Powell St.

Tel. Main 4155

We are now in the Sand Business

Our Wagons hold 2½ Yards

High Grade Sand and Prompt Delivery

Rogers Supply Co.

28 King St. West,

Toronto

KITON is nothing else but TAR

which through a Patented Process is made

Soluble in Water

This solubility however is lost, the moment KITON becomes dry for the first time, that is, after evaporation of the water with which it is mixed. From that instant on, KITON can never be re-dissolved in or washed off by water. It is **impervious** and **weatherproof.**

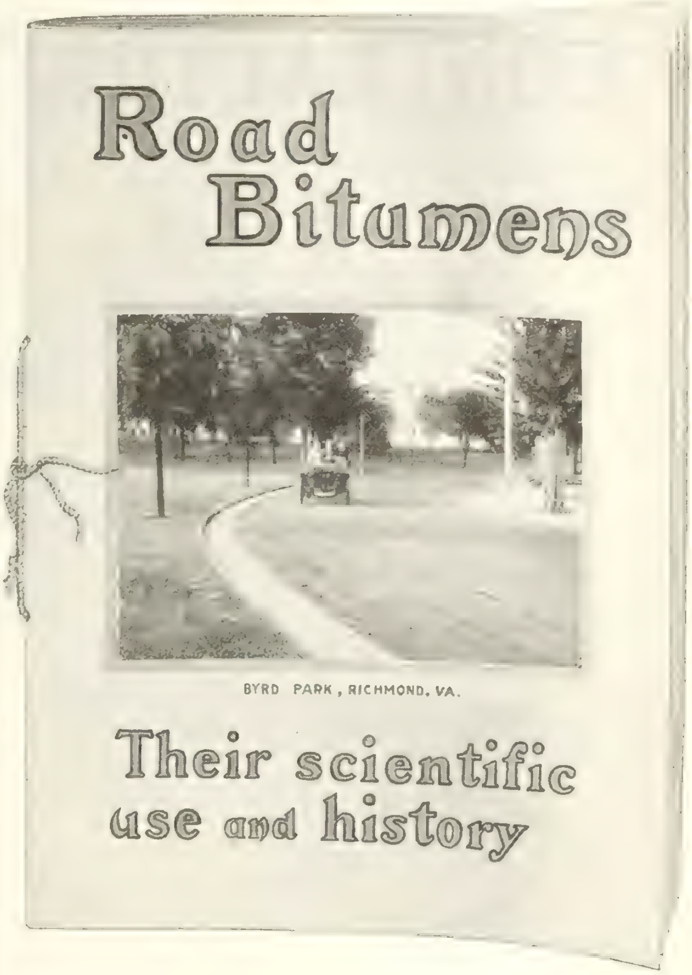
just like tar

BECAUSE it can be applied as easily as ordinary paint,
" it can be coloured if desired,
" it is so economical and yielding,
" it is instantly ready when you want it,

KITON is the cheapest and most reliable surface coating for material subjected to the deteriorating action of weather and atmosphere.

ASK FOR BOOKLET, SAMPLE AND PRICES
ATTRACTIVE PROPOSITION FOR DEALERS

F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.



Road Bitumens

BYRD PARK, RICHMOND, VA.

Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a pamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement Company
First National Bank Building
CINCINNATI

CONTRACTORS LOCOMOTIVES

ONLY ONE QUALITY

Montreal Locomotive Works, Limited, standard contractors locomotives are designed by engineers who have made a life study of the special conditions of contractors service and know what is needed to meet these conditions.

Their large boilers insure free steaming and ability to handle the load for which they are rated. Every piece of material entering into their construction must conform to the same specifications required for 200-ton locomotives. Only the best materials are used.

Contractors locomotives must frequently be operated long distances from repair shops, therefore simplicity and facility for repairs are vitally necessary. This was considered in designing this type of locomotive.

Every part is made in jigs or to gauges, and every part is sure to fit. Stocks are always available at our Works at Longue Pointe, Montreal, Canada.

MONTREAL LOCOMOTIVE WORKS, LIMITED

OTTAWA BANK BUILDINGS, MONTREAL, CANADA

At the Power Plant of The Denver Tramway Co.

are installed

6 **Sturtevant** Metal-to-Metal Joint Economizers. *No Gaskets.* Capacity 300 Lbs. Pressure.

6 **Sturtevant** Multivane Induced Draft Fans direct connected to

6 **Sturtevant** Commutating Motors.

All working in connection with 6 Sterling Boilers 4200 B. H. P.

"Economical Fire Room Methods," by F. R. Low, Editor of Power; Sturtevant Bulletin No. 187-N describes the operation and equipment of one of the most efficient and economical power plants in the world, The Wood Worsted Mills, Lawrence, Mass.; told in a most interesting manner by one of the foremost technical writers in this country. It is yours for the asking.

B. F. Sturtevant Co. HYDE PARK, MASS.

833

Eadie-Douglas, Limited, Montreal **Polson Iron Works, Limited, Toronto**

Why We Can Afford to Sell 500 Troy Dump Boxes at a Special Introductory Price

We want to demonstrate quickly to the largest possible scope of territory the great saving that can be made by the use of TROY Bottom Dump Boxes in connection with regular teaming gears on all dirt moving jobs.

We want to reach the team-owners and contractors who don't know TROY Dump Boxes. Many of them have never seen a TROY and won't believe until they do see.

One TROY Box in a community means an order-getting booster for us. Every sale means more sales and lots of them. That is why we have set aside 500 TROY Boxes for special advertising purposes.

But we must Limit Purchases under this Special Proposition to One Box per Customer

Our regular price for the 1½ yd. Box is $45.00 each and for the 2 yd. Box, $50.00.

We will furnish 500 Boxes at the following special advertising price good only as long as the 500 Boxes last and no order accepted at these figures after September 1st, 1911.

Special Advertising Price, 1 1-2 Cu. Yd. Box............ $36.90 each.
" " " 2 Cu. Yd. Box................ $40.20 each.

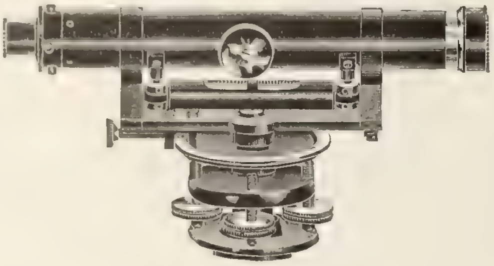
Terms net cash with order, F. O. B. Troy, Ohio. Boxes furnished to fit any size gear.

First come, first served. They won't last long. If you want a TROY Box at these figures, MAIL YOUR ORDER TO-DAY.

THE TROY WAGON WORKS COMPANY

TROY, OHIO

Surveyors' Instruments



We are headquarters for instruments and all supplies and accessories necessary for the equipment of surveyors, architects and engineers. Our Repair Department is also equipped to do repair work for any make of instruments and assure you accuracy and promptness.

Toronto agents for E. R. Watts & Son, London, Eng.

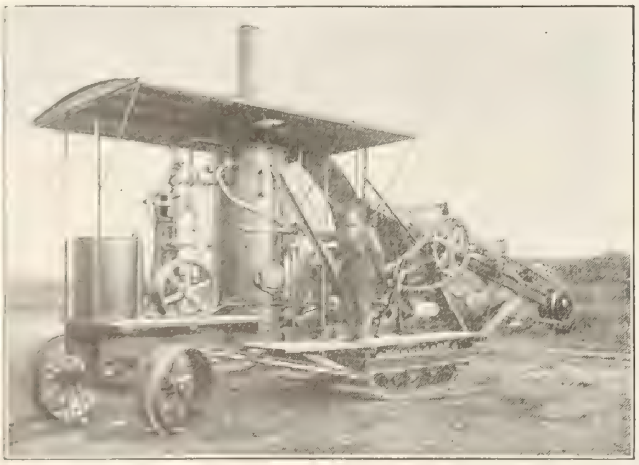
Consolidated Optical Co. Ltd.

Manufacturers of Scientific Instruments

Austin Trenching Machines

Will dig trenches in a straight line or in a circle as small as it is possible to lay ten-inch pipe.

Can be turned in their own length, and will travel backward as well as forward.



Are self propelling and will travel over ordinary roads at the rate of one and a half to three miles an hour. Can be moved from one job to another and be ready to dig at any time, as no parts are taken off or disconnected when moving.

Have self-cleaning buckets with tool steel cutting edges. No matter how sticky the ground may be, it is impossible for them to clog, because every time a bucket discharges an automatic cleaner scoops out the inside so thoroughly that no earth adheres to it.

Note the caterpillar, or multipedant, traction. The wide bearing on the ground enables it to travel over soft, wet ground that would not support a machine of half the weight mounted on ordinary trucks.

Only one man required to operate the entire machine and his only duties are to guide it so that it will follow the line.

They will dig any soil, wet or dry, except solid rock.

Austin No. 1 digs trenches 12 ft. deep, 24 in. to 36 in. wide.
Austin No. 0, 10 ft. deep, 18 to 27 in. wide.
Austin No. 00, 8 ft. deep, 15 to 27 in. wide.
Austin No. 000, 6 ft. deep, 15 to 18 in. wide.
Austin No. 000, 4½ ft. deep, 14 in wide.

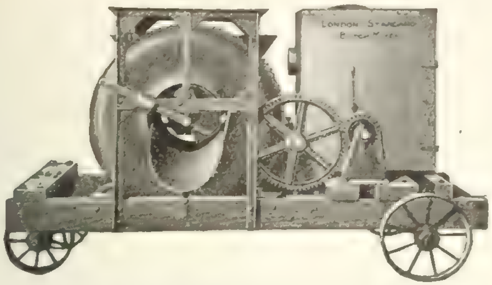
Complete Line Described in Catalogue No. 120-A.

F. C. Austin Drainage Elevator Company

Railway Exchange, CHICAGO, ILL.

Agents Wanted in Unoccupied Territory.

Canadian Equipment & Supply Co , Calgary and Vancouver—Agents for Western Canada.



London Standard Drum Batch Mixer No. 1
Equipped with Gasoline Engine

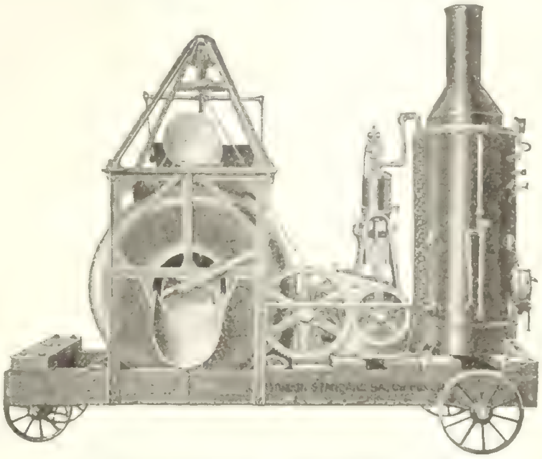
London Standard Batch Mixers

THE LONDON STANDARD DRUM BATCH MIXERS are made in four sizes, namely, one-third yard, one-half yard and one yard batches and are furnished with any equipment.

THE MANY NEW AND IMPROVED FEATURES of the London Standard Drum Batch Mixers appeal to every contractor desiring a mixer of this type. WE CAN GIVE YOU THE BEST VALUE FOR YOUR MONEY of any Firm doing business, BECAUSE we manufacture only Concrete Machinery, and on this account we can sell you a machine at very much less cost than Firms who do not manufacture their own machines but handle a concrete mixer along with other lines of goods.

We also Manufacture—
FACE-DOWN BLOCK MACHINES
CEMENT BRICK MACHINES
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES
SEWER PIPE MOLDS
ORNAMENTAL MOLDS SILO CURBS
ADJUSTABLE SILL, STEP AND WINDOW
CAP MOLDS FRICTION HOISTS
And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.



London Standard Drum Batch Mixer No. 2 equipped with Steam Engine and Loading Skip

London Concrete Machinery Co.

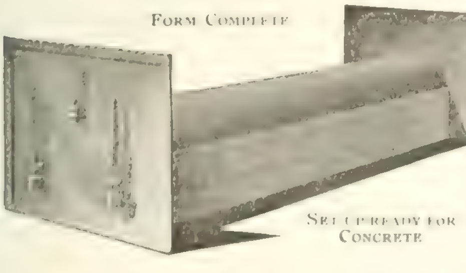
Limited
19 Marmora St., LONDON, CANADA

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
Hamilton Machinery Co., 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.
Foss & Hill Machinery Co., 329 St. James St., Montreal.

COLLAPSIBLE STEEL FORMS

For the Building of

Culverts, Conduits, Small Bridges, Sewers, Etc.



Our Collapsible Steel Forms are the lightest, strongest and most durable made. They combine in the simplest way every requirement for rapid and practical work, and are attracting wide attention. They are highly endorsed by road and street officials, contractors and engineers everywhere.

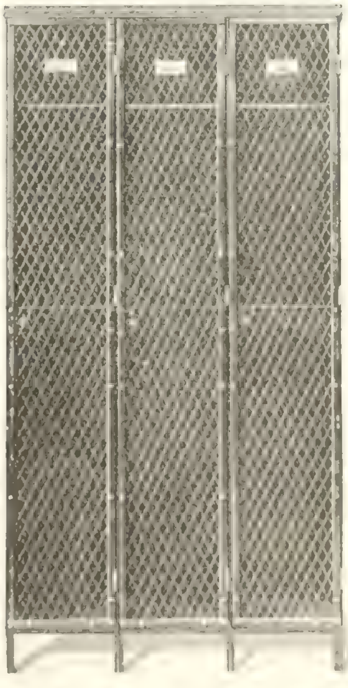
Write for Form Catalogue
Engine Catalogue for the Asking
Commissioner's Time Book Free

Concrete Form & Engine Co.

Successor to Collapsible Steel Form Co.

83 Congress St. W., Detroit, Mich.

'Meadows' Metal Lockers



Make friends because of their substantial construction and unique features. We make several styles and sizes of these lockers. We'll know what you want if you just hint at your requirements.

Send for our interesting booklet entitled
"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA

Concrete Mixers

SPECIAL REPRSENTATIVE
C. L. TRIMINGHAM
Canada Life Bldg.
WINNIPEG

We want to send you a booklet giving a brief and interesting history of our Mixer. Before you make any further purchases it will pay you to read our literature which is based on actual results. Let us know your wants for we believe we can interest you in our Concrete Mixer.

485 St. James St.,
MONTREAL

485 St. James St.,
MONTREAL

CANADA FORD COMPANY

THE STANDARD IDEAL
COMPANY LIMITED
GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

Plate F. 465

THE STANDARD IDEAL WASH SINKS are the most perfect, durable and satisfactory for the plumber to install because they are thoroughly adjusted and fitted before leaving our works.

Their quality is unsurpassed and a permanent advertisement for the plumber who installs them.

Roughing Measurements sent on request.

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 August 2, 1911 No. 31

Railway Tactics

The Grand Trunk Pacific Railway Company has occasioned much adverse criticism along the Pacific coast, according to the Western Lumberman, owing to the fact that recently an order for some 8,000,000 feet of lumber for construction work in the west went to Seattle firms, despite the fact that large British Columbia mills capable of handling the contract were waging stiff competition among themselves, and quoted very low figures in an effort to get the order. Attention was also drawn to the fact that a Seattle firm has been awarded the contract for the company's $300,000 wharf in Vancouver, and that all repairs to the company's steamers are made at Seattle shipyards. A report is now issued that a further order of 5,000,000 feet is on the point of being placed with Washington firms.

From a consideration of the above facts it would appear that the lumbermen of British Columbia have just cause for their complaint. The quality of Canadian lumber compared to that which the Seattle firms were prepared to provide is perhaps a point strong enough to turn a decision of this kind. It would not appear likely that the Grand Trunk Pacific Railway Company would ignore the British Columbia mills on the contention that they are unable to supply such a large order. It is altogether probable that the tenders from all firms were considered alike, and that the successful tenderer drew up the closer bargain, and that the saving of dollars and cents was in this case a decided factor. It does not seem likely that, all things being equal, the Grand Trunk Pacific would cross the line for their supplies. The company would be much more likely to patronize the Canadian mills, were the prices in any way nearly equal.

The editorial goes on to contrast the action of the Canadian Pacific Railway Company in purchasing a million and a half feet of choice lumber from a Canadian firm at a price considerably in excess of the quotation from Washington firms, and quotes Vice-president Whyte as follows: "It is the policy of the Canadian Pacific Railway, as it has always been, to patronize and support Canadian industries, and not to shave the profit of these industries too close, as it is by their development and success that the permanent and dependable traffic of the Canadian road is built up."

Considering that the Grand Trunk Pacific Railway's bonds are guaranteed by the people of Canada, who will be taxed to pay part of the cost, the whole of the operating expenses, and the sum of the interest demanded by the bond holders, it is only natural that they should be interested in whether the company spends its money with an inclination towards the up-building of the country's interests.

Quantity Surveyors

There are numerous instances where extensions of time to tenderers for preparing their bids are impossible, and where a reasonable length of time between the call for tenders and its closing, recommended editorially in a previous issue of the Contract Record (July 5), is not available. It is in a case of this type that quantity surveying would prove invaluable to contractors and manufacturers, and to the engineers as well. It is most needed here, and when once begun, general adoption will eventually follow.

Quantity surveying is a business in itself in northern England, and is being largely adopted in the London district. Some architects and engineers in England do their own quantity surveying and make it a success. As a rule, however, their practice extends only to the limits of their own work, which may not be extensive enough to warrant large outlay of time and office force for compiling complete price lists of materials to cover all branches of the work satisfactorily. The more desirable and reliable method is that of the engineer who makes quantity surveying his entire business. He is called upon, during the preparation of the specification, to figure out the cost to the contractor of the material in the quantities required. He tabulates his results in a column opposite each item. The result is a specification that specifies concisely and explicitly. A brief perusal of it is sufficient to satisfy the contractor or manufacturer as to whether the work is suitable to his capacity regarding equipment, materials, and labor, to render it a profitable enterprise for him. He can align his capabilities to suit the requirement, and decide directly without the usual loss of time.

Another beneficial result is that one set of calculations suffices for all the tenders. The quantity surveyor receives his pay in the form of a commission on the amount of the accepted tender, the percentage being in the neighborhood of 2 or 3 per cent. If a dozen firms tender for the work each receives an equal benefit from his services and each pays one-twelfth of the amount that would have been incurred by the twelve companies, each taxing its estimating office (if it possessed one) with the same work.

The constant haggling over extras is also eliminated. The contractor's price generally exceeds largely the engineer's valuation of any work that has been done additional to that mentioned in the specifications. Here the quantity surveyor's figures could be resorted to with ease. For instance, if the owner decides that an additional ten feet of brick wall would improve his property sufficiently to warrant his building it, the contractor feels safe in going ahead with it when properly requested. He knows that the brick item in the quantity survey is behind him, and that it forms the basis for his extra remuneration, which will be pro rata.

A conscientious quantity surveyor could soon work up a good business and, keeping his data strictly up-to-date, should be able to take care of a large list of specifications, as the work relative to each would be largely clerical. Architects and owners in Toronto could well keep a dozen such offices busy, and the field throughout Canada is significant.

That a material profit would be derived by manufacturers and contractors is obvious and the result would likewise be a considerable benefit to the architects and owners as well. Specifications would tend to become explicit as to requirement of quantities, and conditions for their installation.

Inspection of Street Work

The Bureau of Public Efficiency of Chicago is passing considerable criticism upon asphalt pavement work in that city. The fault-finding, according to the Engineering Record, is mainly directed against inspection and workmanship, particularly in the matter of temperature regulation.

Anybody acquainted with the trouble which a contractor has in getting his materials on the job in good condition, when the haul is long from the plant to the street, and in getting them laid properly with only partly trained men, will sympathize with him. When a large amount of asphalt paving is being laid it is very hard to get experienced, resourceful and energetic foremen and good workmen, even at wages considerably higher than are paid for similar work under ordinary conditions. But these circumstances have nothing to do with the fact that the contractor has agreed to lay a pavement of prescribed character, and that the inspectors are on the job to see it is done. The best of specifications are of trifling value if their requirements are ignored, and just as much attention should be paid to organizing, training and supervising the inspectors as to studying the details of the specifications. Until this is done, so that the city may be certain it gets what it contracts for, it is well to think very seriously over one of the bureau's most important recommendations. This is to cut down the depth of the pavements laid on streets not subject to heavy travel from 9½ to 7 inches. It is suggested that 4 inches instead of 6 inches of concrete might be used, 1½ inches of close binder as at present, and 1½ inches instead of 2 inches of wearing surface. Had such construction been used on the 500,000 square yards of asphalt pavement laid in 1910 on residential streets, the bureau estimates that a saving of over $200,000 would have been effected. Theoretically this may be correct, but as the thin pavements require, even more than those now laid, the best kind of material and workmanship, it would be wise to improve the inspection of street work before reducing their factor of safety so much as is suggested. The proposal is plainly a good one; the difficulty is to ensure its execution properly.

Storage of Cement

It is not generally recognized how quickly the finely-ground cements of to-day are depreciated by storage of the ordinary kind on works. Cement is usually received on a job packed in sacks, and is very often obtained in large consignments, and has to be stored on the works. Sheds are provided, generally of flimsy construction, which offer plenty of opportunity for the passage of air through them, being built, for instance, of boards, the joints of which are fairly open. The moist air that passes through the storage sheds gets taken up rapidly by the finely-ground cement, which cakes, and one finds after a short while the outside portions of the sacks to be quite hard. This is often aggravated on works near any water-logged soil, or in connection with bridges, the covering over of a stream with a culvert and such-like, by the erection of a shed with boards nailed to upright posts just stuck in the ground and without any proper floor, the cement being merely stacked on open boards laid direct on the ground. In some cases the cement has been stored for the winter in such situations. Of course, there is every opportunity of moist air being in association with the cement, which naturally depreciates with great rapidity, and in a week or two loses half or more of its strength.

The old clause which was inserted in specifications in the past, requiring the cement to be stored in thin layers and turned over from time to time, was distinctly advantageous with the coarsely-ground cement which was the custom in the earlier period of manufacture, and which frequently contained free lime, but the cement of to-day is entirely different, and it requires a different treatment. The finer ground a cement is, of course, the better it is, and therefore we see the foolishness of storing the modern cement for some time before usage. If, as often must be the case, the cement is to be taken in large consignments, then it should be stored in air-tight bins— that is to say, compartments into which moist air is not permitted to pass; but in most cases it is possible to arrange the consignment so that the cement is used while fresh, very shortly after it is received from the manufacturer. The product sent out by the manufacturer is good enough for use straight away.

We require the cement to give us a strong concrete—that is to say, strong in compression—and, as we have said, the storage for a few weeks can only result in reducing the strength of the concrete to perhaps a half, and that means that we are losing 50 per cent. of value. The importance, therefore, of speedy usage or proper air-tight storage of cement is obvious. —(Concrete & Constructional Engineering).

Proposed amendments to the building by-law of Calgary, shortly to be submitted to the council for ratification, provide for the extension of the business area or fire limits of the city in order to insure a better standard of construction in general. The proposed changes, if adopted, will make it necessary for owners of buildings over six storeys to erect their buildings of fireproof construction, and to fireproof five and six story buildings on the first and second floor, according to each respective height. In all other buildings, mill or slow burning construction will be required, while all tenements or apartments or buildings with three storeys, will have to be of fireproof construction.

Wrecking the old buildings on the site of the new city hall at Spokane, Wash., was done by day labor and netted the city a profit of $1,811.40, according to a report of the foreman in charge of the work. This is $1,061.40 more than the best offer made by outside parties. The net receipts from salvage were $5,062.91, and the net cost of wrecking buildings was $3,251.51.

German Methods in Town and City Planning

Methods Differ from Those in America—The Corporation is Sovereign—Successful System of Taxing the Unearned Increment

By Frederick C. Howe.

Town planning in Germany is characterized by a comprehensive unity fully in keeping with the scientific character of the nation. Nothing is haphazard, nothing is left to chance, nothing is omitted from the calculations. Analysis of all the elements controlling the city and its proper planning precedes constructive work. It is this frank investigation of every influence affecting municipal life that distinguishes the town planning movement in Germany from that of America. In this country the city planning movement is thus far ineffectual to produce permanent and fundamental change because of our unwillingness to face the controlling influences of transportation, the unchecked license of the land owner, the unrestrained freedom of property in all its forms. Thus far, city planning in America has limited its vision to those sides of the question which do not conflict with the claims or abuses of private property.

This fundamental difference between the German city and our own is most plainly seen in the laws and municipal ordinances of the two countries relating to land. In Germany the city is sovereign. It controls the land owner and the builder in the interest of the community. The rights of the community are superior to the right of any individual, and the health, convenience, comfort and well-being of all the people are superior to and must control the rights of the land owner or the speculator.

In America on the other hand, the city is almost helpless. It has very limited powers and these are specially granted—usually after it is too late for them to be of value. Rights of eminent domain are strictly construed against the city and must be exercised with great care. Excess condemnation, in order that the city may acquire some of the profits accruing from its own improvement is denied, as is the acquisition of land for any other than enumerated things. The right of special assessments for benefits conferred is carefully prescribed by statute, varies greatly in different communities and leaves but little discretion to the cities. The individual can lay out streets of such width as he wills. He can sewer them and pave them, build them up with tenements or sky-scraping apartments and the city cannot successfully protest. In the face of all our knowledge of the vice, crime and disease which the tenement produces, old conditions in our larger cities are certainly producing themselves and the cities are helpless to prevent it.

In Germany the city is as sovereign over the property within its limits as it is over the people. It can regulate both by municipal ordinances. Its powers are ample. It enjoys nearly complete home rule. In America, on the other hand, the city is in chains to the state legislature, the real estate interests and the franchise corporation. It has the most limited powers of city building, has little autonomy and is so cramped, cabined and confined with restrictions that its powers are of little value.

The German city predicates town planning on a thorough control of the land within its limits. It treats the land as the foundation of municipality, just as does the architect when he erects an office building. City planning is fundamentally a land question. We can see this in Washington, where the city was originally designed by Major L'Enfant and President Washington in an unbroken country. The beauty of the city is attributable to the generous provision for streets, avenues, open spaces and sites for public buildings. Its commanding beauty is due to the free hand enjoyed by its designers in the control of the land.

The German city controls the land within its limits in a variety of ways. It fully recognizes the importance of its foundations. The principal methods of regulation are the following:

Street Building and Planning

In the decades which immediately followed the Franco-Prussian war, the German city followed the rectangular gridiron type of streets so universal in America, because this street plan was satisfactory to the land speculators. This period of city building in Germany presents the same monotonous suburban sections as are to be found in this country. A revolt arose against this type of streets in the closing years of the nineteenth century when street planning assumed the importance it deserves. To-day every city has a street plan as has Washington, D.C., mapped in the City Hall far in advance of the city's present growth. All street construction work is done by the city directly with its own engineer, landscape artists and contractors. A large area is undertaken at once, thus decreasing the cost and enabling it to be done in a symmetrical way. To these plans the private owner must acquiesce. He is not permitted to lay out his own streets, to pave or sewer them or control their width or character. Broad radial avenues or boulevards in conformity with the original city plan run through every new section. These streets very from 100 to 200 feet in width. They are parked and beautified and serve as a recreation and promenade way. Side streets are of ample width and are designed to harmonize with the city plan.

The cost of such development is first paid for by the city, but is assessed back upon the property benefited according to established rules. A considerable time is permitted within which the assessments can be paid by the owner, the cost being carried by the city at a low rate of interest. Thus the suburban developments of German cities are harmonious, beautiful and suited to the needs of the city.

Slum areas are forever precluded, while great economy in cost is secured through the permanency of the construction. At the same time the land owner is protected from his irresponsible neighbor, who often disfigures an entire territory by jerry construction and speculative indifference to the rights of the adjoining community. The land owner is required to dedicate a certain percentage of his holdings for streets and open spaces, and the city is authorized to take from 30 to 40 per cent. without compensation.

---

* Read before the Third National Conference on City Planning at Philadelphia Session.

The assumption is that the development work enhances the value of the adjoining property sufficiently to pay for the street development as well as the area dedicated to public uses.

The Zone System

German cities are divided into building zones in each of which the height of buildings and the amount of land which may be covered by improvements is strictly prescribed. These building zones are like the fire zones of our cities, but are prescribed to prevent congestion and the reappearance of the tenement slum. They are hygienic regulations insuring beauty as well as proper sanitation. A larger area can be covered by structures in the business section than in the outlying zones, the percentage being determined by the uses to which the land would naturally be put.

These building regulations preclude the reappearance of tenement conditions and insure beautiful and harmonious development with a uniform sky line in each zone of the city.

Industrial Sections

Within certain limits municipalities control the nature of suburban development. Factories which in any way offend the neighborhood in which they are located may be required to move to the suburbs, on the general theory that a man must so use his property that it does not interfere with a like use on the part of his neighbor. Municipal by-laws also control the factory and industrial areas. This is done by the building regulations referred to above as well as by the natural proximity to railways, docks and harbors. The territory immediately adjoining the railways is dedicated to industrial uses, and factories are required in many cities to locate on that side of the city away from the prevailing winds. This reduces the smoke nuisance to a minimum. These regulations are not made arbitrarily, but are fixed by obvious conditions. In territory surrounding an industrial area, house building regulations are adjusted to working men's homes, as are the street plans.

Land Ownership

The German city has always been a landlord on a large scale. From earliest times German villages have owned forests and other land in common and have used it for the gathering of fuel, for forestry and agriculture. With this heritage of tradition, the transition was easy into the ownership of municipal land, and German cities are buying, holding and selling land the same as private individuals. Berlin, for instance, owns land to the extent of 240-8-10 per cent. of its total area, including the land held outside of its boundaries. Frankfort, a city of 335,000 population, owns 48 9-10 per cent. of the land within its limits; Mannheim owns 35 4-10 per cent. of its own land and Hanover 37 7-10 per cent. of the land within its limits.

Much of the land so owned is in streets, open spaces and parks, but very large areas are also owned and rented or held for speculative purposes.

Cities anticipate their future needs in a far-sighted, intelligent way. Before a new territory is opened up for residence, the city authorities acquire land for play-grounds, gardens and sites for school houses and other public buildings. The purchase of these lands far in advance of the city's growth, saves the city from prohibitive prices and the necessity of cramping the sites of public buildings. It also makes possible the most generous provision for recreation and open spaces, and in the new suburbs of German cities, play grounds and gardens of the greatest variety are found within easy walking distance of almost every home.

This policy of land acquisition is but part of the far-sighted outlook on ordinary city growth and is defended on the grounds of ultimate economy as well as on those of proper city building. Only by this policy it is possible to provide adequately for the orderly and harmonious development of the city.

Taxing the Unearned Increment

After discussing the question of excess condemnation whereby increasing land values are made to pay the cost of many municipal undertakings, and the safeguarding of riparian rights by German municipalities, Mr. Howe took up the subject "German Experiments in Taxing the Unearned Increment," as follows:

Improved land is taxed less heavily than unimproved land. This tax has spread very rapidly to other cities and is yielding a very substantial return.

In the spring of this year the German Parliament, recognizing the obvious justice of this measure, adopted a bill unifying the unearned increment tax of the cities and appropriating a portion of its yield to Imperial and State purposes. The local ordinances of the various cities are repealed by this act. Under this bill the revenue of the Imperial Government is estimated at $6,000,000 per annum, which is approximately one-half of the total yield. Ten per cent. goes to the several states of the empire and forty per cent. is retained by the cities. Municipalities are authorized to increase the rate of federal taxation and retain the excess return in their local treasuries. Under this new Imperial bill, ten per cent. of the land speculators' profits are taken if the increase in value amounts to ten per cent. of the value of the property. From this it rises to a rate of thirty per cent. of the profits where the increase in value amounts to forty per cent. or more.

Municipal authorities assert that the unearned increment tax has a tendency to discourage land speculation. The burden of the tax leads to the sale and development of property and the lower rate on improved property discourages speculation still more. In addition to this, it yields a very substantial revenue, the city of Hamburg collecting $800,000 from this source last year.

The German experiment has been widely heralded in this country and proposals have been put forward for the taxation of unearned increment according to the German method. We have already, however, a much more efficient means of reaching increasing land values and a much more effective method of discouraging speculation and of forcing land into use. Up to very recently, Germany had no experience in valuing land at its capital value; the system which obtains in this country. In taxing property they adopted a method more in harmony with their system and traditions of local taxation.

In America land values are assessed in all our states each year, every other year, or at most, every fourth year. The cities of New York, Boston and some other communities separate land values from improvement values in making their assessments. These cities better than any other, show in the tax returns the increase in land values, and open up to calculation the fund available for taxation. Cleveland revalued its real property in 1910 and discovered that in ten years' time land values had increased by $177,-

000,000. During the same period population had increased by 172,000. The increase in land values amounted to $1,000 per capita. The reports from other cities indicate that this proportion obtains pretty generally in growing cities.

This source of revenue can be easily tapped by abandoning the taxation of improvements and personality and permitting the whole burden of local taxation to fall upon land values. This can be achieved in some states by a simple act of the legislature; in others by constitutional amendment. The result would be to increase the tax on land values and correspondingly augment the revenues of the communities from this source.

This is the method employed in the cities of western Canada and especially in Vancouver. In the latter city improved values were reduced by 25 per cent. in the first instance; by 50 per cent. in the second, then to 25 per cent., and finally, taxes on houses and improvements were abolished altogether. All of the direct revenues of this city are now being collected from a tax on land values.

The result of this shifting of taxation is perfectly obvious. It encourages building operations and stimulates the use of land. It becomes too costly to hold land idle. The result is an encouragement to building and the beautification of structures. There is no fear in the minds of the owner of being penalized for improvements. Further than this, speculation is discouraged. If the tax is high enough, it is made impossible. The burden of taxation is so heavy that land can no longer be held out of use. When the taxes increase to this point, land values begin to depreciate rather than constantly to appreciate, which opens up sites for building, for homes and for development.

It is conceivable that with the tax increased sufficiently, private land values will disappear altogether, for the city will have appropriated the entire rental value in taxation. This method, suggested in part by the Committee on Congestion in New York City, which proposed reducing the taxation on improvements to one-half that on land values, is infinitely preferable to the German system, for it not only will yield adequate revenues, but it imposes a permanent burden upon land speculation and gives a continuous stimulus to improvements.

New Montreal Viaduct

The largest and most costly viaduct in or around Montreal is probably that built over the Place Viger Railway Station yards along the line of Notre Dame Street. To permit of the enlargement of the Viger yards it was necessary to remove hundreds of thousands of cubic yards of earth which constituted the mound between Craig street and the water front. On the site of this land was a number of prominent buildings, including the Montreal Brewery, Viau Company's biscuit factory, Paquette's planing mill, and a number of stores with dwellings overhead. This left a big gap and destroyed the continuity of Notre Dame street. As it was necessary for this prominent thoroughfare to be kept open for traffic a temporary bridge was erected, and operations were commenced for the construction of a huge cement viaduct of reinforced concrete which has now been practically completed by the contractor, Mr. E. G. M. Cape. This viaduct is 1,006 feet long. The floor of the bridge, which is at the same time the roof of the viaduct, is 26 feet above the ground, and 52 feet wide, allowing plenty of room for two car tracks, two traffic roadways and two passenger sidewalks. In the viaduct are twenty bays of an average length of twenty feet each. Through a number of these, railway tracks enter the yards at both ends. The space under the bridge, except at the points where the tracks pass through, will be utilized for freight purposes; and on the south side of the viaduct will be two large warehouses or sheds—one for incoming and the other for outgoing freight. These will be built of steel and concrete. The work has just been commenced on them, the contract having been awarded to Mr. C. E. Deakin. At present there are twelve tracks in the yard, but there is space for seventeen, which will be separated by the usual promenades and roofed over. It will be late in the fall before all the improvements being made at the Place Viger station will be completed.

The Notre Dame Street Viaduct at Viger Station, Montreal

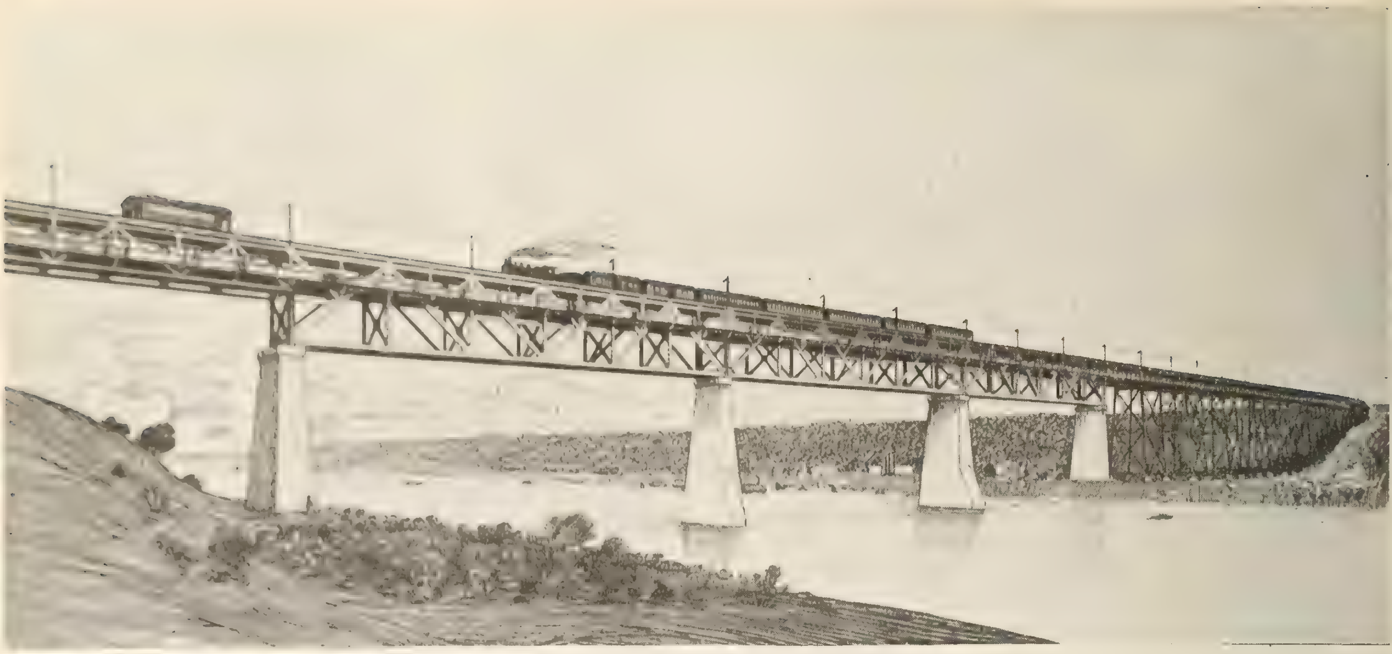
Sliding Forms for Concrete Walls

An article appears in a contemporary describing a novel method of erecting forms for concrete work. The forms are arranged to slide continuously up the wall as the concrete is poured. These are built four feet in height and are easily lifted by screws working against the pipes placed in the poured walls. The present development for these forms is for high, straight walls, but it would seem that there is plenty of opportunity for their wider application.

The cost of the labor under these forms is estimated to be in the neighborhood of 32 cents per square foot of forms for the making, and about 1 cent per square foot of wall for raising. From this it is easy to calculate where the line may be drawn between stationary and sliding forms.

If we assume that the labor cost on wall forms for building is 8 cents per square foot, and the labor on the sliding forms costs 32 cents per square foot for building the forms to 4 feet in vertical height, and 1 cent per square foot for raising them, then the point at which a wall, using sliding forms, will equal the cost of a wall using ordinary forms, will be about 18 feet in height of wall. Above that point the cost of labor on the forms would be 8 cents per square foot for stationary forms as against 1 cent for sliding forms.

It is obvious that the application of sliding forms is limited to buildings with straight plumb walls, as the forms are at present constructed. It would seem, however, that concrete design might be adapted in some cases for the use of such forms.



The Proposed Edmonton-Strathcona Bridge.

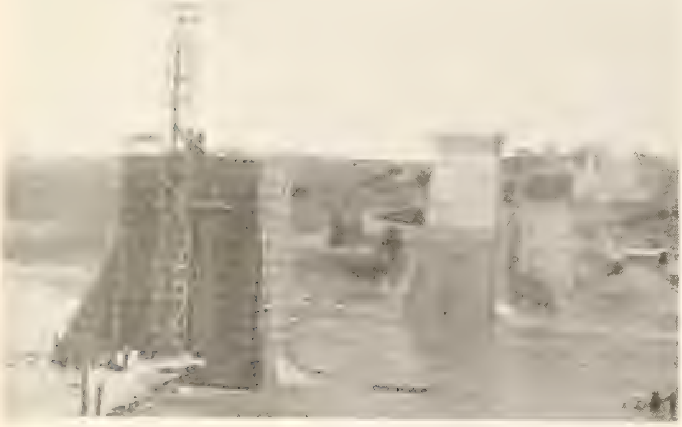
The Edmonton-Strathcona Steel Bridge

Immense Double-Decked Structure has Piers Completed—Illustration Shows Interesting Form-Work

Special to the Contract Record.

The above illustration shows the appearance this magnificent double decked structure will present when completed.

The requirements called for a single line of railway, two street railway tracks, a traffic roadway and two sidewalks. This necessitated the design of the bridge being of the double deck type, the upper deck to carry the tracks, the lower the roadway. The arrangements of the upper deck provide for a single line of railway with a street car line on each side; while the lower deck consists of the roadway, 23 feet wide in the clear, with two 8-foot sidewalks carried on brackets. The river, which at this point is 800 feet wide, is to be spanned by three large steel spans of approximately 293 feet in length, carried on four massive concrete piers which reach to a height of 96 feet above low water. The long approach to the river on the south side consists of steel towers carrying 49-foot truss spans and connected by similar spans of 97 feet 8 inches in length. On the Edmonton or north side of the river the structure consists of concrete piers and steel bents, with one steel tower.



Strathcona Bridge Looking North, River Piers Under Construction.

The river piers are of mass concrete, being 40 by 80 feet at the base and carrying on this area a sloping cutwater which rises at an angle of 60 degrees to a height of 26 feet above low water and then dies into the main body of the pier at a flatter angle. The top portion of these piers, which have a batter of 1 in 15 on all four sides, is slightly enlarged by a curve at the top and finished off with a coping. The two large piers on the north and south banks of the river are of similar design, but without the cutwater, and are 42 by 54 ft. 6 in. and 37 ft. 6 in. by 54 ft. 6 in. on the base respectively.

The method of adjusting the forms and of hoisting the concrete is shown in the illustrations; the one showing two of the four piers practically completed in so far as concrete work is concerned, and the third in an earlier stage of construction.

At the present time, three of the piers have been completed, and work has been commenced upon the abutment on the south bank of the river. The foundations for the pedestals in both river banks are also installed.

Work on the Canadian Pacific Railway dock extension at Victoria has been commenced and will be rushed with all speed, as an enlarged docking space is sorely needed.

British Dust-Problem Statistics

The Roads Improvement Association has made an investigation of the dust problem in the United Kingdom and the results have been published. The information was obtained by circularizing the road authorities in different parts of the country.

In regard to the preparation of the road for treatment with tar, 56 surveyors pointed out the necessity of thoroughly cleansing the road from dust by sweeping it first with machine brooms and afterwards with hand brooms. Other replies, while more general, indicated that the road should be in good condition.

As to the kind of tar used and the price, 134 authorities used crude or ordinary gas tar; 25 used distilled or refined tar; and 6 used oil-gas tar. The prices varied from 2 cents to 8 cents per gallon, the usual price being between 4 and 5 cents. Twenty-nine authorities used specially prepared tarry materials, such as Tarvia, Tarmite, Clare's Patent Tar Compo, and Dustabato.

Strathcona Bridge, Pier on North Bank Under Construction.

In 33 cases the area treated per gallon of tar was between 3 and 5 square yards; in 99 cases it was between 5 and 7 yards; in 19 cases, between 7 and 9 yards; and in 5 cases more than 9 yards. When specially prepared tarry materials, oil-gas tar, or ordinary tar mixed with oil was used, the average spread to the gallon was greater than when crude or distilled tar was employed.

Asked as to what material was spread over after treatment, 77 authorities replied that they used sand; 37 used small (¼ inch) granite chippings and granite dust; 10 used large (over ¼ inch) granite chippings; 14 used limestone chippings or dust; 8 used slag chips or slag dust; 19 used road grit removed from the road before treatment; and 15 used local materials, such as shingle, pea gravel, cinder dust, etc. In 5 cases no material was placed on the road after treatment. Several surveyors express the opinion that granite chippings are the best material.

As to the method of spreading the tar and the cost, in 84 cases hand spreading was used, while machine spreading was practiced in 49 cases.

The average cost for treating the road surface, including all expenses of preliminary sweeping, tar, sand, or other material spread after treatment, and labor, varied between 1.4 cents and 6 cents per square yard. The usual cost was 2 to 2½ cents when machine spread and 2½ to 3 cents when hand spread. Where two coats had been given the cost of the second coat was much lower than the first.

In 61 cases the treatment lasted a season, 6 to 9 months; in 54 cases, 12 months; in 5 cases, over 12 months; and in 5 cases less than a season. In several cases when giving the road a second treatment it was necessary to treat only the centre of the highway, the sides remaining in fairly good shape. In some districts the treatments lasted two years.

Calgary can well point with pride to its municipally owned and operated street railway system. Installed in July, 1909, with only 16¼ miles of tracks and four cars, it has been a revenue producer from the commencement. More cars were added as rapidly as possible and during the first six months of its existence the system showed a net profit of $10,001.37. In 1910 the system had 22 miles of tracks and operated 18 cars. The revenue for 1910 was $214,778.44, with a profit of $101,739.90 over operating expenses, or $55,815.28 after interest, sinking fund and $10,000 contingent account was set aside.

During the first four months of 1911, from January 1st to April 30th, the revenue was $88,336.97, and operating expenditure $63,935.90, leaving a net profit, after deducting interest, sinking fund and five per cent. of gross earnings as a contingent fund, of $24,401.60. The receipts for the month of June, 1911, amounted to $32,300.

The system as it stands at present cost the ratepayers about $500,000. On this investment a profit of 18 per cent. has been made.

During 1911 an additional $500,000 will be spent for the purpose of laying 22 miles of trackage and purchasing 12 additional cars to successfully operate the extension of the system.

Waterproofing blue prints, to be carried into wet mines or tunnels, is accomplished by the following process, according to the "Mining and Scientific Press." Immerse in melted paraffine until saturated a number of pieces of an absorbent cloth 1 foot or more square. When withdrawn and cooled they are ready for use at any time. To apply to a blue print, spread one of the saturated cloths on a smooth surface, place the dry print on it with a second waxed cloth on top, and iron with a moderately hot flatiron. The paper immediately absorbs paraffine until saturated, and becomes translucent and completely waterproof.

The Manufacture of Asphalt Paving Blocks

The Process Requires Accuracy in Combining Ingredients—Subjected to Numerous Physical and Chemical Tests—Example of Block Analysis

By Howard C. Hottel

Asphalt blocks are being used extensively on the residence streets of our larger cities and also for streets of heavy traffic in the smaller towns, and have become quite a factor in paving work.

The average asphalt block contains from 6 per cent. to 8 per cent. of asphaltic cement or bitumen, and the remainder, comprising over 90 per cent., is composed of crushed stone, known as the mineral aggregate, the coarsest particles of which are not larger than ⅜-in., and exceedingly fine dust or filler, composed of limestone or cement, or a mixture of the two.

Trap rock has been found to make the best mineral aggregate. The stone brought from the quarry is first crushed and then separated mechanically into two classes, called fine and coarse material. The former, as it leaves the crusher, passes into a storage bin and seldom contains any stone larger than 0.1 in.; the latter enters another bin and contains the larger particles of stone.

The fine and coarse stone flow by gravity from the storage bins to a rectangular shaped weighing box mounted upon a scale. The proportion of fine material, coarse material and filler are weighed into the box and then dumped into the mixer.

The mixer consists of a rectangular shaped shell with semi-circular bottom, through the centre of which there are two horizontal square shafts, fitted with blades, or teeth, as they are commonly called. The teeth are made in two different shapes, called right-hand and left-hand, and are so set upon the shafts that when the shafts revolve they work the material horizontally towards the centre, and at the same time are continually tossing it vertically.

After the fine and coarse material and filler have been dumped into the mixer, the asphalt cement is then poured or run directly into the warm, dry mixture.

In the preparation of the asphalt cement great care is taken in combining the asphalt and flux. The asphalt is weighed out, melted and raised to a temperature of about 300 deg. F. The flux which has also been previously heated is slowly run into the melting tank containing the asphalt. The two are then agitated, with air or steam, until thoroughly mixed, which generally requires from three to four hours.

The result of mixing the asphaltic cement with the dry mineral aggregate produces within two or three minutes an absolutely homogeneous mass. After this is accomplished the hot mass is discharged into a truck or dump car by pulling a lever, which opens a slide in the bottom of the mixer.

The hot mixture is then ready to be shaped into the form of a block. The block presses are operated by electric power and the hot mixture as it falls into the mold box is subjected to a total of one hundred and twenty tons pressure. This pressure is applied to the top, bottom and two sides of the block by four springs. The hot mixture is carried by the dump car to a platform above the press. From here it is shoveled into a hopper which leads down to the mold box. The press is then started, and after the springs have compressed the hot mass into the form of a block, it is carried forward, as the springs relax, and falls upon a sloping iron plate. Here it is caught up by a laborer, measured and inspected. If it is out of shape or distorted it is cast aside. If it measures up satisfactorily, it is placed upon a conveyor and is cooled by passing through water. After emerging from the water bath, in which they have remained from 15 to 20 minutes, the blocks are again measured, placed upon cross conveyors, loaded upon cars and are then ready for shipment.

One batch of 1,500 pounds, from the mixer, will make from 70 to 80 blocks, and a plant with five presses in operation has a capacity of from 20,000 to 30,000 blocks a 10-hour day.

Physical and Chemical Tests of Asphalt Blocks.— Various physical and chemical tests are made upon asphalt blocks to determine their probable efficiency. The principal ones include breaking, rattler and impact tests, while the main chemical one is the extraction of the bitumen.

The breaking test is made as follows: The block is placed upon two lateral supports with the widest face uppermost. These supports are equidistant from the middle of the block and the pressure is applied, at the middle, along a straight line across the entire width of the block. As the wedged shaped piece of cast iron passes down upon the block, the amount of pressure required to break the block is automatically registered. It should be noted here that the block which gives the highest value in this test is not necessarily the best block, as one made with an extremely hard asphalt cement gives a higher test than one made with a cement of greater softness, which quality is more desirous in a cementing material. The value obtained by this test is also known as the modulus of rupture, and if it is required to perform the test at other than ordinary temperatures, it can be done under water cooled or heated to the temperature desired.

The impact test is supposed to represent as nearly as possible the blows of traffic. The block is firmly placed upon a cement base and the blow is delivered through a spherical end plunger resting upon the centre of the widest face of the block. The block is so adjusted that the spherical end of the plunger is pressed firmly upon it by two spiral springs, which surround the plunger guide rods. The blow is struck by a hammer weighing 2 kilograms, which is raised by a rope and pulley, and released automatically. The test consists of a 1 cm. fall of the hammer for the first blow, and an increased fall of 1 cm. for each succeeding blow until the block breaks. The number of blows required to break the block represents the toughness. This test can be made at nearly any temperature desired and is easily operated. It was first designed by L. W. Page, director of the United States Office of Public Roads, for the purpose of testing rock.

The rattler test is supposed to represent the wear and tear upon a pavement from horses' hoofs and wagon wheels. It consists of placing from 18 to 20 blocks in an iron shell, which is made to revolve. After the blocks have been tightly wedged into position, so that they will not move and so that they present a level surface, a shot charge of fifty pounds is next placed in the rattler. The shot are composed of 2½-in. cast iron cubes, having sharp corners and weighing about four pounds each. The cover is then placed upon the rattler and it is revolved at a uniform speed of 37 revolutions per minute. The revolutions of the rattler are recorded automatically upon a dial and one test consists of 10,000 revolutions.

The blocks are weighed before and after the test and the loss in weight calculated to percentage and the average loss reported. This test can be performed at almost any temperature desired, providing the rattler is installed inside a small ammonia refrigerating compartment which can be operated in conjunction with the rattler. Out of over thirty different tests made by the writer upon blocks made from Trinidad asphalt, Bermuda asphalt, Gilsonite and Bermudez asphalts and California Pitch, the average loss was 8.7 per cent. The highest loss of any one lot of blocks was 10.98 per cent., the lowest of any one lot 7.02 per cent.

The percentage of bitumen is obtained by extracting with either cold carbon bisulphide or hot benzol. The former determination is made by placing several hundred grams of the mixture from which the block is made, in a bronze cone. The cone comes in two pieces, and after the material is placed inside, the top piece is firmly fastened to the bottom with a felt ring intervening. Carbon bisulphide is then poured in through openings in the top, the cone is swung in a small centrifugal machine having an unusually high speed, and the solvent filters out through the felt ring. The operation is repeated until the solvent comes through clear. The latter method consists of placing the material in a Soxhlet apparatus and making a continuous extraction with hot benzol.

The analysis of a block picked out at random is herewith appended:

Size—12 x 5 x 3 inches.
Weight in air—15 lbs. 7 oz.
Weight in water—9 lbs. 4 ozs.
Specific gravity—2.5.
Voids—2.3 per cent.
Appearance of block—Compact.
Impact at 77 deg. F.—46.
Bitumen—7.3 per cent.

Passing	200	mesh	sieve—	17.1	per cent.
"	100	"	"	6.3	"
"	80	"	"	4.0	"
"	50	"	"	4.0	"
"	40	"	"	3.3	"
"	30	"	"	1.7	"
"	20	"	"	6.3	"
"	10	"	"	12.0	"
"	8	"	"	8.0	"
"	4	"	"	28.0	"
Retained on	4	"	"	2.0	"

Specific gravity of mineral aggregate—2.92.
Character of mineral aggregate—Contains weathered stone.
Penetration of asphalt cement—30.
Ductility of asphalt cement—15cm.
Average loss in rattler—7.5 per cent.

The density of the mineral aggregate is then secured by using either Jackson's or La Chaslier's apparatus, the same as are used universally in determining the density of cements. The mineral aggregate is then passed through various sieves in order to determine whether it is graded properly, and this completes the analysis of an asphalt block.

From the amount of bitumen, the density of the block and the density of the mineral aggregate, the voids are computed. Some of the better grades of block will run as low as one per cent. in voids, which goes to show that the mineral aggregate is thoroughly coated with the asphalt cement and that enough filler has been added to make a compact block.

—Good Roads.

Testing Concrete Materials

A progress report on testing materials and specimens of concrete was given by the Tests Standing Committee of the Concrete Institute at its annual summer meeting in London. The materials employed in concrete were classified under the headings of coarse material, sand, cement, water and steel. The report dealt with coarse materials for reinforced concrete that passed a ¾-in. mesh but were retained on a ¼-in. mesh screen, and classified them as pit gravel, crushed pit gravel, river gravel, crushed river gravel, sea gravel, crushed sea gravel, crushed rock, crushed brick, crushed slag, clinker and coke breeze, but did not recommend slag, clinker and coke breeze as suitable for reinforced concrete. Very little information had been presented to the committee on the grading of coarse materials and sand, but it was of the opinion that to obtain the best results in concrete these materials should be properly graded.

As the result of tests, the rejection of sand that is not retained on a No. 50 screen was recommended. It had been found, the report states, that standard sand and cement in a proportion by weight of 3 to 1 had a crushing strength of 2,789 lb. per square inch after 28 days, and porphyritic granite or blue whinstone crushings which passed a No. 30 sieve, including all dust, had a strength of only 606 lb.; the tensile tests were respectively 234.6 and 104 lb. per square inch. The crushing strength should be ascertained by means of cubes of 3 parts of standard sand to 1 part of cement by weight, made up and treated similarly to briquettes of sand and cement for the tensile test. These cubes should be 3 inches on a side and the crushing strength not less than ten times the tensile strength at twenty-eight days, as required by the British standard specifications.

Steel reinforcement should show an ultimate tensile strength of not less than 60,000 lb. per square inch, an elastic limit of at least 34,000 lb.; the contraction area at fracture should be not less than 45 per cent.; a bar 1 inch or less in diameter should show an elongation of not less than 25 per cent., measured on a length equal to eight times the diameter of the bar tested. If the bar is over 1 inch in diameter the elongation should be measured on a length equal to four diameters of the bar, and should be not less than 30 per cent. All steel should be subjected to a bending test to an angle of 180 deg. around a diameter equal to that of the piece tested, without fracturing the skin.

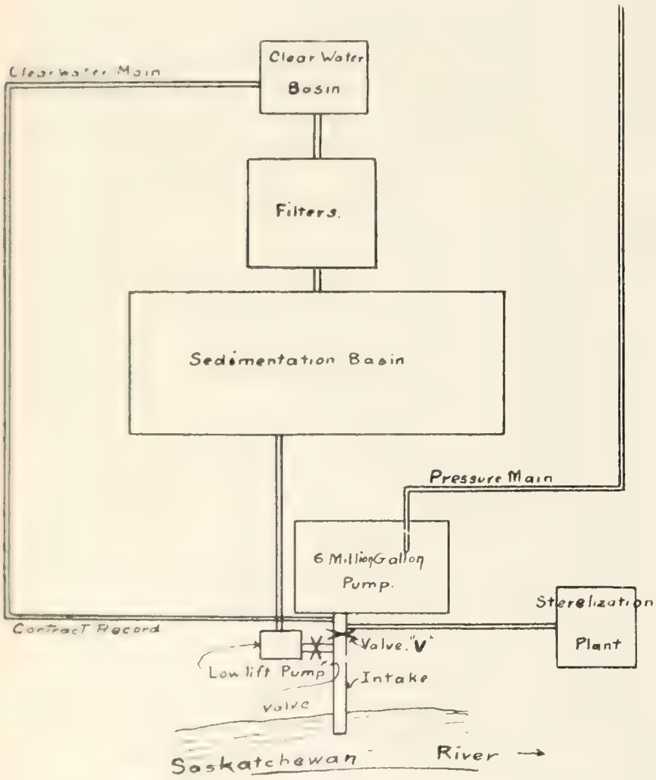
The sawmills of the Riordon Paper Company at Calumet, Que., were destroyed by fire at a loss of nearly $1,000,000.

City of Edmonton Sterilization Plant

Turbidity of Saskatchewan River in Summer causes Annoyance—Choride of Lime Apparatus Employed—Description of the Plant

By H. P. Burrell, Special to the Contract Record

The City of Edmonton, which is situated on the north bank of the Saskatchewan River, draws its water supply from the river direct by means of intake pipes, which are carried out into the river. In the winter months the water is pumped directly from the river to the mains, as at this time of the year the water is clear. In the summer months, however, when the water is very turbid, the filters are put in use, and part of the water supplied is filtered. As there is no settlement higher up the river, the water can be considered free from bacteria, and for this reason the system was considered satisfactory until last winter.



Diagramatic sketch of Pumping Plant.

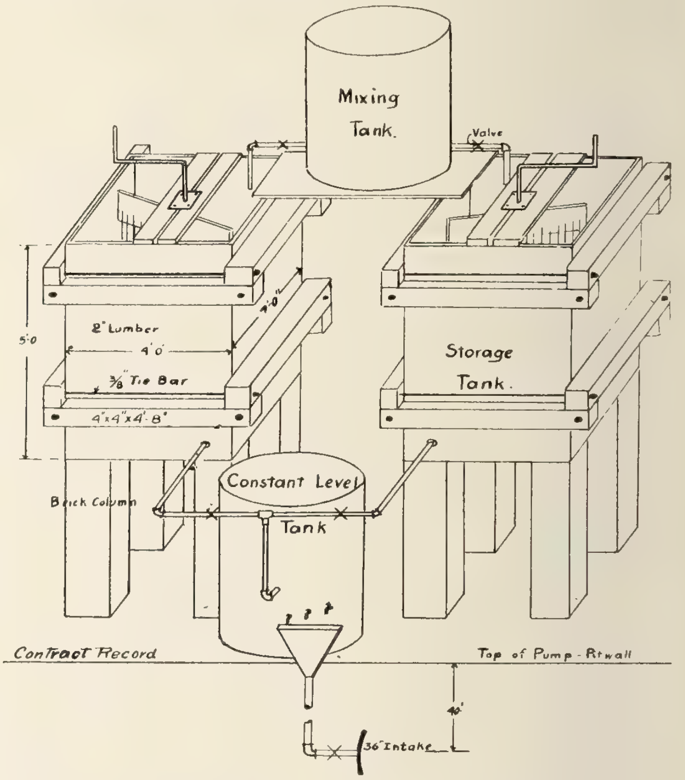
In December, 1910, a typhoid epidemic broke out in the city of Strathcona, which is separated from Edmonton only by the river, and soon became so serious that the authorities decided to sterilize their supply of water. This water, which was drawn, like Edmonton's, from the river, was allowed to filter through the gravel of the river bed, and was pumped into the mains from wells, while the water from Edmonton had no filtration or treatment of any kind whatever.

Although the epidemic was confined to the south side of the river, the City Commissioners of Edmonton thought it advisable to erect a sterilization plant, so that should anything occur to warrant it, the water could be sterilized.

The water is pumped into the mains by two pumps, each with a separate intake and separate main for some distance after leaving the plant. The two pumps consist of a centrifugal pump direct coupled to an electric motor having a rated capacity of three million gallons per diem, and a triple expansion steam pump of six million capacity per diem.

It was decided to place the sterilization plant where it could treat the water pumped by the six million gallon pump, the smaller unit being kept more as a stand-by, and if the water from both pumps were to be treated, it would mean fitting up two independent plants for reasons given above.

Fig. 1 gives a general idea of the pumping plant, the plan in choosing this layout being to draw the water through the 36-in. intake and in winter to pump it direct into the mains. In the summer, however, the valve V would be closed and the water lifted by a low-lift pump to the sedimentation basin, from which it was to flow by gravity to the clear water basin by way of the filters. From here it would find its way back to the intake, back of the valve V, and so into the pump.



Prospective sketch showing general disposition of plant.

The sterilization plant had to be so placed that the solution would flow into the intake, after all possibility of contamination was over. As the clear water basin is uncovered, the solution is fed in back of the valve V and is thus available for both summer and winter. The solution will be thoroughly mixed in the mains for it to act before delivery to the consumer. The pump stands in a pump pit over forty feet deep and the sterilization plant stands on the wall of the pump pit over the intake.

The plant (see Fig. 2) consists of one mixing tank, from which the solution flows into two storage tanks fitted with agitators, from there to a constant level tank, and then to the intake.

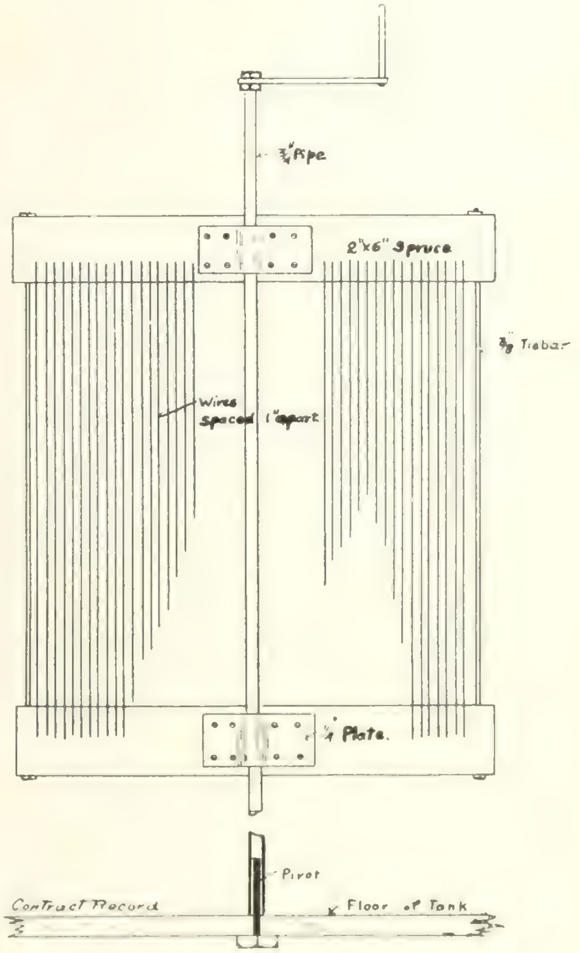
The mixing tank is made from a 2-foot concrete sewer pipe with the bottom closed in with a 1 to 3 cement mortar. The sides of the pipe were also brushed over with cement to make them quite water-tight.

Graduations are provided giving the amount of water required for 1, 1.5 and 2 pounds of chloride of lime to give one-half per cent. solution. A 1-inch water main was extended to give water to the mixing tank, as a great deal of time is taken up making the solution. When the chloride of lime is completely dissolved, the solution flows by way of two 1-inch iron pipes, fitted with valves, into the two storage tanks. These tanks are built of 2-inch tongued and grooved pine and are 4 x 4 x 5 ft. high. The sides are held against bulging by 4 x 4 in. pieces of tamarac, tied together with ⅜-in bolts. The agitators are made as follows: to a ¾-in. iron pipe 6 feet long, are bolted two pieces of 2 x 6 in. lumber, 3 ft. 6 in. long (see Fig. 3). These pieces are held together at their ends by two ⅜-in. bolts, and from other points, about 1 inch apart wire strands are stretched from one to the other. The top end of the pipe is fitted with a handle and the lower end fits over a bolt, which goes through the base of the tank and forms a pivot. The agitators worked very well, the wires causing a great many currents in the solution. The inside of these tanks was painted with three coats of waterglass, to see if this would protect the wood from the action of the solution. The tanks, however, proved to be far from water-tight, and so they were plastered with cement mortar one-half inch thick on metal lathing, so that the waterglass was not given a trial. From the storage tanks, the solution flows through two 1-inch pipes, fitted with valves, to the constant level tank. This is also made out of 2-inch sewer pipe and fitted with a float valve to regulate the supply, and three taps with different hydrostatic heads, to regulate the discharge. The float valve worked very well, and as the opening is only one-half inch and the solution brought to it by two 1-inch pipes, the flow is so much faster through the valve, that there is next to no chance of incrustation changing the flow in the future. The taps are placed at 17-in., 18-in. and 19-in. from the water level, and each tap is opened to its fullest capacity when in use. The reason for this was, that it would not be satisfactory to use the taps partly open, owing to the uncertainty that would exist as to the amount flowing through the taps. The taps used were found to give too great a discharge, so that the ends were plugged with solder and drilled with holes 3-32 inch in diameter. Here also the flow would be very fast through the regulating aperture, so that there would be hardly any chance of incrustation here to change the flow.

From the taps the solution flows into a funnel, and from there into the intake by way of a 1-inch pipe. Just before the pipe connects with the intake, a valve has been fixed, and when the plant is working, the valve may be partly closed, so that the pipe is partly full of solution, this preventing the pump from sucking air. When not in use the valve may be closed completely and all air shut out.

The graduation of the apparatus was based on the revolutions per minute of the pump. For a certain number of revolutions, certain taps had to be opened, and if the speed of the pump varied, the combination had to be changed to suit the new speed.

Owing to the fact that this plant acted only on the water pumped by the six million gallon pump, and that at the time of the installation this pump was under repairs during the day, tests on the water could not be carried out, as there was always a lot of untreated water in the mains. However, as the solution used was one-half per cent., and the displacement per revolution of the pump also known, it was easy to calculate how much solution would be used for a given speed of the pump. The storage tanks were filled up and the level of the solution carefully ascertained after the tap to be tested had run long enough to insure the level in the constant level tank having become constant as with the taps closed. The level was about 1½ inch higher than when the plant was in operation. The solution was then allowed to flow for twelve hours, and the difference in level being ascertained, the amount of flow per minute through the tap could be calculated, and thus the corresponding number of revolutions per minute of the pump for that tap found. This was done for each tap and each combination of taps giving the table below.



Agitators for storage tanks.

No. of tap to be used per R.P.M. of pump.

R.P.M.	20	27	30	37	50	57
Tap No.	1	1 & 2	3	3 & 2	1 & 3	1, 2 & 3

For permanent operation the water could be tested, and thus any uncertainty as to the slip of the amount and value of free chloride in the chloride of lime would be of little account.

If a plant of this description be not in use, it should be drained out and allowed to stand dry, since if not, the rust will eat into the iron parts of the float valve, change the level in the constant level tank, and render all former graduations useless. In fact, all steel or iron around such a plant much be well looked after, as the chloride of lime soon rusts it.

Building Laws

The first requisite is clearness—what the law intends must be quickly and readily understood. A code should also, as far as possible, be concise in form. Its provisions should be expressed in short, separate sentences, not in long involved paragraphs. Precision is of vital importance. All terms should be carefully defined. On the other hand, such laws must be so drawn as to stand the test in the courts. In a word, they should be as if written by laymen for laymen, and yet at the same time so carefully drawn that every word has its exact legal value and says neither more nor less than is intended.

The great and vital thing overshadowing all others in importance is that there shall be uniformity of treatment for all persons affected by a building code. There must be no discrimination between individuals, nor any opportunity for such discriminaiton. Affecting, as it does, vast property interests, it must be based upon foundations of justice and fairness.

Discretionary Powers.—And yet, it is at this point that most building laws fail, viz., in their treatment of the granting of discretionary power to the enforcing officials. Every architect and every builder will tell you that he is in favor of discretionary power, that it is essential, as the building industry is a constanly changing one and because building laws cannot be rigid.

There must be flexibility to them or the building industry will suffer; the architect must have free play for the exercise of his originality. If you question him, however, he will admit that it is in the exercise of this discretionary power that municipal corruption lies.

In this subject is wrapped up nearly everything of importance in a building code. There is little use in providing with minute care for the thickness of walls of certain heights; the methods of building firestops, the way in which plumbing shall be vented, if at the same time you give to your enforcing official the power to change all these requirements in his discretion.

Even with honest public officials, large grants of discretionary power are unsafe. They inevitably lead to favoritism, discrimination, arbitrary use of authority and nullification of the legislative intent.

There is much misunderstanding about the question of discretionary power, not only in regard to what it is, but also as to its necessity. In my opinion, the position of architects, builders and others in favor of large grants of power cannot be successfully maintained. Their contention, however, that building codes should be elastic enough to provide for changes and improvements in methods of construction is sound.

One does not involve the other. It is entirely feasible to provide sufficient elasticity to permit the use of new material and new processes as these develop, without at the same time vesting in the enforcing officer the power to modify and set aside every provision of your building law. The granting of such power breaks down every principle of sound government. From time immemorial it has been recognized that enforcing officers should not also be legislative ones.

The New York City Code is a local ordinance, adopted by the aldermen, who meet once a week, and it is very easy—if some provision of a building law is wrong—to secure the necessary amendments to it through the regular legislative channels. No hardship is thus involved.

This is the only way in which building codes should be amended, namely, by the legislative bodies which enact them, not by administrative officers. Most important of all, however, is the fact that when a code is amended in this manner, the code is amended generally and affects all citizens equally. The public also is aware of what is going on and knows what it has to expect. It is also in a position to make known to the local legislative officials the reasons for or against any proposed change, and bring to bear upon them the full force of public sentiment.—(Record and Guide).

Prepared Roofing

Since the wholesale destruction of our forests and the general rise in the cost of shingles and other building materials, a demand for some other roofing material as a substitute has been created throughout the country. To meet this demand, materials of all classes—sheet metal, clay products, slate, cement and finest grade of refined asphalt—have been used to manufacture an article for this purpose. Unfortunately there has been much deception in this trade, says the Carpenter and Builder, for there has hardly been a roofing whose merit has won it a position in the market, but it has been followed by a cheap article with a cheap price, which from its looks could hardly be detected from its better made competitor.

There is one thing clear, however, which is, that the prepared or "ready" roofings have come to stay; that they are filling a position in our markets where there has been a lack; and to-day they hold one of the foremost places in the general building trade among hihgl grade roofing materials. Further, a man who really wants a good roofing can get it by asking for it, provided he does not merely buy on a price basis but purchases those grades made by the standard concerns throughout the country.

Prepared roofing might be classified under two heads: 1, smooth surfaced roofings; 2, gravel, feldspar, slate chips, or other mineral surfaced roofings.

Smooth Surfaced Roofings

The smooth surfaced roofings have one layer of felt, which is usually saturated with an asphaltic liquid. This felt is surfaced on both sides with a thin coat of asphaltic material and finished with soapstone or something of similar character. In making the better grades of roofing they simply increase the thickness of this saturated felt, using similar asphaltic coatings and finishing materials. The terms "one-ply," "two-ply," etc., used to distinguish different grades, thus refer to the thickness of the felt and not to separate layers of material. In all reliable brands good quality felt is required in the manufacture, good material used in saturation, and great pains taken that the felts are thoroughly saturated and literally filled with the asphaltic products used for this work. The manufacture of the felt is itself a most important consideration, as it requires skill and care to combine the necessary high absorptive power with sufficient tensile strength. Smooth surfaced roofing is supposed to be coated every few years and the coating for this purpose is sold by the manufacturer.

Mineral Surfaced Roofings

The surfaced roofings are made mostly from high-grade asphalts, applied on top of a foundation of alternate layers of felt and asphalt, the felts being lighter than those used in the smooth surfaced roofings. The upper layer of this asphalt is thicker and is heavily coated with gravel, mica, slate or some other mineral rock. These roofings differ from the smooth surfaced in that the latter depend largely upon the saturated felt, both for strength and durability, while in the rock-surfaced roofings this is not the case, the chief function of the felts being to support a greater amount of weather proofing material. There must be enough felts in the foundation to carry this extra material and furnish strength enough for easy handling in the trade and in application.

The roof is based on the theory that the asphalt and mineral surfacing used in its construction is in itself, when properly applied, indestructible, while the felt is more perishable—as is proved by the fact that it is of little use in a roof until thoroughly saturated with the asphalt mixture. Thus, in making roofing for high-grade buildings, where permanent durability is necessary, the mineral surfacing and asphalt are increased in quantity rather than the burlap or felt. These roofs have to be recoated at but rare intervals when manufactured from a good grade of asphalt.

Although the smooth surfaced roofings and the gravel or mineral surfaced roofings are often sold and recommended in competition with each other for similar purposes, and though both, when properly made, are good roofs, they really belong in two different classes of trade. The smooth surfaced goods—which are much lighter in weight than their gravel and mineral surfaced competitors, are used for the lighter construction work. They find a ready sale among merchants and dealers throughout the country, and, because of their lightness in handling and comparative cheapness in price, appeal to the general trade. Smooth surfaced roofing has one great drawback, however, that for some reason—possibly because its use has spread so rapidly—there are more cheap imitations of it than of any other roofing material in the country, and its purchase should be based on careful investigation.

The gravel and mineral surfaced roofings are sold largely in the general trade, but more particularly where permanent roofs are wanted. They make a fine appearance on residences and all classes of buildings when properly applied, and the fact that they are heavier than the smooth surfaced goods appeals to the higher class trade; but the difference in weight interferes with some grades of mercantile business because it makes an extra bother in handling. As a result, this business drifts towards large permanent work, such as fine business blocks, large buildings for factory and railway use, a large class of farm buildings, etc. An intermediate roofing is made by most of the manufacturers of the gravel and mineral surfaced roofings for the cheaper and lighter trade by using sand instead of gravel surfacing and a lighter top coat of the asphalt covering.

In prepared roofings quality as well as looks must be considered. Without exception, the manufacturers of high-grade roofings have recognized this fact and standard grades of refined asphalt are used in the manufacture of the roofing in combination with best grades of long-felt, wood felts of high absorbtive power, insuring thorough and complete saturation.

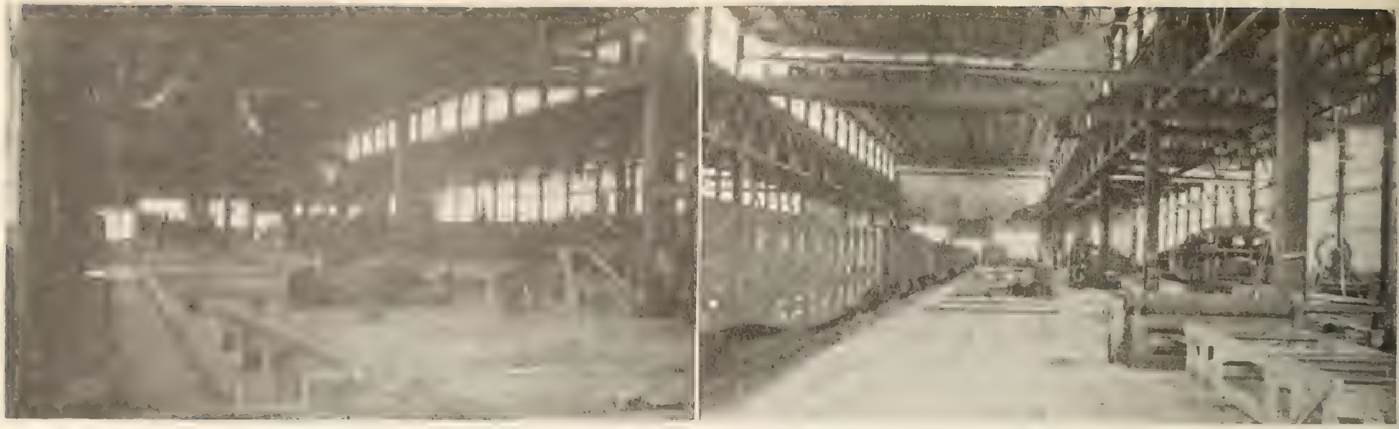
Water-tight Joints

The first question an architect or practical builder considers in connection with a prepared roofing is the joint. This point needs attention. Some recommend using for the joints the hard cement of which the roofing is made, instead of the liquid cement. This hard cement is not quite so easy to apply, as it must be raised to the proper temperature; but it is more likely to ensure a tight roof. Some makers also lap the sheets from three to six inches instead of the regular two inches. A still greater improvement appears when a close weld with hot asphalt is made with the upper sheet to the two-inch lap of the lower surface of the under one, from which the mineral surfacing has been removed, leaving a surface heavily coated with asphalt.

The six-inch welded joint illustrated herewith, made by one of the leading manufacturers, merits special mention, for it not only has the principle of the joint produced by removing the mineral surfacing, leaving the heavily coated asphalt surface ready for the hot weld; but, in addition, has a four-inch extension of single felt beyond the ungraveled, marginal edge, which, when coated with hot asphalt of right temperature, gives an additional weld of a layer of felt as permanent as any other of the layers of felt used in the composition of the roofing. This joint is so perfected that it is not necessary to drive a nail through from the top of the roofing, all the nails necessary to be used being driven through the lower sheet into the roof and covered with the upper layer, which is then welded to the lower sheet.

The growth of the prepared roofing business during the last few years has been marvelous. Twenty-five years ago shingles, galvanized iron, tin, and slate represented all the grades of roofing sold, except a cheap felt for temporary work. To-day, in practically every city in the United States, from one to dozen different brands of high-grade roofing material are sold by the dealers. In Canada, nearly every town has dealers handling roofing, while in Buenos Ayres, S.A., at the recent exposition, the highest prizes were awarded to three grades of prepared roofing manufactured in the United States, and a fourth received honorable mention.

A recent suggestion regarding fireproof construction involves an idea which could be worked out to the benefit of better construction—that of levying taxes in relation to the risk from fire. If a fire tax were levied separately, the tax to be graded in proportion as the structure involved increased or decreased hazard, the net result would be to encourage the forms of construction which would decrease the fire risk. There could be no objection to admitting the public benefit by decreasing the risk in the form of a lower tax than such construction which tends to increase the risk. The present method of taxation tends to encourage the cheaper form of construction and also to penalize the safer construction by making it bear a proportion of its share of the cost of fire protection which the construction does not require.



Interior of No. 1 Structural shop showing both right and left sections

New Plant of National Bridge Company

Extensive Steel Plant in Operation—Admirable Location—Rapid Construction—Mr. J. L. Brower is General Manager

Special to the Contract Record

Power has been turned on and the work in the shops started for this, the newest of the large steel companies in Canada. As first stated to the Contract Record last January, the plant was expected to be complete and in working order about July 1st, or just six months from the date that ground was first broken for the main buildings.

The machinery is all installed and all parts of the shops are now working full time. Power is supplied by the Shawinigan Falls lines of the Montreal Light, Heat & Power Company. No steam is used except for the heating of the buildings in winter. The staff organism is complete, even to the smallest detail, and a large number of draughtsmen are now engaged on contracts for a number of buildings and bridges.

The plant is located directly on the Canadian Northern Railway lines near Dominion Park, in the eastern section of Montreal and also has access to the St. Lawrence River wharves adjoining the company's property. Very rapid construction has been made, and this is creditable also to Canadian manufactures, as the manager has stated that about 80 per cent. of the machinery has been manufactured in Canada.

The present capacity of the plant is 20,000 tons, which will be increased to 40,000 tons by the erection of No. 2 bridge shop during the coming winter. This will bring the new plant to first or second place in the ranks of the bridge and structural companies in Canada for size and capacity.

Front View of National Bridge Plant at Longue Pointe

The buildings now complete and in use are the main No. 1 structural shop 350 feet by 137 feet, and the power house, machine shop, templat shop, erection and paint houses, and stick yard, running of 80-

foot span and 400-foot run, the shipping yard, runway and cranes, 50 feet by 150 feet.

Among the numerous contracts already booked and going through the shops are the steel work for the Arena Gardens Company's rink, Toronto; the new power house for Canadian Westinghouse Company, of Hamilton; the St. Henry car barns for the Montreal Street Railway Company; the Strachan Building, the Walter Baker Company's building, extension to Macdonald College at St. Anne's and the Beauchemin foundry at Sorel.

The plant and mechanical equipment was designed and the construction carried out under the supervision of the general manager of the company, Mr. J. L. Brower, M.C., C.E., who is well known in the steel business.

The general contractors for the building were Messrs. Peter Lyall & Sons, to whom great credit is due for the rapid construction during the severe weather of the winter months.

The National Bridge Company is capitalized at $4,000,000, only a part of which has been issued. The directors are all men of large means and prominent in the financial world, and include Messrs. J. N. Greenshields, Wm. Lyall, W. G. M. Shepherd, H. W. Beauclerk and the Hon. Robert Mackay.

A number of houses are now being built adjoining the works for employees, and further extensions are being planned.

Building Operations in Winnipeg

While the building permits issued in the city of Winnipeg for the first six months of the present year are slightly below those of the corresponding period of 1910, the difference is but a slight one, and lacking some of the large individual items which advanced last year so rapidly, would seem to represent an even greater development. There is one comment which should be made on this year's figures, and that is in the way of regret that they only include the building actually within the city, while there are many thousands of dollars' worth of work being done just outside the city limits. These districts receive a certain amount of fire protection from the city's service, for a large part of them can be reached from the city's hydrants in case of necessity; they are connected with the city telephone centrals, and they have the advantage of the same railway fares.

Another feature of the year is the rapidity with which the work is being carried on. The entire absence of labor troubles of a serious nature, and the fact that building materials have been plentiful at easy prices, have had a great deal to do with the amount of construction undertaken. Labor, too, has been plentiful and of fair quality. The erection of the grand stand at the Industrial Exhibition affords an instance of the elasticity of the labor situation. Without interfering with work in progress the city was able to secure sufficient capable men to erect a stand containing three-quarters of a million feet of lumber in five days. It took day and night shifts to accomplish the work, but it was done on time. Then, too, the material was available, and the rush demand for this amount of stuff has not crippled the local supply.

There is a large amount of residential building in this season's operations, probably a greater percentage than ever before, and it is notable that there has been a marked improvement in the character of the residences being built. This applies to the speculative building as well as to the homes. The large items in this year's programme are the three banks now in course of erection. When completed they will be among the finest structures in the city.

This year has also seen an increase in the number and size of the ferro-concrete buildings. These, with terra-cotta or tile facings, have won rapidly to popularity, and it is predicted that the next few years will see concrete an even greater factor in Winnipeg's building situation. In the past, mill construction has been favored for warehouses, but several heavy fire losses during the past two years have demonstrated the insecurity of this type of building.

At the present time there is every indication that this year will exceed last year's building figures by a couple of millions at least. There are many who insist that there will be at least a twenty-five per cent. advance, and it must be confessed that there is a certain amount of justification for their optimism. The first two weeks of July saw the permits advance by leaps and bounds until now they are well in advance of last year's figures. This advance was forcasted in the Contract Record several months ago, when the question of the new provincial health by-law was taken up. The Provincial Act, passed at the last session of the House, placed stringent regulations upon apartment and tenement houses. Plans then in preparation were held up, but a stay was granted until July 15 for the new Act coming into force. The result was a heavy rush at the building inspector's office during the closing days of the extended period. It is predicted that if the Act is permitted to remain in force, it will materially affect the development of apartment houses, and it is expected that amendments will be submitted at the next session of the House.

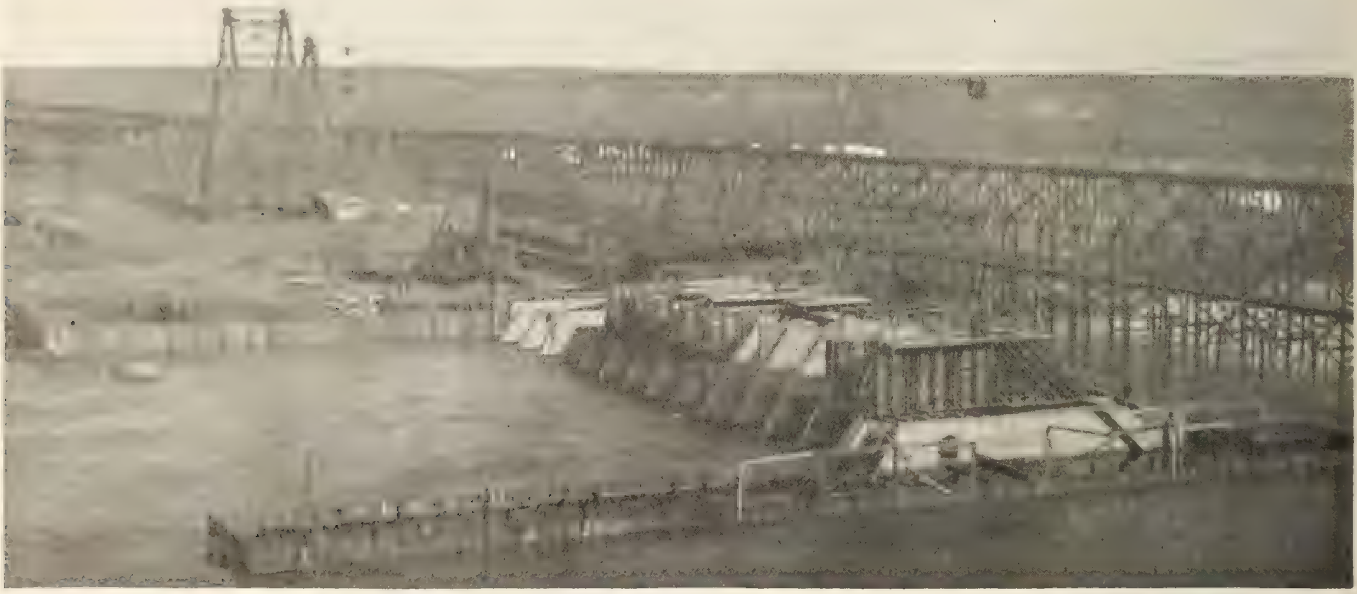
Another factor in the building situation has just developed which may have a great effect on the year's figures. It is the announcement that the C. P. R. is planning extensive improvements and enlargements to their present hotel and depot. An annex will be built, a part of the depot will be raised two storeys to give more office room, a special building will be erected to house the Dominion Express, Railway Mail department, heating system and hotel employees, while on the north side of the track there will also be a large structure put up to make room for enlarging departments which cannot be adequately accommodated at present. If the Lord Selkirk Hotel of the Grand Trunk Pacific is also proceeded with this year, the 25 per cent. increase estimate will be well within the mark.

Concrete Pavement

That concrete will eventually prove to be the best obtainable and only truly economical paving material for streets and roads there can be no reasonable doubt. Not in the form of patented "granitoid" or "litholite," or any other imaginary, mysterious or exclusive way of false pretenses to make the price higher than it should be, but just simple, well understood and properly designed low-priced concrete. As a finished proposition it is reasonable to expect that it will not be "everlasting" or "faultless," or any other impossible and undesirable thing—simply the cheapest good paving, fully up to all sane requirements, and low in cost to keep repaired in a condition to meet the needs of traffic. There will never be a scarcity of good material for concrete aggregate, and Portland cement can be produced in sufficient quantities to take care of even this much of a demand.—Rock Products.

Progress on the Horseshoe Dam, Alberta

From the accompanying illustration it is evident that good progress has been made on the great concrete dam that is being built across the Bow river at Horseshoe Bend, some 80 miles east of Calgary. This dam is being erected by the Irrigation Department of the Canadian Pacific Railway to divert water into the main canal of the east section of the irrigation block. It will consist, when completed, of an earthern embankment on the south bank of the Bow river, and a reinforced concrete spillway in the existing river channel, connected at its northerly end with the canal head gates. The river is approximately 600 feet wide at this point, its south bank having a gravel beach several hundred feet in width, and gradually rising to the general prairie elevation. The earthern embankment upon it will be about 7,000 feet in length, and 350 feet in width at the thickest part of the base, containing approximately one million cubic yards of earth. Its upper slope will be paved with boulder concrete or reinforced concrete slabs.



Horseshoe Bend Dam on Bow River under construction, May 20

Horseshoe Bend Dam looking north

The spillway will take care of a flow of 100,000 second feet of water, the total length of weir being about 600 feet in order to prevent an excess head at the crest.

Excavation for main canal "B" bed

The structure will be 720 feet in length, between abutments. The overflow crest will be at a maximum height of forty feet, above which eleven feet of water will be retained by structural steel gates, either in the form of segmental Taintor gates or by "Stoney" sluices. The spillway will contain about 40,000 cubic yards of concrete and 1,250 tons of reinforcing steel.

One of the illustrations shows the excavation of the main canal bed. This excavation is two and one-half miles in length and is 90 feet wide with a maximum depth of fifty feet.

A description of the spillway and of the nature of the river banks at this point was given in the Contract Record of April 19.

The city of Moose Jaw has lost no time in going ahead with its new water supply system, and the firm of Walter J. Francis, consulting engineers, of Montreal, have been engaged by the Moose Jaw authorities to design and supervise the development of the Sandy Creek system. Mr. Frances is at present on the ground and preliminary work has been started. The city expects that the new source of supply will be delivering water to the citizens of Moose Jaw in twelve or fifteen months. This development means the enlargement of Sandy Creek and the laying of a pipe line nearly twelve miles long; it will probably also include a purification system and a pumping plant. The cost of the work may run anywhere from $400,000 upwards. It is quite possible that the Sandy Creek development is only the commencement of a huge system of water supply for a large area in the southern central part of Saskatchewan taking water from the South Saskatchewan River near the head of the Thunder Creek Valley, and supplying Moose Jaw, Regina, Weyburn, and numerous smaller places. This, however, is a project to be worked out in the future. The cost of the South Saskatchewan system will probably exceed $5,000,000. Indeed, the ultimate scheme may involve an expenditure of $20,000,000, when carried out to a conclusion. It is likely that such an undertaking will have to be handled by a specially appointed water commission, composed of representatives of all the municipalities interested, the three great railway companies and the provincial and federal governments.

Large Steel Reservoir at Alexandria

The Alexandria Water Company, Limited, Scotland, has recently completed one of the largest, if not the largest, single-compartment steel reservoir in the world. The internal dimensions of the reservoir are 160 feet in diameter by 25 feet, or 24 feet up to the overflow, giving a useful capacity of 3,080,000 gallons. The following are the thicknesses of plates employed: Bottom plates, ⅞ in. thick; first course, 15/16 in.; second course, 13/16 in.; third course, ⅝ in.; fourth course, ½ in.; fifth course, ⅜ in., and sixth course, 5/16 in. The total weight of the tank, with rivets, is about 388 tons.

The reservoir stands on a series of small brick walls 2 feet thick each, and standing 2 feet apart, so as to leave all the rivets in the bottom plates exposed to view. The whole of the rivetting was done by means of Arrol hydraulic riveting machines, a pressure of 60 tons being employed for the 1-in. rivets and ⅞-in. rivets, the smaller rivets being pressed by smaller machines. The calking was done entirely by hand and by native labor; and on the completion of the work, when the reservoir was filled, there was scarcely any further calking required, the riveted joints being tight.

The work of erection was begun on December 6, 1910, and the water was put in and the reservoir filled on April 11, 1911. The whole of the inside of the reservoir is painted with three coats of bitumastic solution. This new reservoir was made to replace an existing iron reservoir of half the capacity 150 feet in diameter by 15 feet deep, and in order to maintain the town's supply during the four or five months' interval, a stand-pipe was fixed 10 feet in diameter by 25 feet high, and this can always be used in case of repairs, or painting being required to be done to the new reservoir. A light parapet wall has been built all around the reservoir, and the latter has been covered over with galvanized iron sheeting.

The cost of the work, including taking down old reservoir, supply and erection of new reservoir, also alterations to pipe connections and new parapet wall, is about $37,500. The designs for the work were prepared under the supervision of Mr. H. R. C. Blagden, M.I., Mech. E., manager of the Alexandria Water Company, Limited, and the contractors were the Barrowfield Iron Works, Limited, Glasgow.

Industrial Advance in Calgary

In a letter to the Contract Record, Mr. Richard Harrison, Building Inspector for Calgary, states that building operations were somewhat retarded by the shortage of cement during the early part of the summer and that this drawback is still felt in a minor degree. Terrt cotta is being used extensively in Calgary this season, being shipped both from the United States and England, and a good supply of Alberta Clay Products Company's material also being used.

The outlook for the future is very bright, considering that both the Grand Trunk Pacific and the Canadian Northern Railway announce that they intend to have depots in Calgary this year or the earliest part of next yer, and that it is almost certain that the C. P. R. shops will also be located there.

The Alberta Silicated Pressed Brick Company are erecting a plant in Calgary costing in the neighborhood of $60,000. This is the second company in Calgary making this class of brick, the other firm being the Calgary Silicate and Pressed Brick Company. There are nine plants for burnt clay bricks within easy radius of the city, and working at full pressure to meet the demand. There is the Alberta Portland Cement Company, with one plant within the limits of the city, and another a few miles out, both plants having an output of 3,000 barrels per day.

English Road Making

An important piece of road construction has recently been entered upon in the completion of a missing link in the Fosseway, a great highway dating from Roman times and extending from Lyme Regis, in Dorset, through Bath, Cirencester, Leicester, and Newark to Lincoln, a total distance of 215 miles.

In the neighborhood of towns the construction of streets is constantly taking place, but no such length of ordinary rural highway as this missing link in the Fosseway has been constructed in England for the past thirty years. Roads in England are of the most frequent description, and there has been little need for further construction until the advent of self-propelled traffic.

The chief of the ancient roads of England were those originally marked out by the Romans, and generally it can be said they crossed from the south to the east and from the south to the northwest. These are the Fosseway and Watling Street, and crossed in the county of Warwickshire. Generally they have been maintained as highways by the various public authorities through whose areas they happened to pass, but in some isolated districts where the roads have not been necessary or desirable for linking up large towns, portions have never been maintained as ordinary roads, but have been continued as bridle or drift roads without any telfordizing or macadamizing. In England these terms are called, respectively, "foundationing" and "surfacing."

Owing to the advent of self-propelled vehicles every effort is now made in England to render the old direct roads available for the better convenience of through self-propelled traffic.

The high level intercepting sewer for the city of Toronto is nearing completion, and will be in use this fall. The low level sewer is not so far advanced, owing to the inability of the contractors to get a supply of brick, some little time ago. A good supply is being furnished at present, but it is hardly likely that the work will be completed this year.

Lightning Protection

Protection from lightning is a subject that recurs with the coming of each springtime. In the violence of an atmospheric electric disturbance, accompanied by the awe-inspiring flashes of lightning so common with the thunderstorms of the northwest, there are few who have not desired the protection of a lightning-proof shelter. The probability of an individual building being struck by lightning is really very slight, but there is always a possibility of such an occurrence and also that the stroke might be attended with considerable violence, or the building might take fire.

How Lightning Causes Damage

The formation of lightning is very imperfectly understood, but experience with its vagaries and a knowledge of the laws of high-tension electric currents has established a fairly good understanding of the methods of constructing lightning conductors for all ordinary discharges. It is very well known that lightning is the discharge of a large amount of electricity in a very short space of time and that whatever affords it a passage to the earth is likely to be badly damaged, unless the vehicle happens to be a good conductor of electricity and of sufficient size to transmit the amount of electric energy the flash contains; in which case it passes away doing no damage at all.

As a storm develops the electrically charged clouds pass over the earth to break down the resistance of the intervening air, the resulting discharge will pass into the earth by the most convenient path. This is commonly some high object that extends up from the earth. If the object is a conductor of electricity and connected with the earth, the lightning will pass into the ground without the least damage being done, but if it is not a good conductor, the havoc wrought in an instant is sometimes appalling.

Value of Metal Roofed Buildings

Buildings with metallic roofs that are properly connected with the earth are far better protectors from lightning than could be given by rods. Buildings that are completely covered with sheet metal and well connected with the earth are practically lightning proof. Covered in this manner, buildings have been known to be repeatedly struck by lightning without the least damage. The sheet iron granary, so common in the west, when well connected with the earth may be considered lightning proof. The ground connections mentioned above may be made of metallic rods that extend well into the earth and are securely fastened to the metallic covering of the buildings.

In considering the form of lightning conductors it is well to keep in mind the fact that a metal covered building well connected with the earth is practically lightning proof, and that one with a metallic roof, well grounded, is excellently well protected if not perfectly safe. If, then, the roof of a building possesses a metallic ridge, eavestroughs and downspouts, these will afford very good protection if they are well connected and well grounded. A roof covered with a metallic screen, as a chicken screen, makes an excellent protector when properly grounded.

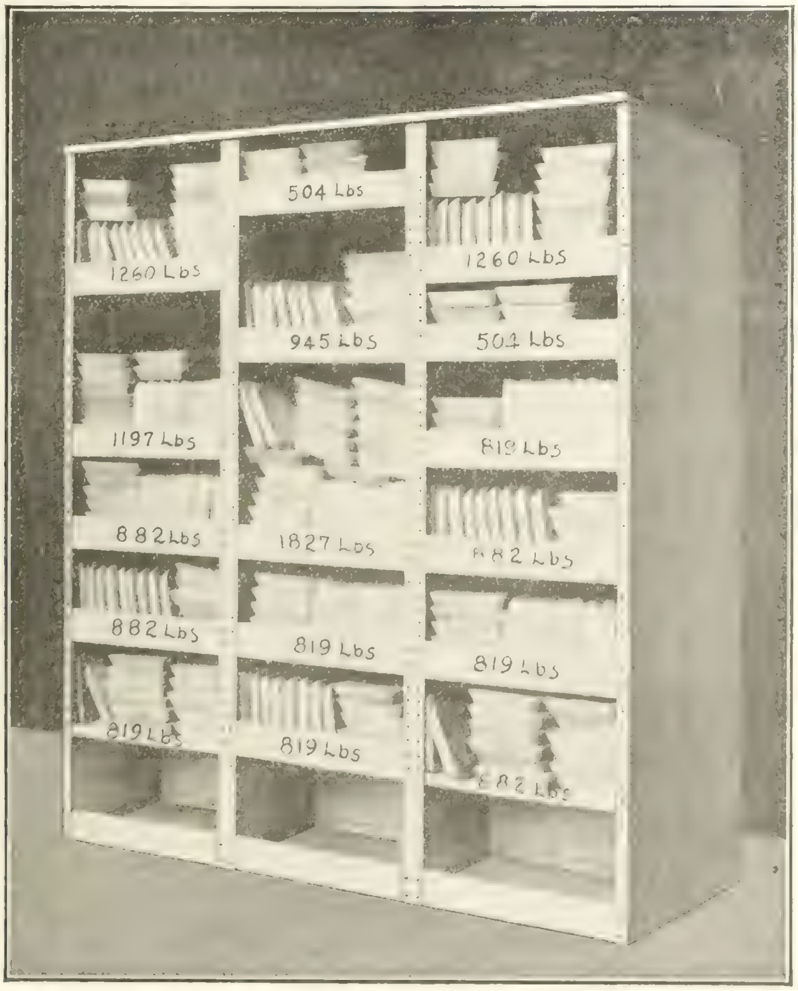
It must be remembered that the ground connection is a positive necessity and too much care cannot be exercised in its construction. The earth is the great reservoir of electrical energy and it is always at zero potential. If a discharge of lightning can be directed into the moist earth by a conductor its energy is soon dissipated, but the ground connection must be of considerable area and extend well into the moist earth. A piece of galvanized iron pipe driven into the ground seven or eight feet makes a good "ground." Large buildings must have two or more such "grounds." The connecting wires must be securely fastened to the ground connections.

Sectional Steel Bins Assembled

Size of Conducting Wires

In the matter of conducting wires, the United States Weather Bureau, in a bulletin on Lightning and Lightning Protection, recommends a No. 3 galvanized iron wire (Brown & Sharpe gauge) as amply sufficient in size for ordinary lightning protection. If metallic downspouts are used as conductors the connections should be made with the "grounds" with riveted joints. Copper conductors give no better protection from lightning than iron if the iron is kept covered to prevent it from rusting.

Wire fences are often the cause of damage by lightning because of the method of construction. If the fence wires are grounded the danger from this cause will disappear. Ground wires may be made of ordinary fence wire and should be connected with each of the wires of the fence and extend into the ground three feet. Such "grounds" should be made for each 100 feet of fence.



Sectional Steel Bin Loaded for Test

How Steel Bins Aid in Fire Protection

By G. P. Blackiston

The matter of fire protection is of the utmost importance in every business, but it is a striking fact that thousands of merchants and manufacturers take no cognizance of the necessity of this protection. They are generally disposed to let well enough alone—inasmuch as they "haven't been burned out yet, so let everything take care of itself as it is."

These are the men who, after the disaster that comes unexpectedly upon them and overwhelm them, ruefully look back upon their old time optimistic complacency and condemn themselves for being too narrowminded to fortify and protect themselves against the fiery foe.

Such examples as these have opened many eyes and to the doctrine of forethought is due much of the success of steel. Business man, heeding the necessity of protection against every untoward contingency, are building bulwarks of steel about them. They have discarded wood, and others are following their example.

So, as the transition progresses, it reaches out into every office, store, factory, warehouse, jobbing house and so on down the list. The cry on every hand is "fireproof—it must be fireproof " Business men demand fireproof buildings because they want their property, their stock, their business thoroughly protected.

An essential in this all-round fireproofing is the discarding of everything that is a fire contributor. One of the latest and newest products of this kind placed on the market for store, factory and warehouse fixtures is the steel bin, manufactured by the Berger Manufacturing Company of Canton, Ohio.

Steel bins are coming into favor for storing small stock of every description in bulk. Hardware dealers and other merchants are using them, while they are being introduced into many factories where it is essential that small parts be kept conveniently at hand. They are constructed of steel, and reinforce the other steel construction of the building, for they do not feed flames but assist in the general plan of protection.

One of the biggest manufacturing companies in the great Pittsburg industrial district not long ago adopted a plan something like this, of having steel compartments in a great room, protected on all sides with steel—like a gigantic vault—for the storage of valuable blue prints.

Brick and Terra-Cotta Columns

Some interesting tests of brick and terra-cotta block columns have been made at the Engineering Experiment Station of the University of Illinois, and appear in the Brickbuilder.

For brick, stone, and terra-cotta masonry structures, designers commonly use stresses which are low in comparison with the strength of the constituent materials. Various reasons exist for this—possible variations in material, chance for poor workmanship, opportunity for settlement and resulting unconsidered stresses, the desire to avoid tensile stresses in masonry, imperfect knowledge of the properties of the completed structure, etc. In some types of structure mass and volume are important considerations, and strength is subordinate. In many applications, however, the strength of the structure is of first importance, and a knowledge of the actual properties of the structure is essential to safe and economical construction. Frequently designers use stresses as high as their information and the usual rules of practice will permit, and make sections as small as these considerations warrant. The utilization of the working capacity of a structure is generally advantageous. This is especially true when the better grades of material are used, and when workmanship is known to be first-class. Much information is available on the strength and other properties of constituent materials like mortar, brick, stone and terra-cotta, but relatively little is known of the properties of built-up structures. Anything that adds to our knowledge of such construction should be helpful, and it was with a view of obtaining further information on the properties of short built-up columns or piers that the tests herein described were undertaken.

Dimensions of the Columns

The work described in this article includes tests of 16 short columns or piers of brick, and 16 columns built of terra-cotta blocks. Although long column action seems not to enter into these compression test pieces, they will be termed columns by analogy to the use of the term column for other compression members of not greater slenderness ratio. The length varied from 10 feet to 12½ feet. In lateral dimensions the brick columns were 12½ by 12½ inches, and in the terra-cotta block columns the range was from 8½ by 8½ inches to 17½ by 17½ inches. The bricks used in the construction of the columns were of two grades—an excellent class of building brick and a soft grade selected as representative of interior bricks. The terra-cotta blocks were of good quality. Different qualities of mortar and different grades of workmanship were used. The loads were applied continuously to failure in most cases, but tests were also made with repeated applications of the same load. Central loading of the column was used in most cases, but in some tests the load was applied eccentrically.

All the tests were made in the 600,000 lb. Riehle vertical screw testing machine in the Laboratory of Applied Mechanics of the University of Illinois. The machine head moved at the rate of 0.05 in. per minute, except in some cases where the load was repeated, when a speed of 0.10 in. per minute was used. The load was generally applied by increments of about 25,000 lb. on the column, but for the columns built of lean mortar or of clay-brick the increment was smaller. The load was applied through a spherical bearing block, except where the column was loaded eccentrically. In arranging the columns for eccentric loading, a half-inch square steel bar, about 20 inches long, was placed 1 inch off the centre of the column under the lower bearing block, and a similar bar in a corresponding position on the top of the upper bearing block. The load was applied to the column through these bars.

In all of the brick column tests the first evidence of distress observed was a faint popping sound, which seemed to proceed from the interior of the columns. As the load was increased, the popping noises were heard more frequently and were louder. As the load was further increased, the action of the columns depended to a great extent on the quality of the mortar used. The columns in which the richer and stronger mortar was used gave little or no additional evidence of distress until a load a little below the maximum was reached, when spalling of the mortar at the corners of the columns, or the formation of longitudinal cracks through the vertical joints, gave warnings of impending failure; after the beginning of spalling or the formation of longitudinal cracks was observed, the failure was generally very sudden and complete. In this class of columns (those with 1:3 Portland cement mortar) the debris showed that failure was precipitated by the formation of longitudinal cracks through each vertical joint. These cracks generally extended throughout about the upper two-thirds of the length of the column, beginning near the middle and extending both ways. Such failures were extremely violent and sometimes involved hazard to observers, and often proved destructive to measuring instruments. The failures came with such slight warning that despite repeated efforts the operator was unable, except in two tests, to stop the movement of the testing machine, after evidences of failure were observed, in time to avoid reducing the upper two-thirds of the column to a mass of broken bricks and mortar scattered over the laboratory. The design of this machine is such that it may be stopped and the motion completely reversed almost instantly. The columns referred to were the ones laid up carelessly. They were less rigid than the others of the same materials, and hence took on load more slowly.

Features of the Tests

The phenomena of the test of the clay-brick columns did not differ greatly from those of shale brick with 1:3 Portland cement mortar, except that on account of the reduced rigidity the load was applied more slowly and the failures were less sudden and violent.

The failures of the columns in which the 1:5 Portland cement, natural cement or lime mortar was used, were similar to those described above, except that they rarely got beyond the spalling and cracking stage. In these tests the formation of the vertical cracks could readily be observed. The freedom from sudden collapse was probably due to the yielding of the joints, and the fact that the testing machine does not follow such yielding instantaneously. It must not be inferred that under an actual load such columns would not have failed as suddenly and completely as the others. Where natural cement or lime mortar was used the mortar gradually disintegrated and reduced to powder.

No direct comparison of the strength of the lime mortar columns with the strength of the mortar can be made (since no test of the lime mortar were made), although it is evident that the low values observed are due to the low crushing strength of the mortar. From the action of these columns during the tests it seems evident that the lime mortar broke down at a load which was proportionately very much lower than that carried by the cement mortar. From the early signs of distress exhibited by these columns it seems doubtful if they would continue to carry a load greater than about one-third the maximum load given in the test, while for the shale brick columns built with Portland cement mortar, the load at which the first signs of distress were observed was from 50 per cent. to 75 per cent. of the maximum load carried.

For the two columns built of underburned clay bricks and 1:3 Portland cement mortar, the average load carried was 1,600 lb. per square inch. The ratio of this load to the load taken by the shale brick columns tested at the same age is 0.32. The ratio of the crushing strength of the clay brick to that of the shale brick is 0.37.

It is evident that the strength of any brick or block structure is influenced greatly by the quality of the mortar used. These comparisons indicate that, for the columns tested, the strength of columns built from the same bricks is closely proportional to the strength of the mortar used in their construction, and the strength of columns built of different bricks using the same mortar is closely proportional to the crushing strength of the bricks.

These tests indicate that the crushing strength of the brick is as important a factor in the strength of a structure of this kind as the quality of the mortar used. The most economical structure would seem to result from using a mortar comparable in strength with the brick. Such considerations are generally unnecessary, except in design of columns, piers, etc., which are to sustain excessive unit loads.

If the load at which the column first shows signs of distress by popping sounds represents the maximum permanent load which the column would carry, then this load is the one on which the factor of safety should be based, and not the load carried momentarily before failure.

The Terra-cotta Columns

The terra-cotta block columns were built and tested in two lots, an interval of about one year separating the times of making the tests. The cement used was the same brand in both years, though the lots were different. The columns were generally made in sets of two, each set being constructed and loaded similarly. The tests resembled those of the brick columns in many respects.

Generally, the terra-cotta block columns gave no signs of distress until a load near the maximum was applied, when cracking noises similar to those described for the brick columns were heard. This was soon followed by the formation of longitudinal cracks through the vertical joints, or the spalling of the horizontal mortar joints at the corners of the columns, either of which was immediately followed by sudden collapse of the column. The failures of these columns were even more violent than those described for the brick columns. The smaller columns showed more variation in the manner of failure than the large ones. The characteristic form of failure for the 12½-in. by 12½-in. columns was a sudden total collapse, immediately following the appearance of longitudinal cracks through the vertical joints near the middle. Failure sometimes occurred with no warning, except the continued shortening of the column under the increasing load.

The columns loaded eccentrically failed by splitting from end to end along the vertical mortar joint which was parallel to and nearer the loading bar.

Both brick columns and terra-cotta block columns gave high strengths in all cases where strong mortar and care in building were used. For central loading, the strength of the brick columns ranged from 3,220 to 4,110 lb. per square inch, and the strength of the terra-cotta block columns from 2,700 to 3,790 lb. per square inch, the columns having the highest resistance not failing at the full capacity of the machine. The effect of the strength of the mortar is apparent in the carrying capacity developed in the columns lower loads were found in columns built with 1:5 Portland cement mortar than in those with 1:3 Portland cement mortar; still lower loads in those with 1:3 natural cement mortar, and still lower loads in those having 1:3 lime mortar. The effect of the quality of the bricks is shown in the columns made with inferior bricks, which carried only 31 per cent. as much as columns built with the better grade of brick. In the case of the terra-cotta columns, the blocks which were culled out as somewhat inferior gave a column strength perhaps 30 per cent. less than the columns built with superior blocks. The effect of the attempt to represent hurried or careless workmanship in two brick columns and in three terra-cotta block columns, was a loss in strength of about 15 and 25 per cent., respectively.

Trade Notes and Items of Interest

Ottawa is contemplating the erection of a high level bridge across the Rideau Canal. The structure will be of reinforced concrete, with six spans, and will be 760 feet in length, including approaches.

As a result of a by-law submitted to the ratepayers, the sewer commission of Berlin has recently been abolished. The city council has appointed a committee of its members to take over the management of the sewerage work.

An indication of the largely increased business being transacted in Calgary is forcibly shown by the civic license department. During 1910 the receipts were $53,000. This amount was equalled for the first five months of 1911, and will reach at least $75,000 before the close of the year.

The city of Brandon has been recommended in an engineer's report to install a sedimentation basin. The form of basin recommended is one consisting of two parts, each with a capacity of 2,340,000 gallons, and to be filled by centrifugal pump. The basin will be of concrete construction.

It is stated that the new floating dock for the city of Montreal, which is being built by Vickers' Sons & Maxim, will be completed at their shipbuilding works at Barrow-in-Furness, England, by the time the navigation season opens next year. The dock will be brought across the Atlantic and installed immediately.

With a total of approximately 1,000 men engaged in civic works, independent of those employed by contracting firms doing city jobs, and a monthly payroll of approximately $66,000, Victoria is making a new record for activity in carrying out works of improvement. The payroll is the largest in the history of the city.

A committee has been appointed for the local park board to look into the general question of oiling and watering the roads through Vancouver's large natural park, Stanley Park, which has many miles of roadways through its scenic extent. This information may be of interest to firms handling oiling and watering apparatus or holding patents for oiling materials.

Herbert B. Rugh, architect, Ninth Floor, Union Bank Building, Winnipeg, has consolidated his business with Ross and MacFarlane, architects, of Montreal, in respect to their western business, under the firm name of Ross & MacFarlane, architects, of Montreal and Winnipeg, retaining Mr. Rugh's present offices. Mr. Rugh will be manager of the western office and have charge of all western work, including, besides his own, the Selkirk Hotel in Winnipeg for the Grand Trunk Railway, and large hotels in Edmonton and Prince Rupert.

We understand that Mr. Leonard Andrews, M.I.C.E., managing director of the Key Engineering Company, London and Manchester, who spent some months in Canada on behalf of his company last year, was so impressed by the possibilities for British products in Canada that he has been commissioned by several of the largest engineering manufacturers in Great Britain, to make a further visit to Canada to ascertain the best means of improving trade relations in engineering appliances between Canada and Great Britain, and that he has now returned to this country for that purpose. He will stay for a short time at the Windsor Hotel, Montreal, before leaving for the west.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is nvited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Assiniboia, Man.

Tenders called for waterworks, Deer Lodge subdivision. Secretary-treasurer, Kirkfield Park, Man; consulting engineer, [illegible] H. K. Rattan, Winnipeg. Construction of sewers and waterworks. Specifications at office of St. James Realty Company, Bank of Nova Scotia Building, Winnipeg. Tenders received until July 31st by secretary-treasurer.

Cardston, Alta.

By-laws carried for gravity water system, $40,000. Owner, Municipality of Cardston. Engineer, R. E. MacArthur, Lethbridge, Alta. System, gravity. N.B.—The by-law to raise $5,000 for completion of pure water system in Wingham, Ont., was also carried.

Chilliwack, B.C.

Under consideration, purchase of machinery. City Engineer, T. B. Croly. The proposition to buy plant superseded by that to purchase material for cement sewer pipe.

N.B.—Victoria, N.B., is also in the market for large quantities of drainage and sewer pipe. By-law for $300,-000 partly appropriated for this.

Collingwood, Ont.

Tenders called for sewers. Town engineer, K. S. Macdonell. Construction of about 700 feet of 10-in. sewers. Tenders received by engineer until noon, August 1st.

Glacier Point, B.C.

Tenders called for concrete tower, etc. Owner, Dept. of Marine and Fisheries, Ottawa; Deputy Minister, A. Johnston. Erection of reinforced tower, dwelling, boat house and oil shed in the Strait of Juan de Fuca. Plans, etc., at Department, Ottawa, at agency of this department, Victoria, and at the post office, Vancouver. Tenders received until August 26th.

Gravenhurst, Ont.

A by-law will be submitted on August 5 for the raising of $3,000 for the construction of cement sidewalks and [illegible]

Halifax, N.S.

Plans in progress for pipe house, $3,-000, Chain Lake. Owner, City of Halifax; engineer, F. W. Doane, 25 Young avenue, Halifax. Two storeys, concrete and granite, concrete and steel roof. Plans to be submitted for approval of city council at next meeting.

Proposed work on sewers, $7,000, Bilby, Young and Gottingen streets. Owner, City of Halifax; engineer, F. W. Doane, 25 Young avenue, Halifax. Construction of 400 feet, Bilby; 800 on Gottingen, 250 on Young street. City Engineer preparing plans to be approved by council next meeting.

Harriston, Ont.

Tenders called for municipal drain, Tp. of Minto; township clerk, W. D. McLellan, Harriston, Ont. Construction of municipal drain; estimated amount of excavation, 21,600 cubic yds. Specifications at office of clerk. Tenders received by clerk until August 7th.

Moose Jaw, Sask.

Tenders called for sewer and water extensions. Owner, City of Moose Jaw; clerk, W. F. Heal; city engineer, J. M. Wilson. Laying of approximately 16,-885 lin. ft. of sewer and water extensions and supply of all cast iron, vitrified tile, pipe and specials, etc. Plans, specifications, etc., with engineer. Tenders received until 8 p.m., August 14, by city clerk.

New Westminster, B.C.

The tender of the Dominion Glazed Pipe Cement Co., of Vancouver, for sewer pipe for the west end has been recommended for acceptance.

N. Buxton, Ont.

Tenders called for grading, Townline road, between Tp. of Raleigh and Tilbury E. Earth must be removed to easterly side of road so that when completed it makes a level top width of not less than 20 feet. Tenders received until noon July 29th, by R. Clark, North Buxton.

Ottawa, Ont.

Equipment to be installed, waterworks. Owner, City of Ottawa; city engineer, N. J. Ker, Ottawa. Booster pumps to increase water pressure (700 h.p.), electric motors and two turbine pumps. By-laws for this to be submitted to electors in September.

Port Arthur, Ont.

Specifications prepared for waterworks. City engineer, L. Jones, Port Arthur. New force main, 2 miles, cast iron, new stand pipe, ($40,000), 50 diam., 100 feet high. Tenders not yet called for.

Red Deer, Alta.

$54,000 will be expended on waterworks and sewers.

Regina, Sask.

Tenders called for waterworks. Owner, City of Regina, Sask.; city engineer, L. A. Thornton. (a) Trenching, laying and backfilling for about 11,200 lin. ft. 18-in. steel pipe and 1,000 lin. ft. 16-in. c.i. pipe; (b) Construction of a 225;-000 gal. concrete pump well. Particulars to be had on application to city engineer. Tenders received by city commissioners until noon, August 4th. Advertisement in "Tenders and For Sale Department" of this issue.

Revelstoke, B.C.

Tenders called for pipe line, $12,000. Owner, City of Revelstoke; city clerk, Bruce A. Lawson; engineers, Smith, Kerry & Chace, Toronto. Material and construction of a 6-foot pipe line at power works. Plans, etc., at office of city clerk. Tenders received by clerk until August 1st.

Southampton, Ont.

Tenders called for waterworks. Owner, Town of Southampton; town clerk, J. C. Eckford. Construction of intake pipe and filter basin. Plans, etc., at office of town clerk and at office of engineers, Bowman & Connor, 36 Toronto street, Toronto. Tenders closed July 27th.

Toronto, Ont.

Proceeding of board of control, intake pipe, $259,900. City clerk, W. A. Littlejohn; city engineer, C. H. Rust. Board recommended acceptance of tender from Roger Miller & Son, $259,900. Other tenders, Capt. Leslie, cost plus 20 per cent.; Cummings & Robertson, cost plus 20 per cent.; Capt. Midford, cost plus 20 per cent.; Cummings & Roberson also ocered to fix a maximum cost of $225,000, including their commission.

Vancouver, B.C.

The following tenders have been received for paving: Messrs. Thompson & Stewart, grading of Queensbury avenue from Third street to the city limits, $14,760; A. R. Gibson, of Lonsdale avenue, from the wharf to Keith road, $11,160.40; two bids for laying the sewer east and west of Lonsdale avenue, as follows: R. E. Lee, west side, $10,-945; east side, $13,410; Romano, Pinto & Co., east side $13,000; west side $12,-000.

Wetaskiwin, Alta.

Equipment required for sewage disposal works, $6,000. Owner, Corporation of Wetaskiwin; city engineer, W. L. Crane. One-storey concrete foundation, concrete and frame covering. Automatic valves required.

Equipment required, engineering. Owner, Corporation of Wetaskiwin; engineer in charge, G. R. Taylor. Waterworks; one steam pump, one steam compressor. Estimated cost, $10,000; also one vaporization gas engine. Date of calling for tenders not set yet. Extensions to poles and lines are also planned.

Whitewood, Sask.

Cement sidewalks and crossing. Owner, Corporation of Whitewood, Sask; secretary, C. S. Barber, Whitewood; contractor, H. M. Keeley, Brandon. Construction of 33,000 feet of cement sidewalks and crossings, 18 cents per square foot.

Wilkie, Sask.

Tenders called for machinery, materials, etc. Owner, Town of Wilkie; T. A. Dinsley, sec.-treas.; engineers, McArthur & Murphy, Bottomly Block, Saskatoon. (A) Electrical machinery; (1) One 60 k.w., 3-phase, 60 cycle, 2,200 volt a.c. generator; one exciter for above; one marble switchboard, instruments and switches; three 2200 volt motors back geared to pumps; five ransformers for lighting system; series Tungsten street lighting system; about 25 cwt. of copper wire (line material, etc.), cedar poles. (B) One 100 h.p. internal combination engine. (C) Pumping machinery; one working head and deep well cylinder; one 250,000 gallon pump; one air compressor, necessary shaftings and belting. (D) One pneumatic storage tank. (E) About 1100 ft. in. c.i. water pipe; 4,800 ft. 6 in. c.i. water pipe; 2,000 ft. 4 in. c.i. water pipe; 15 hydrants and 22 valves. (F) Trenching, laying c.i. water pipes, hydrants, etc. (G) Erection of power house and construction of reservoir. Plans, etc., at office of secretary-treasurer, or on application to Engineers. Tenders received by secretary-treasurer until Aug. 21.

Windsor, Ont.

Tenders to be called for sewer outlet, $8,000. Owner, City of Windsor; city engineer, M. E. Brian. Reinforced concrete outlet under Grand Trunk at Parent avenue. Tenders to be called shortly.

Winnipeg, Man.

Proposed work on sewers and paving. Owner, City of Winnipeg; secretary board of control, M. Peterson. Sewers, John, Helen and Ainsley sts.; asphalt No. 2, Selkirk; asphalt No. 1, McPhillips; granolithic walks, north side of McMillan, Princess, Clark and three other streets. The above is on the order books to be completed this year.

CONTRACTS AWARDED

Port Arthur, Ont.

The contract has been awarded to the Warren Bitulithic Paving Co., of Toronto, for 700 feet of paving and 2,200 feet of curb.

Thorold, Ont.

Paving. Owner, Corporation of Thorold; clerk, D. J. C. Munro, Thorold; engineer, J. C. Gardner, Niagara Falls, Ont. 5,000 lin. feet of 16-ft. macadam road. Successful contractor, D. Walker, Thorold, 57 cents yard; others tendered up to 70 cents.

Railroads, Bridges and Wharves

Brockville, Ont.

Tenders called for extension to tunnel, Bay Rock. Owner, Department of Public Works, Ottawa; C. Desrochers, secretary. Chief engineer, J. G. Sing, Confederation Life Bldg., Toronto. Plans, specifications, etc., at Dept. of Public Works, Ottawa, at the office of the engineer, and with the postmaster at Brockville. Tenders received by secretary until 4 p.m., August 21.

Chapeau, Que.

Tenders called for steel bridge. Owner, Dept. of Public Works, Ottawa; secretary, R. C. Desrochers. Plans, specifications, etc., at Dept. of Public Works, Ottawa, and at the office of J. G. Sing, district engineer, Toronto. J. L. Michaud, district engineer, Merchants Bank Building, Montreal, and with the postmaster at Pembroke, Ont. Tenders received by the secretary until 4 p.m., August 8.

Edmonton, Alta.

John Walters, lumber dealer, of Strathcona, has purchased Big Island from the Dominion Government and will convert it into a summer resort. A large pier will be built at the island this summer.

Guelph, Ont.

Tenders called for bridge, over C.P.R. and River Speed. Owner, City of Guelph; T. J. Moore, County Clerk; acting engineer, L. Malcolm. Construction of reinforced concrete arch bridge and viaduct. Approximate amount of concrete is 251 yards. Marked cheque of $400 to accompany each tender. Plans, etc., at office of Contract Record, 220 King street west, Toronto. Plans, etc., obtained on receipt of $5 to be refunded on return of plans. Tenders received until August 5th by city clerk Advertisement in "Tenders and For Sale Department" of this issue.

Halifax, N.S.

Extension of time for pier and sheds, deep water terminals, I.C.R. Owner, Dept. of Railways and Canals, Ottawa; secretary, L. K. Jones, Ottawa. Construction of reinforced cement; concrete pier and sheds at the Deep Water Terminus, Intercolonial Railway. Plans, etc., at office of chief engineer, Department of Railways and Canals; office of the chief engineer, I. C. R., Moncton, N.B.; consulting engineer, J. Kennedy, Montreal. The time for receiving tenders has been extended from 31st July to noon of August 10.

North Vancouver, B.C.

Re-construction contemplated of shipyard. Owner, Wallace Shipyards, Ltd. Plant destroyed by fire on 11th inst. President Wallace has returned and is looking for a site on the North Arm for erection of new buildings.

Ottawa, Ont.

Electric railway from Smith's Falls to Kingston is being promoted. Engineers wil have ground early in August. Line to follow Rideau Railway and Canal.

The Morrisburg & Ottawa Electric Railway construction will probably commence this fall. Almost direct line from Ottawa to Morrisburg with only one bridge.

Contemplated, bridge, $130,000, across Rideau canal high level. Owner, City of Ottawa; city engineer, N. J. Ker. Reinforced concrete bridge, 6 spans, with approaches 760 ft. length; without approaches, 346 ft., iron railings. By-law to be voted o nin September.

Palgrave, Ont.

Tenders called for steel bridge, over the Humber River on the 7th line. Owner, Tp. of Albion. County Engineer, C. R. Wheelock, Orangeville, Ont., 40 ft. span. Specifications, etc., with engineer. Tenders received by engineer until August 7.

Port Arthur, Ont.

Plans prepared for bridge, Current River. Owner, City of Port Arthur; engineer, L. Jones, Port Arthur. One span, open spandrell, reinforced arch, ribbed walls, 130 feet. Tenders not yet called for.

Railroad to Sellwood Jct. Owner, Canadian Northern Railway; engineer, Wicksteed, Port Arthur; general contractor, Foley Bros. & Larson; subcontractors, 50 miles, Port Arthur east, T. P. Walsh, Minneapolis, Minn. 100 miles, Nepigon Construction Co., Nepigon, Ont. This division is 50 miles east of Port Arthur.

Princeton, B.C.

The Great Northern Railway has commenced laying steel from Princeton to Coalmount. Engineer in charge, L. M. Hale, Princeton.

Quebec, Que.

Plans approved for station, $850,000. Owner, Grand Trunk Pacific; architects, Marchand & Tanquay, Quebec. Part 4 storeys, granite, iron and marble cut stone, structural iron, ornamental iron, terra cotta, steel beams, steam heating, electric lighting, iron and glass roof, sheet metal work, freight and passenger elevators, telephone system, plate glass. Tenders called shortly. Foundation will be extra work.

Souris, Man.

Tenders called for station. Owner, Canadian Pacific Railway. Brick and stone, cement work, pitch roof, electrical work. Plans, etc., with superintendents at Brandon, Souris and with divisional engineer, Winnipeg. Tenders received until August 2nd.

St. John, N.B.

Tenders will be called shortly for the construction of 1,900 feet of sea wall and wharf at West St. John.

Tenders called for car barn, Wentworth street. Owner, St. John Railway Co., Dock street; general manager, H. M. Hopper. Brick and steel. Tenders addressed to H. M. Hopper received until July 31st.

Trail, B.C.

Tenders to be called for bridge, $150,000. Owners, Dept. of Public Works, Victoria, B.C.; engineer in charge, Waddell & Harrington, 1012 Baltimore ave., Kansas City, Mo.; J. E. Griffiths, Public Works Engineer, Victoria. New bridge across Columbia at Trail. Four through-truss riveted spans, each 170 feet long, and 8 feet roadway and steel cylinder piers.

Tenders called for bridge over Columbia river. Owner, Department of Public Works, Victoria; Public Works Engineer, J. E. Griffith. (1) Substructure and erection of superstructure; (2) manufacture and delivery of steel superstructures, metal, bridge. Plans, etc., at government offices, Rossland, Nelson and New Westminster; road superintendent, E. McBride, Granville street, Vancouver, and at the department. Separate tenders on above received by Minister of Public Works, Victoria, until August 31st.

Truro, N.S.

Tenders called for I. C. R. station and freight sheds, Inglis street. Owner, Dept. of Railways, Ottawa. Deputy Minister, A. W. Campbell. Part 2 storeys, 296 feet long; freight sheds, Brunswick and Yonge street, 700 feet in length. Estimated cost, $500,000. Tenders are called until August 1st.

Vancouver, B.C.

The Great Northern Railway will construct a pier 800 feet long on waterfront property in Vancouver.

The contract for the construction of a 250 ft. wharf for the Segur Oil Company, 319 Pender St. W., has been awarded to Hind Bros., wharfage contractors, foot of Gore Street.

Victoria, B.C.

Tenders called for sea wall. Owner, Board of Works, Victoria; engineer, C. B. Case. Construction of sea wall. Al[illegible] tenders and [illegible] will be accepted. Tenders received until August 2.

Winnipeg, Man.

Application to be made for bridge, across Assiniboine at Osborne street. Solicitor, T. A. Hunt, Winnipeg. Plans for proposed new bridge, etc., deposited with Minister of Public Works and Registrar, Winnipeg, June [illegible]. Application for approval of plans to be made one month from date of deposit.

CONTRACTS AWARDED

Chilliwack, B.C.

Work in progress for bridge, $1,035. Owner, Corporation of Chilliwack. The contract for the bridge over Hope river has been awarded to Messrs. Nichol and Stringer for $1,035. It is to be a wooden bridge. Work has been started. The city has decided to build another bridge. City engineer instructed to draw plans.

Drayton, Ont.

Bridges. Owner, Wellington County, Ont.; warden, M. Fox, Drayton; engineers, Bowman & Connor, 36 Toronto street, Toronto; successful contractor, Chas. Matteni, Fergus, Ont., $4,350. The following tendered: W. White & Son, Toronto, $5,395; E. C. Lewis, Toronto, $7,285; H. Croff, Quelph, $5,316; John Murray, Toronto, $5,400; about 767 cubic yards in all.

Halifax, N.S.

The contract for a $75,000 mill at Millview, Halifax, being erected by W. A. Moir & Co., Argyle St., Halifax, has been awarded to W. A. Ronnan & Co., Halifax.

Heathcote, Ont.

The contract for the concrete bridge to be erected at Heathcote has been awarded to A. Cooper & Bros., Collingwood, $1,125.

Kamloops, B.C.

The municipality of Kamloops will spend $200,000 in developing a power plant at Barrier River.

Port Arthur, Ont.

Breakwater, Bare Point, Rainy River District. Owner, Department of Public Works, Ottawa; engineer, E. B. Temple, Port Arthur; general contractor, Thunder Bay Construction Co., Port Arthur.

Sault Ste. Marie, Ont.

Railway. Owner, Algoma Central Railway; chief engineer, R. S. McCormick, Algoma Central Railway, Sault Ste. Marie. General contractor, Kennedy & McArthur (Superior Construction Co.) From Hobon on C. P. R. N. to the National Transcontinental Railway, 142 miles west of Cochrane, a distance of 101 miles. Work includes construction work to sub-grade and in addition track laying and ballasting.

Taft, B.C.

Railway station, $3,000. Architect, M. K. McQuarrie, Revelstoke; general contractor, G. D. Shaw, Revelstoke, $2,900; McCarthy bid, $3,100. No subcontractors on this project.

Vancouver, B.C.

The contract for the railway from Bull Creek to the summit of the West Fork of the Kettle River, has been awarded to L. M. Rice & Co., Fairfield Building, Vancouver.

Public Buildings, Churches, Schools, etc.

Arcola, Sask.

Tenders called for school. Owner, Public School Board; secretary, J. R. Donaldson. Erection of addition to school building. Tenders received until August 1st.

Brandon, Man.

Equipment required for fire hall appliances. City engineer, R. E. Speakman, Brandon. On recommendation of city electric inspector Small, city decided on 18th inst. to purchase following through Northern Electric Co.: 1 storage battery, switchboard of 4 circuits, 1 automatic repeater for 4 circuits, 1 motor generator set for charging storage battery, 1 automatic lighting switch, 1 punch register, date and time stamp, 1 take-up reel, electric stall door locks.

Chatham, Ont.

Tenders to be called for billiard hall and bowling alley, $8,000, King street. Owner, Wm. Baby, Sr., Chatham; architect, J. L. Wilson & Son, Chatham. Two storeys and basement, 26 x 140, concrete, brick and frame, concrete foundation, steam heating, electric lighting, composition roofing, interior finish plaster and wood, cement, cut stone, brick, terra cotta, tile, artificial stone, metallic lath, structural and ornamental iron, fire escapes, sheet metal work, cornice, pipe covering, electrical work, steel beams, plastic relief work, plate art and prismatic glass. Tenders received after July 31st, close August 12th.

Denman Island, B.C.

Tenders called for school. Owner, Department of Public Works, Victoria, B.C.; architect, J. E. Griffith, Victoria, B.C. Plans, specifications, etc., at office of the Government Agent, Cumberland, B.C.; Geo. Dalziel, secretary school board, Denman Island, and at the Department of Public Works, Victoria, B.C. Accepted cheque for $200 to accompany each tender. Tenders close at noon, August 10.

Forest, Ont.

Plans being prepared for library, $5,000. Owner, Free Library Board; architect, W. A. Mahoney, Guelph, Ont. Two storeys, 34 x 34, brick, stone foundation, cut stone, hot water heating, electric lighting, slate roof, interior finish, Georgia pine, plate and art glass. Tenders will be called in about two weeks.

Kingston, Ont.

The Salvation Army are to have a new barracks on Princess St., near Calgary Street.

Lethbridge, Alta.

Plans are being prepared for a Detention Home for children to be erected in the west end of the city on First street south.

London, Ont.

Tenders called for school house, Reserve of the Chippewas. Owner, Department of Indian Affairs, Ottawa; assistant deputy, T. D. McLean, Ottawa. Erection of frame school. Plans, etc., at office of S. Sutherland, Indian agent, Delaware, and at the post offices, London and Strathroy. Tenders called until noon, August 7th, by J. D. McLean.

MacLeod, Alta.

Plans are being prepared by the Dominion Public Works, for a new post office building.

New Westminster, B.C.

Tenders to be called for two schools, $45,000, Sapperton and North road. Owner, New Westminster School Trustees; architect, Gardiner & Mercer, New Westminster. Three storeys, frame, stone foundation, shingle roof, interior finish fir. Tenders received after August 11; contract probably let about August 20.

New Westminster, B.C.

The Sisters of St. Mary's Hospital are contemplating the addition of a $20,000 wing.

Ottawa, Ont.

Tenders called for hospital. Owner, Lady Grey Hospital; architect, A. Le B. Weeks, Canada Life Bldg., Ottawa. Fire escapes. Tenders received until July 29th.

Port Arthur, Ont.

Plans prepared for Sailors' Institute. Architect, F. Urry, Port Arthur, and Head of Institute, Peter McCrae. Building to be three storeys.

Port Arthur, Ont.

Work delayed, building and engineering. Finnish Co. Operative Trading Co., no further move made; nothing likely to be done this year. Riley, Ramsey Co., Ltd., not likely to build. Decision influenced by action of New Storage Co. Repairs and additions to municipal building held over. Engineering, Pavements on Pearl, Cameron, and Algoma streets, will not be gone on with this year.

Prince Albert, Alta.

Plans out for an eight-room school to be erected this summer and a by-law for two more will be voted on.

Prince Rupert, B.C.

Work in progress for theatre block, $30,000, Second avenue. Owner, Westholme Lumber Co., First avenue, Prince Rupert; architect, W. L. Barker, Third avenue, Prince Rupert. Two storeys, 100 x 100, frame, concrete foundation, cement work, fireproofing, fire escapes, felt and gravel roof, metal ceiling, asbestos materials, electrical work, plate and art glass. Westholme Co. will build. Extensive marble and electrical work required.

Regina, Sask.

Clemesha & Coltman, architects, will complete plans for the new St. Andrews Church in Moose Jaw, to cost $100,000.

Regina, Sask.

Sale reported, site for plant, Scarth and Twelfth avenues. Owner, J. H. Ashdown, Hardware Co., Bannatyne E., Winnipeg, 75 x 125 feet, site of Assiniboia club house. Plans for new club house being revised by Darling & Pearson, architects, Winnipeg.

Saskatoon, Sask.

Plans accepted for Y. M. C. A. building, $36,000, 24th street. Owner, Y. M. C. A.; secretary, Miss S. Little, Toronto; architect, Thompson, Daniel & Colhurst. Three storeys and basement, reinforced concrete construction, ornamental iron, brick with terra cotta. Excavation to commence at once.

St. John, N. B.

Tenders called for three-storey block. Owner, Right Rev. Bishop Casey, Roman Catholic Bishop of St. John; architect, F. Neil Bridie, St. John. Tenders closed July 28.

Toronto, Ont.

Tenders to be called for church and sunday school, $60,000, corner of College and Montrose. Owner, West Presbyterian Church, Toronto; architects, Gordon & Helliwell, Confederation Life Building, Toronto. Various trades required. Tenders called during the next week.

Work in progress for synagogue, $10,000. Shipman and Maria. Owner, Congregation of Israel, Shipman and Maria, Toronto; architects, Ellis & Connery, Manning Chambers, Toronto; general contractor, H. Greenblatt, 1 Bolar st., Toronto. One storey, brick, stone foundation, electric lighting, open plumbing, slate roofing, cut stone, brick, cornice, electrical work.

Tenders called for police station, Claremont street. Owner, City of Toronto, G. R. Geary, chairman board of control. Masonry, carpentry, galvanized iron and roofing, gas fitting and plumbing, hot water heating, electric wiring and light fixtures, plastering, painting and glazing, tiling. Plans with city architect. Tenders received by G. R. Geary until noon, August 1st.

Tenders called for addition to schools. Owner, Separate School Board, Toronto; architect, Chas. Read, Confederation Life Building, Toronto. Two-storey additions to Holy Family School, Close avenue, and St. Anthony's School, Gladstone avenue, bric, stone foundation, steam heating, open plumbing, felt and gravel roofing, cement work, cut stone, brick, fireproofing, structural iron, sheet metal work, cornice, roofing, steel beams. Tenders closed July 31.

Victoria, B.C.

It is proposed to erect a new high school opposite Camosun street, the rear of the building being near Vining street.

Tenders received for building. Owner, Union Club, Victoria; architect, L. R. Rixford, Victoria. Reinforced concrete. Tenders received after July 25th.

Messrs. Murray & McKinney, contractors, will erect a new block to the University School to be used as class rooms, The new building will be brick with necessary heating plant and all modern appliances. .

Tenders to be called for extension of public buildings, Parliament Square. Owner, Department of Public Works, Victoria; architect, F. M. Rattenbury, Victoria. Two wings, 3-storeys, granite, fireproof. Total cost, including library block, which will be central, $750,000. Tenders to be called soon.

Welland, Ont.

Contemplated, Church. Owner, Holy Trinity Church; building committee, J. R. McCollum, Wardens Cox and Boyle. Plan the erection of a new church to cost $15,000

Wetaskiwin, Alta.

Equipment required for additions to fire hall, MacDonald street. Owner, Corporation of Wetaskiwin; architect, J. H. Knight, Wetaskiwin; fire chief, H. Whitehead. Two-storey frame and metal structure, tin roof. Required, 100 ft. new cotton rubber lined hose, two sets fire dept. drop harness, hydrant shut off [illegible] and [illegible] nozzles, new hose wagon (team drawn).

Windsor, Ont.

Plans prepared for Fair buildings,$10,000. [illegible] Agricultural Society, H. J. McKay, Windsor, secretary; architects, Jacques & Williamson, Windsor. Four buildings, each 34 x 60, wood and glass, concrete floors. Two of the buildings to be erected this year in time for the fall fair.

Winnipeg, Man.

A 2-storey municipal hall will be erected at St. James, brick veneer, stone foundation, $8,000.

Wynyard, Sask.

Tenders called for school. Owner, Public School Board, Wynyard; secretary, R. Denovan; architect, W. W. La Chance, Saskatoon, Sask. Erection of school. Plans, etc., at office of Waldon Heating Co., 92 Princess street, Winnipeg, and with t ehsecretary. Tenders received until August 5th by secretary.

CONTRACTS AWARDED

Fort William, Ont.

Y. M. C. A. Building. Owner, Y. M. C. A., Fort William; architect, R. E. Mason, Fort William; general contractor, M. H. Braden, Fort William, $76,702; heating, Northern Engineering Co.; plumbing, Anderson & Co., both of Fort William. Four storeys, solid brick, 100 x 100, cement foundation, cut stone, structural iron, fire escapes, fireproof doors, eelctrical work, steel beams, iron columns. Work will commence immediately.

Montreal, Que.

The contract has been awarded to John Wighton, 16 Sussex street, for an $8,500 club house to be erected by the Montreal Racquet Club on Concord street, 3 storeys, brick and roughcast, 23 x 100. H. C. Stone, architect.

The contract has been awarded for a $2,800 church for the Presbyterian Diocese of Montreal, on Hamilton avenue, to A. Lacroix, 25 Stanley avenue, St. Lambert.

Medicine Hat, Alta.

School. Owner, Public School Board. Architect, W. T. Williams; contractor, A. P. Burns, Medicine Hat, $69,550. Two storeys, brick and cut stone, 65 x 130. Board is appropriating $8,550 for furnishing of school, consisting of blackboards, etc. Building to be completed January 1

Newdale, Man.

School, $12,000. Owner, Municipality of Newdale; architect, W. A. Elliot, Brandon, Man.; general contractor, R. Willoughby, Brandon. One storey, brick and stone, 64 x 36, Muller hot air heating, pitch roof. Sub-contracts not let yet.

Preston. Ont.

The contract for the Roman Catholic Church on Duke street, awarded as follows: Messrs. Wirsching Bros., mason and stone; Messrs. Reizel Bros., of Berlin, carpenters. Heating and plumbing not yet awarded. Mr. Holmes, architect.

Swift Current, Sask.

Hospital [illegible] Darrach, Regina and Swift Current; general contractor, Bernard, Regina. Heating contract not let yet.

Vancouver, B.C.

Rink. Owner, Patrick Bros (Denman and Georgia); general contractor, W. G. [illegible] No. 1 common brick and some pressed brick, 7,250 yards of plaster, 1,200 bbls. of lime, steel posts and girders, felt roofing, sheet metal work, ornamental fire escapes, and plumbing. Tenders on above closed July 24th. Further time allowed on plumbing and wiring.

Herrett & Co., contractors for the schools at Cluff avenue and Rosenberg road and 43rd and Ontario, are ready for sub-tenders on the following lines: Mill work, plumbing, plastering, painting, brick work, roofing and heating. Excavation awarded about Tuesday, July 18.

Victoria, B.C.

The Canadian Wire Goods Mfg. Co., Hamilton, have been awarded the contract for installation of automatically releasing emergency system of opening doors for the provincial jail. Recommendation of steel stairways to replace wooden ones has not yet been acted upon.

Winnipeg, Man.

General Hospital. Successful contractor, Carter Halls Aldinger Co., Winnipeg, $287,000. Other tenderers were: C. W. Sharp & Son, $312,806; Kelly Simpson Construction Co., $290,213; Lyall Mitchell Co., $277,204; Wallace & Atkin, $272,767; Claydon Bros., $272,577.

Residences

Brockville, Ont.

Tenders to be called for alterations to residence. Owner, M. M. Brown; architect, A. Stuart Allaster, Brockville. Two and one-half storeys, hot water heating, electric lighting, interior finish graining, sheet metal work, pipe covering, electric work, art glass. New heating and lighting system required. Tenders received after August 1st.

Hamilton, Ont.

Plans being prepared for ten houses, Huron street; architect, Stewart McPhie, Bank of Hamilton Chambers, Hamilton. Two storeys, 20 x 28 each, brick and stone, stone foundation, hot air heating, gas and electric lighting, shingle roof. Estimated cost of each, $1,400

Montreal, Que.

Private garages being erected by the following: R. H. MacDonald, Cote Rd., Westmount, $275; J. O. E. Blackwell, Roslyn avenue, Westmount, $300; Hiram L. Piper, Arlington street, Westmount, $600; A. G. Beyers, Belmont street, Westmount, $500; J. H. Hand, Belmont street, Westmount, $400; W. H. Creed, 630 Roslyn avenue, Westmount, $1,000. The following buildings are in the course of construction in Westmount: M. A. A. A., 250 Peel street, is building a large club house, $75,000, reinforced concrete, contractors, Atlas Construction Co.; the Steeling Press, Ltd., St. concrete and brick, $9,000; W. K. Grafftey, Elm avenue, residence, stone and brick, Sydenham avenue, $11,000; W. J. Munroe, 332 Grosvenor avenue, residence, concrete, stone and brick, $12,000. Mr. Gouin, Bellevue street, Westmount, residence, $4,000; Mr. Williams, 494 Elm avenue, residence, stone and brick, Mount Pleasant avenue, $5,500; Mr. G. H. Hand, Lansdown street, residence, $18,000.

Montreal, Que.

[illegible]

storeys, [illegible] x [illegible] brick, stone foundation.

Port Arthur, Ont.

Work in progress for residence, $10,000, Dawson road. Owner, F. S. Wiley, Port Arthur; general contractor, R. Hamer, Port Arthur. Two and one-half storeys, 48 x 108, cut and sawn stone, brick and concrete. Foundation laid in [illegible] stone for construction is now being prepared. As far as can be learned no sub-contracts have been let. Building not to be finished this year.

Toronto, Ont.

Tenders called for residence, $10,000, Russel Hill road. Owner, J. G. Hay, Toronto; architect, Chadwick & Beckett, Toronto street, Toronto. Two and one-half storeys, 44 x 35, brick and stone, stone foundation, hot water heating, electric lighting open plumbing, shingle roofing, interior finish red oak, cement work, cut stone, brick, tile, mantels, artificial stone, cronice, electrical work, plate and art glass. Tenders close August 3.

Work in progress for two pair dwellings, $8,000, Pape avenue. Owner, Hayes & Caldwell, 101 Victoria street, Toronto. Two and one-half storeys, 30 x 38, brick, brick foundation, hot air heating, electric lighting, open plumbing, shingle roofing. Owner will build by day labor.

Tenders to be called for detached house, $3,500, south side Walker avenue. Owner, H. B. Reeson, 14 Summerhill ave., Toronto; architect, J. Hunt Stanford, 34 Yonge street Arcade. Two and one-half storeys, 23 x 36, brick, stone foundation, hot water heating, combination lighting, open plumbing, shingle roofing, cement work, cut stone, brick, electrical work, plate and art glass, etc. Tenders received after July 26, close August 5.

Work in progress for pair buildings, $5,400, west side Denison avenue. Owner, C. Laurie, 105 Denison avenue, Toronto. Two and one-half storeys, 30 x 42, brick, stone foundation, hot air heating, electric lighting, open plumbing, slate, felt and gravel roofing, cement work, brick, tile, mantels, cornice, electrical work, electric bells. Owner will build by day labor.

Tenders to be called for residence, $7,000, Wychwood Park. Owner, Mrs. A. K. Goodman, Wychwood Park, Toronto. Two storeys, 54 x 32, brick, stone foundation, hot water heating, electric lighting, slate roofing, hardwood floors, cement work, cut stone, brick, terra cotta, tile, mantels, metallic lath, electrical work, plate glass. Tenders received by J. E. Johnson, 314 Grace street, Toronto, after August 1st.

Tenders called for two pair dwellings, $10,000, Cawton avenue. Owner, J. J. McKinney, 87 Beatrice street, Toronto; architect, Wm. Ainlay, 149 Beatrice st., Toronto. Two and one-half storeys, 42 x 30, brick, stone foundation, hot air heating, electric lighting, open plumbing, shingle roofing, cement work, brick, tile, mantels, electrical work, electric bells, plate glass. Tenders called on all work but masonry and carpentry.

Tenders called for residence, $4,000, Brunswick avenue. Owner, Dr. Slade, Toronto; architect, H. Bryan Gilbert, 47 Wellington street, Toronto. Two and one-half storeys, brick, brick foundation, hot water heating, gas and electric lighting, slate roof. Hardwood interior finish, mantels, plate glass. Tenders called by architect for all trades until July 28.

Toronto, Ont.

Work in progress for private dwelling, $4,500, south side Westminster ave. Owner, R. E. McDonagh, 253 Spadina avenue, Toronto. Two and one-half storeys, 16 ft. 6 in. x 44, brick and stone, stone foundation, hot air heating, electric lighting, open plumbing, slate roofing. Owner will build by day labor.

Work in progress for dwelling, $3,500, 150 Westminster avenue. Owner, E. P. Atkinson, 100 Roncesvalles avenue, Toronto. Two and one-half storeys, 33 x 21, brick and stone, stone foundation, electric lighting, shingle roofing, interior finish hardwood, cement, cut stone, brick, plate glass, etc. Owner will build by day labor.

Wm. Whitelaw, 51 Ruskin Ave., $3,500 residence at 85 McVetty Ave., 2½ storeys, 22 x 34, brick and stone, stone foundation, shingle roofing.

J. Thompson, 165 Prescott Ave., pair dwellings west side Perth Ave., $4,000, 2 storeys, 36 x 29, brick and stone, stone foundation, shingle, felt and gravel roofing.

Mrs. E. Garton, 163 Macdonnell Ave., dwelling, $3,000, 92 Geoffrey St., Toronto, 2 storeys, 16 x 38, brick and stone, stone foundation, shingle roofing, cement work, cut stone, brick, tile, mantels, plate glass.

J. Jennings, 99 Ritchie Ave., pair dwellings, $5,000, east side Ritchie Ave., 2 storeys, 37 x 34½, brick and stone, stone foundation, shingle, felt and gravel roofing.

J. H. Robinson, 109 St. John's Rd., dwelling, $2,500, Evelyn Ave., 2½ storeys, 22 x 30, brick, stone foundation, hot air heating, electric lighting, shingle roofing.

Vancouver, B.C.

Tenders to be called for apartment house, $6,000, Keefer street. Owner, Mrs. Snyder, Vancouver; architects, Campbell & Dawson, Exchange Building, Vancouver. Two storeys, frame, concrete foundation, hot water heating, electric lighting. Tenders received after July 27th.

Tenders to be called for apartment house, $350,000, Nelson between Burrard and Thurlow. Owner, E. D. Boucher, Vancouver; architect, Stroud & Keith, Carter-Cotton Building, Vancouver. Ten storeys, 66 x 131, steel and concrete. Tenders received after August 15th.

Tenders called for residence, $10,000, Shaughnessy Height. Owner, Mrs. A. N. Winters; architect, Somervell & Putnam, Pacific Block, Vancouver. Two storeys, brick veneer, stone foundation, hot water heating, electric lighting.

Work in progress for apartment house, 2425 Main street. Owner, P. Lee; architect, Stroud & Keith, Carter-Cotton Building, Vancouver; steel contractors, J. Coughlan & Sons, Carter-Cotton Bldg. Six- storey, steel. Part of steel has been delivered. Architect will probably call for tenders shortly.

Westmount, Que.

Tenders called for residence, Westmount avenue. Owner, M. S. Stevenson, 244 Victoria avenue; architect, P. J. Turner, 121 Board of Trade, Montreal. Three storeys, pressed brick and stone, stone foundation, metal casements, lead glazing, mahogany and chestnut finishing. Tenders received until July 31st.

Windsor, Ont.

Tenders to be called for residence, $4,000, Ouelette avenue. Owner, Louis Deziel; architect, Jacques & Williamson, Windsor. Two storeys, 27 x 37; frame and stucco, brick foundation, cut stone, iron columns, hot water heating, electric lighting and gas, shingle roof, shingle stain, electrical work, oak interior finish. Tenders received after August 3 until August 10th.

Yorkton, Sask.

Tenders called for residence. Owner, Bank of Toronto, Yorkton; architect, Wm. Bruce, 22 McDermot avenue, Winnipeg, Man. Plans and specifications at the Bank of Toronto, Yorkton and with architect. Tenders received by architect until July 28.

CONTRACTS AWARDED

Brockville, Ont.

The contracts for a $4,200 residence for Dr. W. H. Woodrow, on Hartley St., have been awarded as follows: Masonry, Alex. Anderson; carpentry, S. Watson; cement, O. Anderson; plastering, G. Barclay; heating and plumbing, Brown & Semple; sheet metal, W. Harrison; stone work, A. Anderson, all of Brockville.

Ottawa, Ont.

The contracts for a residence to be erected on Nepean St., by W. H. A. Fraser, of 180 Metcalfe St., have been awarded as follows: Plastering, Brooks & Davis, Ottawa; heating, McKinley & Northwood, Rideau St. W. E. Noxke, architect, Central Chambers, Ottawa.

Port Arthur, Ont.

The contract for the erection of a $3,500 residence by H. E. Rogers, has been awarded to Lester Carn, Port Arthur. Building to be 2 storeys, brick veneer and concrete.

Vancouver, B.C.

Residence, $4,300. Owner, J. Souter, 1137 Davie street, Vancouver; architect, Thos. Hooper, Winch Building, Vancouver; general contractor, J. Sinfield, 647 Grove street, Vancouver. Two storeys, frame. Contract was let July 20.

Business Buildings and Industrial Plants

Brandon, Man.

Machinery required for elevator. Owner, Maple Leaf Milling Co., Brandon. Machinery for 40,000 bushel elevator now under construction. No further details available owing to temporary absence of manager.

Brockville, Ont.

Charter applied for, Brockville Atlas Motor Co., Hamilton street. Parties interested, T. J. Storey, of the Canada Carriage Co., Brockville; W. H. Comstock, ex-M.P., C. W. MacLean. Plans for the first building are completed. One storey, 150 x 50, concrete foundation, brick walls, suspension roof.

Tenders to be called for stores and flats, $6,000. Owner, F. L. Kincaid, Brockville; architect, A. Stuart Allaster, Brockville. Two storeys, 50 x 48, brick, stone foundation, electric lighting, composition roofing, interior finish white pine, cement work, brick, artificial stone, structural iron, sheet metal work, skylights, pipe covering, electrical work, electric bells, roofing, sheathing and deafening paper, steel beams, plate and prismatic glass. Tenders received after August 1st.

Cap. Rouge, Que.

Tenders called for workshop, $2,000,000. Owner, Grand Trunk Pacific; architects, Marchand & Tanquay, Quebec. Stone foundation, brick, stone, steam heating, cut stone, terra cotta, tile, pipe covering, steel beams, electric lighting, structural iron, telephone system, electric bells, sprinkler system, machinery of all kinds. Tenders may be advertised any day.

Chatham, Ont.

Damaged by fire, store. Owner, The McDonald Furniture Company; damage, $8,000 to building and $16,000 to furniture, $8,000 of this being covered by insurance. Building will be repaired and a complete set of furniture installed.

Dauphin, Man.

Tenders called for hotel. Owner, J. Clark; architect, J. H. Bossons, Dauphin. Brick and stone. Plans, etc., at office of architect. Tenders called until July 29th.

Tenders called for hotel, $50,000. Owner, Jos. Clarke, Dauphin; architect, J. H. Bossons, Dauphin. Four storeys, 50 x 150, brick, concrete foundation, steam heating, electric lighting, interior finish oak, cement work, cut stone, reinforced concrete, metallic lath, fire escapes, freight and passenger elevator, electric work, electric bells, iron columns. Tenders closed August 1st.

Drayton, Ont.

By-law carried for mill. By-law carried (172 for and only 1 against) to grant a loan of $4,000, free site, etc., to Canadian Flax Mills, Ltd.

Espanola, Ont.

Plans being prepared for hotel. Owner, The Spanish River Pulp & Paper Co., Espanola, Ont.; architect, H. W. Angus, North Bay, Ont. 37 x 150, brick veneer, concrete foundation, hot water heating, electric lighting, brick, structural iron, fire escapes, pipe covering, electric bells, roofing, sheathing and deafening paper, steel beams. Tenders called later.

Fort George.

Al. Johnson will at once rebuild his hotel, which was destroyed by fire recently.

Guelph, Ont.

Tenders called for stores and offices, $12,000. Owner, W. E. Buckingham, Guelph; architect, W. F. Colwill, Guelph. Three and one storey, 46 x 90, brick and stone, artificial stone, stone foundation, cement work, terra cotta, structural iron, iron and skylight roof, ornamental iron, sheet metal work, steel beams, iron columns, hot water heating, electric lighting, plate and art glass. Tenders closed August 1st.

Tenders to be let for newspaper building, $27,000. Owner, H. Gunner and E. G. Gunner; architect, W. A. Mahoney, Guelph. Four storeys, 47 x 49, brick and stone, stone foundation, steel beams, cut stone, terra cotta, artificial stone, hot water heating, vaults, freight and passenger elevators, fire escapes, prismatic glass, electric bells. Old building remodelled, addition as above. Tenders to be let shortly.

Tenders to be called for horse stables, $8,000. Owner, Winter Fair Board, Parliament Buildings, Toronto; architect, W. A. Mahoney, Guelph. One storey, 40 x 282, brick, stone foundation, three furnaces, electric lighting, iron roof, metal ceiling. Tenders to bec alled this week; subway to be built between old and new building.

Tenders to be closed for factory, $35,000. Owner, Independent Tire Co., Guelph; architect, W. A. Mahoney, Guelph. Four storeys, 60 x 260, brick, stone foundation, reinforced concrete, flat, tar and gravel roof, steel beams, iron columns, fire escapes, freight elevator, machinery. Tenders not let, awaiting sale of stock.

Halifax, N.S.

Plans being prepared for addition to factory, $12,000, Argyle street. Owner, Moirs, Ltd., Argyle street; architects, Dumeresgue & Cobb, St. Paul Building, Halifax. Six storeys, reinforced concrete, cut stone, armored concrete, fireproof doors and windows, electrical work.

Hamilton, Ont.

Work in progress for garage, $1,400, Bold street. Owner, T. C. Sealy and J. A. Armes, Federal Life Building, Hamilton; architec, Hamilton Architectural Company, Federal Life Building, Hamilton. One storey, 40 x 60, brick, stone foundation, hot water heating, electric lighting, tar and gravel roof. Armes will build garage. Oil tank wanted.

Tenders called for factory, $40,000, Victoria avenue north. Owner, Otis Fensom Co., Ltd., Hamilton; architects, Stewart and Witton, 7 Hughson street, Hamilton. Two storeys, 271 x 75, steel, frame, brick, steam heating, structural iron, electric lighting. Iron making machinery required. Tenders received after July 27 until August 5th.

Medicine Hat, Alta.

By-laws to be submitted for engineering and construction. Owner, City of Medicine Hat, Alta.; city clerk, W. F. Heal; city engineer, A. K. Grimmer. The following will be submitted on August 24th: $3,385 for the improving of the market buildings; $650 for the purchase of a site for a sub-fire station; $76,000 for the extension of the gas plant.

Montreal, Que.

Machinery required for flour mill. Owner, Dominion Flour Mills Co., Ltd., Brantford, Ont. Engineers, J. A. Jamieson, 313 Board of Trade Building Montreal; general machine contractor, the Nordyke & Marmion Company, Indianapolis, Ind. Tenders will be called shortly by General Machine Contractors for heating and electric motor control machinery. Tenders received by engineer.

Moose Jaw, Sask.

Reconstruction of business building, Main street. Owner, J. D. Reed; architect, Story & Van Egmond, Regina. Excavation contractor, W. E. Rawson, Moose Jaw. Six storeys. Building collapsed on the 18th inst.

Milton, Ont.

Work in progress for brick works, $100,000. Owner, Brandon Brick and Tile Co., Ltd. Building is partly constructed. Appliances of different kinds will probably be required.

North Sydney, N.S.

Contemplated, business building. Owner, Alex. MacDonald, North Sydney. Alex. MacDonald will in the near future build a large building on the site recently purchased. It is understood that the building will be for tailoring and the upper part will be for offices.

New Glasgow, N.S.

Sale of plant, woodworking and sawmill, Barney's river. Party interested, J. D. & P. A. MacGregor, Ltd., New Glasgow. Woodworking factory and sawmill, etc., well equipped, on Intercolonial Railway, with siding; ample water power; farm of 150 acres; house; mill dam, etc.; about 1,00 acres of woodland suitable for the manufacture of furniture or any line of hardwood. In addition to standing timber plenty of birch, maple and beach.

New Westminster, B.C.

The Canadian Western Lumber Co., at Fraser Mills, will spend about $300,000 in extending their plant, which will include a sash and door factory and cedar shingle mill.

North Bay, Ont.

The Sweet Machinery & Foundry Co. will locate a new plant at Cobalt, Ont.

Orillia, Ont.

Specifications in progress for factory, $200,000. Owner, Tudhope Co., Ltd., Orillia, Ont. Two storeys, nine buildings, 310 x 78; 290 x 80; 95 x 80; 55 x 20; 290 x 80; 160 x 80; 130 x 80; brick and slow burning, cement foundation, steam heating, electric lighting, machinery. Webb & Sons, Orillia, have contract. Work to be done by day labor and to commence at once.

Oshawa, Ont.

A new company (Brick, Limited) has been organized to do business in Oshawa, capitalization $40,000. They will manufacture bricks and tiles. 12 acres of land has been bought and the purchase of machinery has already begun. Mr. Wm. Lowe, manager.

Point Grey, B.C.

Reeve Bowser will erect a large business block on the southwest corner of Wilson road and West Boulevard.

Princeton, B.C.

Plans being prepared for bank, $10,000. Owner, A. E. House Co., Princeton; architect, F. Clerk King, Princeton. Two storeys, frame, concrete foundation, steam heating. The building will be used for office also.

Preston, Ont.

The Pattinson Woolen Mill are extending their mills to the extent of $60,000.

The Crown Furniture Co., addition to their factory, 60 x 140. Contract awarded to Wirsching Bros.

The Preston Car & Coach Co., addition to factory, 60 x 200, metal clad, $8,000.

The Buffalo Shed Co. are building a factory, 40 x 140. Cement and glass, patent roofing.

Machinery required for woodworking plant. Owner, Preston Woodworking Machinery Co., Preston; superintendent, M. Mullen; manager, W. T. Murray, Preston. Tenders are being called for the following: planers, lathes, drills, shapers, milling machines, gears, cutters, [illegible]

(Continued on page 66)

Tenders and For Sale Department

Canadian Delivery

[illegible] Rand New Giant Drill, No. 431 [illegible]

Ingersoll "Little Giant" Rock Drill, No. 3¼. Complete; good order.

Jas. Cooper Mfg. Co., No. a Small Rock Drill. Good order.

[illegible] Steam Pump, 6 x 4 class, with valve, piping and elbow. New.

Emerison Pulsometer Pump, size B. New.

[illegible] Cableways Complete.

Brown 10-ton Hoist; overhauled. First Class.

Stone Screen for crusher, 24 in. x 4 ft. of 2-in. holes, 2 in. of 1 in., shaft and gear.

Thirty horse power upright boiler, 46 in. x 10 ft., complete. Good order.

THE MALES COMPANY,
No. 82 Perin Bldg., Cincinnati, O.

Department of Railways & Canals

Intercolonial Railways—Improvements at Halifax

FURTHER EXTENSION OF TIME

The time for receiving tenders for Pier and [illegible] has been further extended from Monday, the 31st day of July, 1911, to **Thursday, the 10th day of August, 1911, at 12 o'clock noon.**

By order,
L. K. JONES,
Department of Railways and Canals,
Ottawa, July 17th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 30-31

TOWN OF NORTH BAY

Water Works Extension

Sealed tenders endorsed "Tender A" and "Tender B," "Tender C" and "Tender D," will be received by the undersigned up to **Saturday, August 5, 1911.**

Contract A. The laying of approximately 46,945 lineal feet of water mains, placing valves, valve boxes, hydrants, etc.

Contract B. The laying of approximately 500 lineal feet of 16 in. steel intake pipe, the construction of concrete pump well on lake shore and the necessary connections to two pumps.

Contract C. The supplying of approximately 15,500 feet lineal 14-in. pipe; 500 ft. lineal 16-in. steel pipe; 2,550 feet lineal 10-in. pipe; 27,745 feet lineal 6-in. pipe; 1,100 feet lineal 4-in. pipe; and the necessary tees, crosses, curves, etc.

Contract D. The supplying of approximately 32 hydrants, 11 14-in. gate valves and valve boxes, 5 10-in. gate valves and valve boves, 40 6-in. gate valves and valve boxes, 3 4-in. gate valves and valve boxes.

Separate tenders are desired for the supply of and laying of steel pipe, (2) cast iron pipe, and (3) wood stave pipe, in contracts "A" and "C".

Plans and specifications may be seen at the office of the Commissioner of Works, North Bay.

The lowest or any tender not necessarily accepted.

T. N. COLGAN,
Commissioner of Works.
North Bay, July 11, 1911. 29-31

Tenders

Sealed tenders addressel to the undersigned will be received until **Monday, August 7th,** for the construction of a Municipal Drain in the Township of Minto. The estimated amount of excavation is 21,600 cubic yards, and the work must be completed by November 1st, 1912.

Profile and specifications can be seen at the office of the undersigned.

W. D. McLELLAN,
Clerk of Minto,
30-31 Harriston, Ont.

Tenders for a Steel Bridge

Sealed tenders marked "Tender for Bridge," will be received by the undersigned up to noon on **Monday, August 7th, 1911,** for the construction of a 40-foot span over the Humber River, on the Seventh Line, Albion Township, about one mile from the Village of Palgrave.

Specifications may be obtained from the undersigned.

The lowest or any tender not necessarily accepted.

C. R. WHEELOCK,
County Engineer.
Orangeville, July 22, 1911. 30-31

Department of Railways and Canals

Intercolonial Railway

FREIGHT SHED at HALIFAX

Sealed tenders addressed to the undersigned and endorsed "Tender for Freight Shed at Halifax," will be received at this office until 12 o'clock noon of the **1st of August, 1911,** for the construction of a Freight Shed on the Quay Wall at Halifax, N.S.

Plans, specifications and form of contract to be entered into may be seen and full information obtained on and after this date, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Intercolonial Railway at Moncton, N.B., or at the office of the Board of Trade, Halifax.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $2,000,000 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Department of Railways and Canals,
Ottawa, July 17th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 30-31

CITY OF GUELPH

Tenders

Tenders will be received by T. J. Moore, city Clerk, Guelph, Ontario, for the construction of a reinforced concrete arch bridge and viaduct over the Canadian Pacific Railway and the River Speed, Guelph, up to **Tuesday, August 8th, 1911.**

Approximate amount of concrete is 521 yards.

A marked cheque for $400 is to accompany the tender.

Forms of tender may be obtained from, and plans and specifications seen at the office of the City Engineer, Guelph, or at the offices of the Contract Record and Canadian Engineer, Toronto, Ont.

Plans and specifications may also be obtained for the sum of $5.00 per set, which will be returned upon return of plans.

Lowest or any tender not necessarily accepted.

L. MALCOLM,
Acting City Engineer.
Guelph, July 21st, 1911. 30-31

TOWN OF WILKIE

Sealed tenders will be received by T. A. Dinsley, Secretary-Treasurer of the Town of Wilkie, until noon, **Monday, August 21, 1911,** for supply and delivery of the following machinery, materials, and performance of certain works:

Tender A.—Electrical Machinery—

(1) One 60 kw. 3-phase, 60 cycle, 2,200 volt a.c. Generator.
(2) One Exciter for above.
(3) One marble switchboard, instruments and switches.
(4) Three 2,200 voltmeters, back-geared to pumps.
(5) Five transformers for lighting system.
(6) Series Tungsten street lighting system.
(7) Approximately 25 cwt. of weather-proof copper wire (line material, guy wire, arms, pins, insulators, etc.)
(8) Cedar poles.

Tender B.—One 100 1 H.P. Internal Combustion Engine—

Tender C.—Pumping Machinery—

(1) One working head and deep well cylinder.
(2) One-half million gallon pump.
(3) One air compressor.
(4) Necessary shaftings and belting.

Tender D.—

One Pneumatic Storage Tank.

Tender E.—

Approximately 1,100 ft. 8-inch. c.i. water pipe.
Approximately 4,800 ft. 6-inch c.i. water pipe.
Approximately 2,000 ft. 4-inch c.i. water pipe.
Approximately 15 hydrants and 22 valves.

Tender F.—

Trenching, laying cast iron water pipes, hydrants, valves, etc., and back filling.

Tender G.—

Erection of power house and construction of reservoir.

Plans and specifications may be seen at the office of the secretary-treasurer of the Town of Wilkie, or on application to the Engineers, McArthur & Murphy, Room 8, Bottomly Block, Saskatoon, Sask.

A marked cheque for five per cent. of amount of the tender must accompany each bid.

The lowest or any tender not necessarily accepted.

McARTHUR & MURPHY, Engineers
Bottomly Block, Saskatoon, Sask.

T. A. DINSLEY, Secretary-Treasurer,
30-31 Wilkie, Sask.

BUCKET CRANE

FOR SALE—One 10 to 15-ton No. 1 Browning Locomotive crane, standard gauge, 4-wheel truck, 38 ft. steel boom, 8 x 10 engines, equipped to handle clam or orange peel. Will furnish with or without bucket. Attractive price, fine condition, quick delivery. Inspection here.

WILLIS SHAW MACHINERY CO.,
39 South LaSalle Street,
Chicago, Ill.

FOR SALE

Complete Electric Generating Set, consisting of Leonard Peerless steam engine direct connected to 150 k.w. Canadian General Electric generator, **2,300 volts, 60 cycles**; also condenser, switchboard, steam and exhaust piping, spare parts for engine and generator, and everything constituting the complete set as at present installed in the Thomas street lighting station of the Town of Brockville. This machine is in first-class order, having only been used on peak loads. It is now being replaced by a larger Belliss & Morcom engine with Swedish G. E. generator. Full particulars and price can be obtained from Laurie & Lamb, Consulting Engineers, Board of Trade Building, Montreal.
28-35

TOWN OF GLEICHEN
Alberta

Waterworks

Sealed tenders, addressed to the undersigned, will be received until 18 o'clock, on **Friday, 11th August, 1911**, for the following:—

One 54-in. x 14-ft. Return Tubular Boiler and Stack.

One 500-gallon per minute Duplex Steam Pump.

One Air-compressor and Air-lift Pump.

Specifications and all information may be obtained at the offices of the engineers, the John Galt Engineering Company, 317 Portage avenue, Winnipeg, Man. ... ...

The lowest or any tender may not necessarily be accepted.

W. J. BURR,
Secretary-Treasurer.
Gleichen, Alberta. 31-31

CITY OF MOOSE JAW
Saskatchewan

Sewer and Water Extensions

Sealed tenders will be received by the City of Moose Jaw, addressed to the undersigned City Clerk, until 8.30 p.m., on **Monday, August 14th, 1911**, for the laying of approximately 16,885 lin. feet of sewer and water extensions, as well as for the shpply of all cast iron and vitrified tile pipe and specials, etc.

Any tender received after the above stated time will be declared informal.

Plans and specifications for the construction work may be seen at the office of the City Engineer, and specifications for the supply of materials may be obtained from the City Engineer's [illegible]

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.
Moose Jaw, Sask., July 21, 1911. 31-32

Tenders

Tenders will be received by the undersigned until **August 19th, 1911**, for supplying and installing a six-million gallon Centrifugal Pump and Steam Engine. Specifications may be obtained from the City Engineer. Tenders must be plainly marked on the outside.

M. H. BAKER,
City Engineer.
St. Thomas, July 29, 1911. 31-33

Applications

Will be received by the undersigned for the position of City Engineer, or a competent Foreman, with municipal experience, to take charge of the public works of the City of Chatham, Ontario.

Applications to be in not later than 4 p.m. on **Monday, August 7th.**

W. G. MERRITT,
Clerk of Chatham.
31-31

To Contractors

Separate tenders endorsed "Tender for New Government House," addressed to the undersigned, will be received at this Department until noon of **Tuesday, August 22nd**, for the stone and brick work, fireproofing, steel work, roofing and carpenter work, for the new Government House in Chorley Park, Rosedale, Toronto. Plans and specifications may be seen at this department.

An accepted bank cheque payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender, and the bona fide signatures and addresses of two sureties, must accompany each tender.- Cheque will be forfeited to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after acceptance. The department will not be bound to accept the lowest or any tender.

By order,
H. F. McNAUGHTEN,
Secretary Public Works Department.

Department of Public Works, Ontario, Toronto, July 21st, 1911.

Newspapers publishing this advertisement without authority will not be paid for it.
30-31-32-33

Town of Battleford, Sask

Tenders

FOR THE ERECTION OF

A New Town Hall

Sealed tenders, addressed to the Secretary-Treasurer, will be received by the Town Council of Battleford until 12 o'clock noon, **August 14th**, for supplying all materials and erecting a Town Hall.

Plans may be seen and specifications and form of tender obtained at the office of the Town Engineer, Battleford. Plans may also be seen at the office of the Canadian Engineer, Winnipeg, and at the office of Messrs. Gorman, Clancey & Grindley, Edmonton.

Separate tenders will be received for the heating plant.

Tenders must be accompanied by an accepted cheque for five per cent. (5 p.c.) of the amount of the tender.

WILLIAM KITSON,
Town Engineer.
H. C. ADAMS,
Secretary-Treasurer.
31-31

Positions Vacant

Advertisements under this heading two cents a word per insertion.. Minimum charge 50 cents

AGENTS WANTED—United States firm manufacturing sawmill, well-drilling and prospecting machinery, desires to secure Canadian representatives. For particulars write E. J. McIntyre, 4059 Perry street, Chicago, Ill. 30-31

FOREMAN WANTED.—Wanted, a Construction Foreman on a large mill to be erected in Toronto, one who understands masonry, carpentry, and steel construction, also familiar with local conditions. Engagement September 1st. Apply Box 305, Contract Record, Toronto. 30-31.

SUPERINTENDENT WANTED.— Superintendent of Construction; a man thoroughly familiar with all kinds of form work for reinforced concrete buildings, must be a first-class man. First class salary. State experience and give references. Box 306, Contract Record, Toronto. 30-31

Business Notes

Bathurst, N.B.

Sale reported of lumber mill. Owner, Nepisguit Lumber Co. The mill and property will be sold at auction at Bathurst on September 7.

Fredericton, N.B.

The T. S. Simms Company, of St. John, manufactureres of brooms and brushes, are contemplating the removal of their business to this city.

Nanaimo, B.C.

The Clay district in this vicinity is to be exploited, plant to be erected and operated by a company seeking incorporation as the Vancouver Island Clay Products Company.

Orillia, Ont.

The following merger has been formed—The Tudhope Knox Co., of Orillia, makers of steel trucks; the Perrin Plow & Stove Co., Smith's Falls, makers of plows, stoves, etc., and the Tudhope Anderson Co., of Winnipeg, selling agents, having agencies at Winnipeg, Regina, Calgary and other large centres in Western Ontario. They have also acquired the West Lorne Wagon Co. F. R. Oliver, of the Perrin Plow & Stove Co., will move to Orillia, where Perrin plows will be manufactured in future. The Smith's Falls plant will be enlarged and devoted wholly to the manufacture of stoves.

Powell River, B.C.

The Powell River Paper Company's general store and office were destroyed by fire on the 14th inst., also other buildings.

Fredericton, N.B.

Legal sale of lumber property. The lumber property of the Alexander Gibson Railway and Mfg. Co., Marysville, York County, this province, was sold at public auction under order of the equity court, at Fredericton, June 15, 1911, to Farnsworth & Jardine, the Liverpool (Eng.) lumber dealers, for $1,000,000. It is believed that the property will be turned over to the Nashwaak Lumber Co., being organized with a capital of $5,000,000. Incorporators are Lieut. Col. Hugh H. McLean, M.P., of St. John, Lawrence MacLaren, J. S. MacLaren, Alfred Rowley, and Fred R. Taylor.

[illegible] tumbling mill girders, motors, etc., for hydro-electric power. Cost, about $[illegible].

Port Arthur, Ont.
Work in progress for hard coal shed, $[illegible]. Owner, Canadian Northern Coal and Ore Dock Co., Ltd., general contractor, Barnett & McQueen, Fort William, Ont.; roofing contractor, D. W. Holmes, Superior, Wis. Tar and gravel Carey roofing.

By-law to be submitted for factory, $30,000, Queen street. Owner, J. L. McRae, Port Arthur. Purpose of factory, to manufacture school desks, office furniture ,etc. The construction will likely be handled by Mr. McRae, as he is a building contractor. Vote taken on August 10th.

By-law to be submitted for storage plant, Waterfront. Owner, The General Storage Corporation, Ltd. John O'Gorman, Toronto, is asking certain assistance from ratepayers. By-law to be submitted August 10th. First building to be erected, eight storeys, 500 by 600 feet. Initial expenditure, $400,000. The general opinion is that by-law will carry.

Quebec, Que.
Preparing to re-build laundry. MacMahon street. Owner, A. S. Pfeifer & Co. Preparing to re-build the building gutted by fire on July 20th; walls good; work to be done by day labor. Machinery badly damaged.

Saskatoon, Sask.
Site prepared for warehouse, Twenty-third street. Owner, McLaughlin Carriage and Automobile Co., Oshawa, Ont. Will start work at once on the erection of a new warehouse.

Sudbury, Ont.
The Dominion Turpentine Co., capital $250,000, propose to establish a large factory here. Nothing definite has been decided.

Sault Ste. Marie, Ont.
TheSuperior Pulp and Paper Company will erect a $4,000,000 paper mill and work has already commenced on clearing the property purchased from the Lake Superior Corporation.

Trochu, Alta.
Plans for the Royal Hotel are out, brick and stone, costing $60,000.

Toronto, Ont.
Contemplated, office, Sheppard and Richmond streets. Owner, H. Gagnier, Ltd., 28 Adelaide street east, Toronto. Nine storeys, steel, concrete and brick, concrete foundation. Building on site being demolished.

Work in progres for store and residence, $3,700, south side Bloor street west. Owner, Cooper & Son, Bloor st. and Symington avenue; architect, W. E. Cunningham, 84 Geoffrey street, Toronto. Two storeys, brick and stone, brick foundation, hot water heating, electric lighting, felt and gravel roof.

Contemplated, office, $125,000, 85 Adelaide street west. Owner, S. Frank Wilson, 77 Adelaide street west, Toronto. Ten storeys, reinforced concrete. Owners are awaiting decision of the city council re by-law concerning reinforced concrete buildings.

Tenders called for additions and alterations to office building, northwest corner Adelaide and Victoria streets. Architects, Symons & Rae, 15 Toronto street, Toronto. Seven storeys, 120 x 54, steel and brick, steam heating, electric lighting, cement work, cut stone, marble, terra cotta, tile, fireproofing, structural iron, fire escapes, vaults, sheet metal work, steel beams, plate glass, extension to elevators, electric fixtures, etc. Tenders close August 1.

Transcona, Man.
Tenders received for addition to car shop. Owner, National Transcontinental Railway, Ottawa; secretary, P. E. Ryan, Ottawa. The tender of Haney Quinlan & Robertson, Montreal, Que., $2,500,000, was the lowest. This firm has been awarded the contract for protection work on the Soulanges Canal, Ont.

Vancouver, B.C.
Preliminary plans prepared for warehouse, between Yukon and Alberta sts. The Vancouver Breweries Co., Ltd., 263 Seventh avenue east, are planning the erection of a 3-storey warehouse.

The British Columbia & Vancouver Island Tourist Hotel Company are contemplating the erection of an hotel at Shawingan Lake.

Work in progress for office building, Hastings street. Owner, J. K. Sutherland, 1901 Barclay street. Excavation contractor, Hawley & McMillan, $5,000. Six storeys, reinforced concrete.

The Pacific Electric Heating Company will establish their Canadian plant in Vancouver. A building has been leased in the east end and operations will be started immediately.

Plans have been prepared for a warehouse to be built by the Campbell Storage Co., 857 Beaty street on the C. P. R. reserve near the Cambie street bridge. The building will be of corrugated iron and frame construction. J. W. Hooper, architect. W. McMillan, contractor.

Vernon, B.C.
Some of the buildings in course of construction are: Hudson Bay Company's 2-storey block, $60,000; Post Office and Customs House; C. P. R. station, $22,000; Union Bank Block.

Woodstock, Ont.
Contemplated, factory, $25,000. Owner, Bain Wagon Co., Woodstock. Four storeys, 127 x 50, brick and cement, cement foundation, steam heating, electric lighting, tar and gravel roof, fire escapes, freight elevator, sprinkler system, iron columns. Contract not let yet.

Specifications in progress for knitting factory, $30,000. Owner, Oxford Knitting Co., Woodstock; architects, Taylor & Taylor, Brantford. Two storeys and basement, brick, hot air heating, electric lighting, asphalte roofing, interior finish wood, brick, fire escapes, knitting machinery.

Windsor, Ont.
Tenders to be called for market shed, $3,000. Owner, City of Windsor; architect, Jacques & Williamson, Windsor. One storey, 20 x 80, frame, metal and concrete, cement work, concrete foundation, metal work. Tenders received after August 3 until August 10.

CONTRACTS AWARDED

Brantford, Ont.
Carpenter shop, $13,500, Mohawk st. Owner, Cockshutt Plow Co., Brantford; general contractor, A. E. Faulker, Brantford. Three storeys, 110 x 60, brick, concrete foundation. Contract was let July 25th. Heating and plumbing contract not let yet.

Calgary, Alta.
Warehouse, $40,000. Owner, John Deere Plow Co., Ltd. Successful contractor, Mackissock & Thomas, Limited, Winnipeg and Calgary.

Fort William, Ont.
Warehouse, $100,000. Owner, International Harvester Co.; contractor, Elliot Construction Co., Minneapolis Minn. Supervisor of Construction, H. J. Powers, Empire Hotel, Fort William.

Guelph, Ont.
Factory. Owner, Independent Tire Company, Guelph; architect, W. A. Mahoney, Guelph; general contractor, P. H. Secord & Sons, $47,000. Four storeys, 60 x 260, reinforced concrete, flat, tar and gravel roof, steel beams, iron columns, fire escapes, freight elevator, machinery.

Hamilton, Ont.
Factory, $12,000, Garth street. Owner, Zimmerman Mfg. Co., Hamilton, Ont.; architect, P. M. Smith, Hamilton; contractor, W. A. Yates, Hamilton. Two and one-half storeys, stone and brick, 125 ft. x 60 ft. fi

Moose Jaw, Sask.
Warehouse, $45,000. Owner, Tees & Persse, 315 William street, Winnipeg; general contractor, D. A. Girvin, Moose Jaw. Three storeys, 54 x 114, foundations for six storeys put in, brick, stone. Excavation will be commenced at once.

North Bay, Ont.
Business block, $6,000. Owner, L. Bunyan, North Bay; general contractor, J. P. Quinlan, North Bay. Two storeys, 34 x 48, brick, stone foundation, hot water heating, electric lighting, cut stone, structural iron, sheet metal work, metal ceiling, cornice, iron columns, roofing, pipe covering, plate glass, vaults, skylights, interior finish pine. Heating and plumbing contracts not yet awarded.

Vancouver, B.C.
Business block, $15,000, 538 Cordova street. Owner, David Spencer, 515 Hastings street west, Vancouver; architect, Thos. Hooper, Winch Building, Vancouver; general contractor, Purdy & Henderson, 543 Granville street, Vancouver. Four storeys, brick. Contract was awarded July 20.

Power Plants, Electricity and Telephones

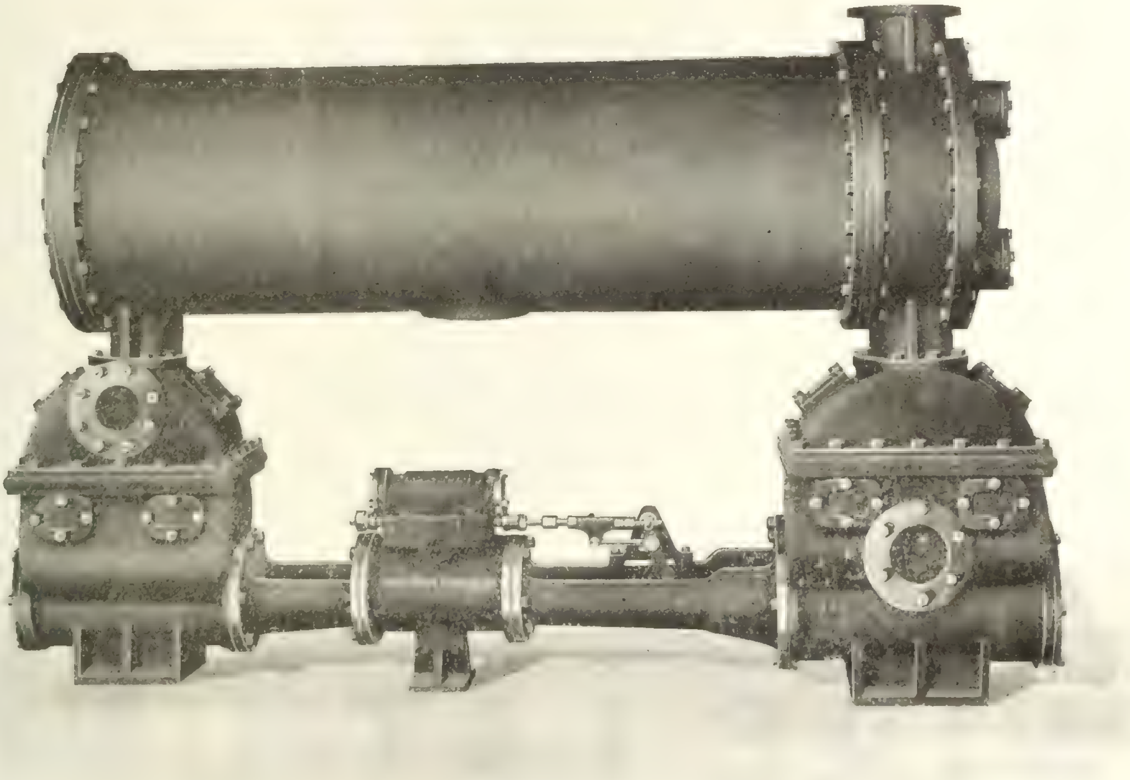
Hamilton, Ont.
By-law carried for municipal power plant. Owner, City of Hamilton. By-law $502,878 passed July 25. Specifications along lines of report received by city council and made by E. I. Sifton, London, Ont., will be ordered in a few weeks.

MacLean Daily Reports

The only systematic method yet devised for reporting BUILDING AND ENGINEERING projects from their inception to completion. Ask us for Rates and Specimen Reports.

220 King Street West - TORONTO

CONDENSORS



Condensor built by The John Inglis Co., Limited

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

Let us Submit Prices.

The **John Inglis Company** Limited

Engineers and Boilermakers

14 Strachan Ave., TORONTO, Canada

Medicine Hat, Alta.

One well, Johnson Park. Owner, City of Medicine Hat, Alta; engineer, A. K. Grimmer, Medicine Hat; contractor, [illegible] Realty Co. $12,000, $8,500 for drilling and $4,000 for casing; well 1,200 feet deep, 10-in. diameter at bottom. Contract awarded July 21. Contractor will want casing.

Toronto, Ont.

A new system of gas production, consisting of engine generator and purifiers to be installed by the Pintsch Compressing Co., in their building at the foot of John street, which is being enlarged to accommodate the necessary plant.

Tenders called for one-storey addition to gas house, $4,800, foot of John street. Owner, the Pentch Compressing Company, Toronto. One storey, brick and steel, concrete foundation, galvanized iron roofing, cut stone, metal roofing, steel beams. Tenders closed July 29th.

Winnipeg, Man.

Tenders called for supplies. Owner, Winnipeg Electrical Distributing System; secretary board of control, M. Peterson. Manufacture and delivery f.o.b. Winnipeg, of the following; triple braid weatherproof wire and cable; cross arms; pins; insulators; lightning arresters; galvanized steel wire; miscellaneous hardware; paint, tapes and solder. Information obtained at office of City Light & Power Department, Main st. Tenders received by chairman, board of control, until July 31st.

Plans being prepared for telephone exchange, $50,000, East Main street. Owner, Bell Telephone Co., Montreal; architect, company's architect. Sheel and brick, stone foundation.

Yale, B.C.

Burns Jordan and Welch have been awarded the contract for the construction of a tunnel near here, 2,075 feet.

New Companies

The Port Stanley Telephone Company, Limited, Port Stanley, incorporated, capital $1,000; provisional directors, Neil Burlton, Edgar Earnshaw and Mason D. Hyndman, all of the Township of Southwold, Elgin County.

Russell Rural Telephone Co., Navan, Ont., incorporated, capital $9,000. Provisional directors, Geo. J. Bonsfield and Marshall Rothwell, of Township of Cumberland, County of Russell.

Sovereign Construction Company, Limited, Toronto, incorporated, capital $850,000. Provincial directors, Burnett Webster and John Irwin Grover, both of Toronto.

The Rudel Belnap Machinery Company, Limited, Montreal, Que., incorporated, with a capital of $40,000, to carry on business as iron founders, mechanical engineers, manufacturers of machinery, etc. Incorporators, Louis Athanase David, Wm. H. Lunney, advocates, and John Holmes Brittle, accountant, all of Montreal.

Griffiths Electric Contractors, Ltd., Winnipeg, Man., incorporated with capital of $500,000, to carry on business as manufacturers of electrical apparatus, machinery, etc. Incorporators include Jas. Kerr Brock, electrical engineer, Viscount Fielding and Lynn Gordon Britsowe, all of City of London, England.

Lucas Patent Granitic Pipe and Cement Construction Co., Ltd., Victoria, B.C., incorporated, with a capital of $100,000.

Bright, McDonald & Co., Ltd., Vancouver, B.C., incorporated, with a capital of $20,000, to carry on business as contractors, engineers, etc.

Omineca Water and Power Company, Limited, Victoria, B.C., incorporated, with a capital of $50,000.

United Lumber and Shingle Mills, Ltd., Vancouver, B.C., incorporated, with a capital of $100,000.

Builders Investment Co., Ltd., Vancouver, B.C., incorporated, with a capital of $50,000.

Halleran Construction Co., Limited, Vancouver, B.C., incorporated, with a capital of $10,000.

The Clark, Green, Wade Logging Co., Ltd., 422 Richards street, Vancouver, B.C., incorporated, with a capital of $10,000.

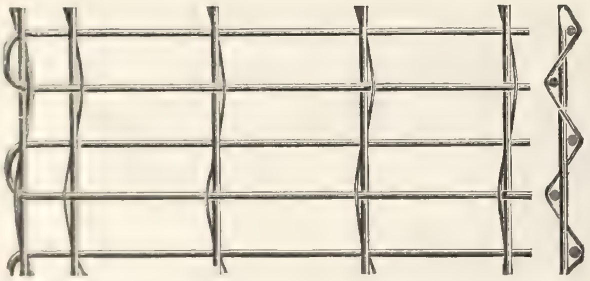
The Northern Telephone and Power Co., Ltd., South Fort George, B.C., incorporated, with a capital of $250,000.

Business Notes

Toronto, Ont.

Wells & Gray, Limited, 315 Confederation Life Bldg., have been awarded the contract for the construction of the Jane street subway at West Toronto for the C. P. R., and also far the large reinforced concrete factory for the Fort Motor Co., at Walkerville, Ont.

WIRE LATHING



Consider the advantages of Greening's Wire Lathing. It is fire proof, rat proof, shrink proof, warp proof. The key is perfect. The plaster cannot become detatched from the lath as it clenches through mesh forming a double coat of plaster. Greening's Wire Lathing is particularly adapted for use in stores, factories and warehouses where the vibration of machinery or the mov- of heavy weights is liable to shake the plaster off ordinary wood lathing.

Every Builder and Architect should have our Lath and Wire Reinforcing Catalog.

WRITE FOR CATALOG NO. 6

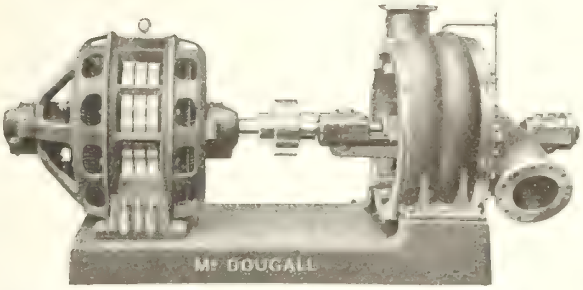
The B. Greening Wire Company, Limited

HAMILTON, ONT. - MONTREAL, QUE.

Worthington Turbine Pumps

For Fire Service

The Turbine Pump while operating at a constant speed will maintain a practically constant pressure and deliver a variable amount of water from nothing up to the full capacity of the pump or even considerably beyond its designed capacity. This feature makes these pumps ideal for pumping directly into the mains of a water supply or for fire purposes, where the amount of water is liable to considerable variation, but where the pressure is required to be maintained. Many illustrations will be found in our NEW BULLETIN 109.

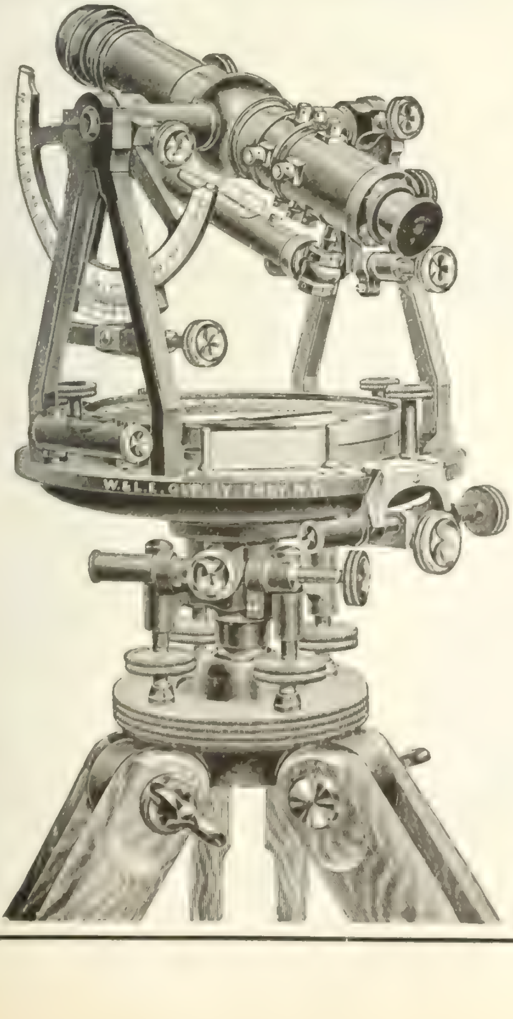


Capacity 1041 Imp., or 1250 U.S. Gals. Per Minute.
Head, 125 lbs. Power, 150 H. P., at 1200 R.P.M.

THE JOHN McDOUGALL
CALEDONIAN IRON WORKS CO.
LIMITED

WORKS:
512 William St., MONTREAL

SALES OFFICES:
MONTREAL, TORONTO, COBALT, WINNIPEG, CALGARY, VANCOUVER


W.&L.E. GURLEY TROY N.Y.

1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic
Engineers and Land Surveyors

Transits
Y Levels
Compasses
Plane Tables
Current Meters
Levelling Rods
Chains
Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

Looking for Business

Then our DAILY REPORT SERVICE will help you. Our organization provides the only systematic method yet devised for reporting Building and Engineering projects from their inception to completion.

Special facilities for gathering news of sales opportunities in machinery, equipment and materials required.

Ask us for further information. Let us send you rates and specimen reports.

We Want Men

We require a man in every important town in Canada to report the progress of the building and engineering activities of his locality. We want men to tell us when machinery, equipment, supplies and materials are required—men who can report promptly and accurately news of all sales opportunities in these trades.

We report this information daily to our subscribers. This enables them to get in direct touch with the buyer.

There are one or two places where we are not represented. Perhaps it is your town. It will be worth your while to ask us.

MacLean Daily Reports

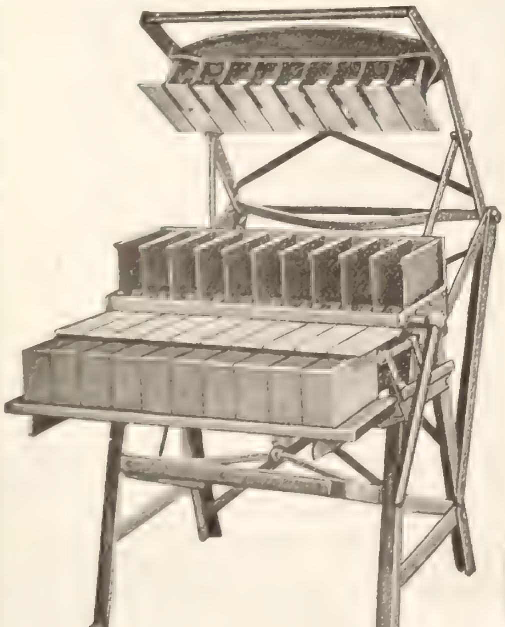
Head Office: 220 King St. West, Toronto. Branches: Vancouver, Winnipeg and Montreal

THE POPULAR AND SUPERIOR

PERFECT BRICK MACHINE

AND MY VARIOUS MOULDS ARE USED IN ALL PARTS OF THE WORLD

Patented in Canada



C. S. WERT

Inventor and Manufacturer of

The Perfect Brick Machine and Moulds

602 North Main St.,
Kendallville, Ind., U. S. A.

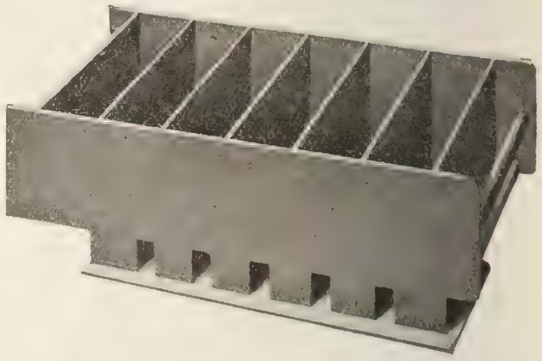
Write for Catalogue and Prices

Agents and Distributers wanted in Canada.

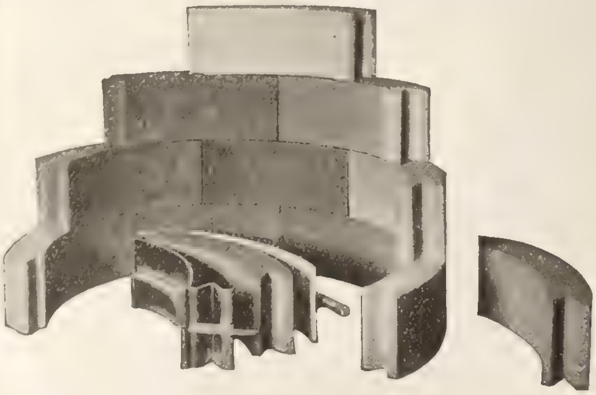
THE POPULAR AND SUPERIOR

PERFECT BRICK MOLD

IS USED IN ALL PARTS OF THE WORLD



The Perfect Well, Cistern and Silo Molds



PRICE LIST

No. 3 Circle Mold. The diameter of its circumference, 3 feet. No. 5 Circle Mold. The diameter of its circumference, 5 feet No. 7 Circle Mold. The diameter of its circumference, 7 feet. All sizes up to 7 foot retail at $12.00 each. All other sizes retail at $15.00 each.

The Circle Moulds vary in length from 22 to 28 inches, depending on the diameter of its circumference.

In ordering Circle Molds always give the diameter of what you are going to build and I will then understand the kind of Circle Mold you desire

No. 10 Circle Mold is 10 ft. diam.
No. 12 " " " 12 " "
No. 14 " " " 14 " "
No. 16 " " " 16 " "

Price $15.00 each

Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

"The durability of a building is the gauge of its value from an economic standpoint."
—The Philosopher of Metal Town.

Absolute perfection in workmanship and quality of material used is the reason for the superiority of our

Corrugated Sheets

Only the best quality COLD ROLLED steel is used—a much tougher and finer material than the hot rolled article.

Each sheet is accurately squared and the corrugations PRESSED one at a time—not rolled—giving an exact fit without waste.

Specify our corrugated sheets and know that you are getting the best—the strongest and most durable on the market.

Flat or curved—galvanized or painted. Any size or gauge

Our special prices on car lots will interest you. Send for our new catalogue No. 70—it contains interesting information on Metallic Building Materials.

Manufacturers 1952

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Enameled Brick

FOR EXTERIOR AND INTERIOR DECORATING AND CONSTRUCTION

Used in all modern buildings where the maximum amount of light and sanitary conditions are essential

Summary of Classified List of Jobs

No.	JOBS	1st Quality	2nd Quality
103	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,991	412,545
50	Private Residences........	1,023,050	70,300
58	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings..............	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses......	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations..............................	281,682	59,923
41	Hospitals, Asylums, Homes...............	1,062,571	110,400
37	Private Stables,...........................	460,320	124,242
32	Railroad Stations and Subways..........	838,501	192,192
56	Mills and Factories........................	609,549	1,075,713
17	Police Stations and Fire Houses............	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs..........................	101,694	
717		17,562,741	

Send for Catalogues and Color Sheets

American Enameled Brick & Tile Co.
1182 Broadway, NEW YORK CITY
Local Agents in Montreal, Toronto and Ottawa.

BRYAN DOORS

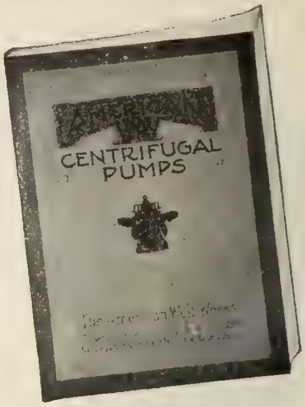
Noted for their Beauty and Durability

Send us your specifications for quotations

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario

Why "American" Centrifugals

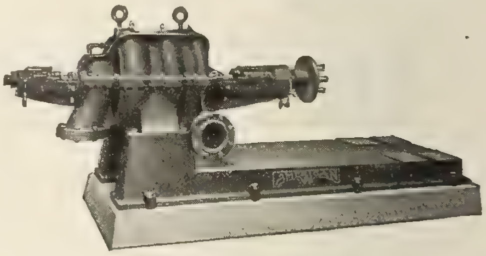
Are Most Economical in the Widest Range of Pumping Conditions.



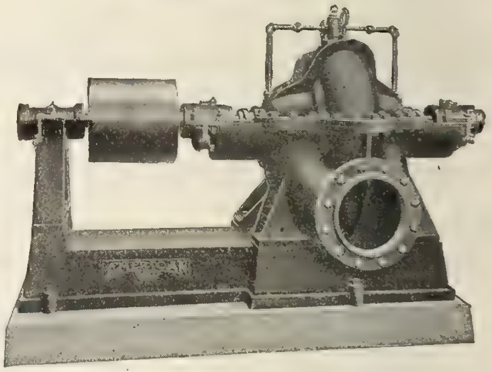
The reason why "American" Centrifugals are unequalled for economy is that they represent the highest development of the most modern type of pump and there are the best of reasons for this higher development.

Instead of building a single type of centrifugal and recommending it for every purpose "American" centrifugals are built in over fifty distinct types and every size of every type is carefully tested in our own complete hydraulical laboratory and its efficiency proved before it is permitted to leave our works.

It must meet our standard of efficiency before it is allowed to leave our works and that is what is making the American trademark famous in pumping machinery.

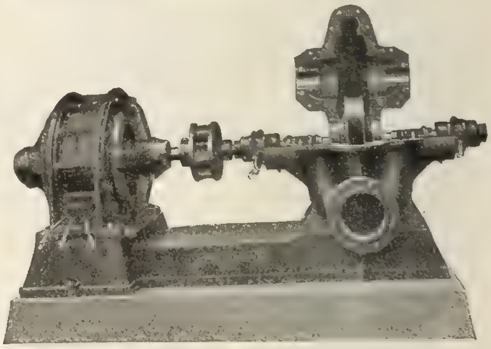


AMERICAN



"American" centrifugals attain up to 80 per cent. mechanical efficiencies and many of our specially designed pumps, installed according to our own specifications, show much higher efficiencies, enabling them to operate against high heads. We have many single stage centrifugals installed operating on over 200 feet heads.

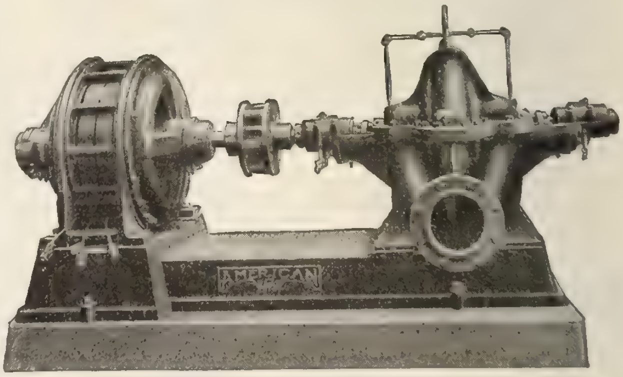
The low first cost of "American" centrifugals as compared with old style plunger pumps, combined with their high efficiencies, low cost for attendance and small cost for repairs make them **far more economical** than any other type of pump in nearly all conditions where **all costs are considered.**



Greatest economy in the end is the claim we make for "American" centrifugals and we are ready to prove that claim.

If you are interested in irrigation, write for our booklet, "Irrigation by Pumping" Bulletin No. 118.

Our General Centrifugal Pump Catalog No. 117 is the most complete ever issued. Write for it today.



The American Well Works

General Office and Works: Aurora, Ill., U. S. A.
Chicago Office: First National Bank Building

Canadian Sales Agency:
234 Craig Street West, Montreal
441 Seymour Street Vancouver, B.C.

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

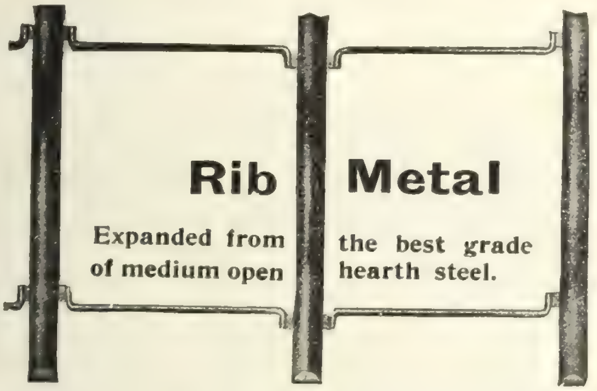
STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

KAHN SYSTEM

of Construction includes


Rib Metal
Expanded from of medium open
the best grade hearth steel.

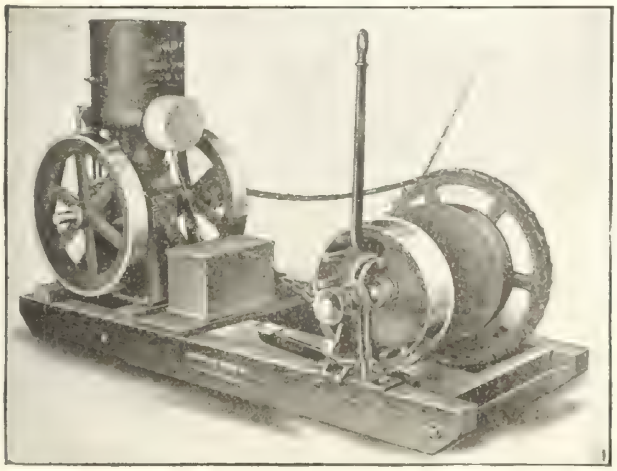
Supplied in sheets up to 18 ft. in length, width 16 ft. to 5 ft. 4 in. For reinforcing concrete floors, roofs, walls, cisterns, etc.

Other Products—**Kahn Truss Bars, Rib Bars, Hy-Rib, Trus-Con.** Chemical products for waterproofing and finishing concrete.

Trussed Concrete Steel Co.
of Canada, Limited
Head Offices and Works, Walkerville, Ont.

BRANCHES:
TORONTO—23 Jordan St. WINNIPEG—Union Bank Bldg.
MONTREAL—128 Coristine Bldg. VANCOUVER—52 Hutchinson Bldg.

DO YOU WANT A GOOD HOIST?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	**Mortar Conveying**	**Well Digging**
Bridge Building	**Sewer Building**	**Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists **London, Canada**

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES

Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President
Thos. C. Irving Jr., Vice-Pres.
Jas. W. [illegible], Secretary
Chas. W[illegible], Treas. & Mgr.

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, Canadian Express Bldg., Montreal, Que.
Branch Offices: Traders Bank Building, Toronto, Ont.
Norfolk House, Laurence Pountney Hill, London, E.C.

Note tremendous metal weight on this floor. Entire building of Alsen's Cement reinforced concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

for concrete reinforcement is made from high carbon, cold drawn wire. The process of cold drawing eliminates the possibility of flaws. Perfection Wire Mesh is necessarily perfect.

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

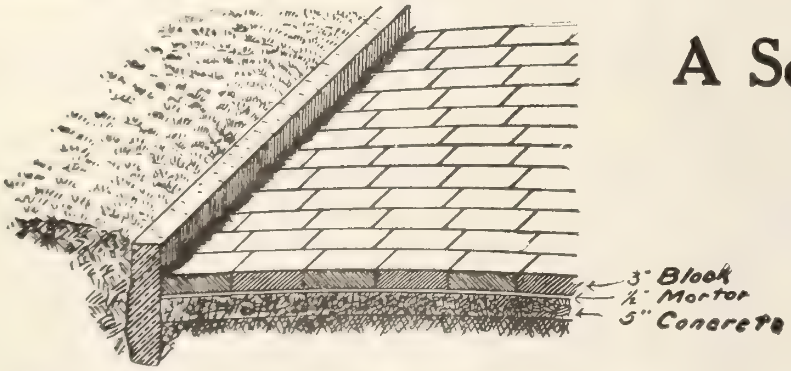
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Lap Welded Steel Pipe

MADE IN SIZES

12 to 72 inches Diameter

Used extensively for Water Supply for Mines, Mills, Hydraulic Operations and High Pressure Hydro Electric Installations.

Ask our Welded Pipe Dept. for prices.

American Spiral Pipe Works

MANUFACTURERS OF

SPIRAL RIVETED PIPE LAP WELDED PIPE
FORGED STEEL FLANGES

50 Church St. New York Box 485 Chicago, Ill.

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)

"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."

W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.
1032 Garfield Building, CLEVELAND, OHIO
SELLING AGENTS
The Dominion Equipment & Supply Co., Winnipeg, Canada

Guelph Hydrated Lime

Will **Save** You **$ $ $ $ $ $ $**

It is cheaper and better than lump lime—if it wasn't nobody would buy it.

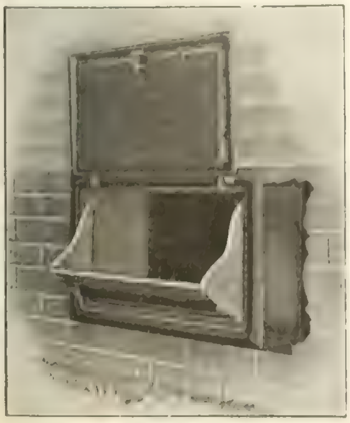
Cheaper because it goes farther, will not slack in air, keeps in any climate, saves time and is more easily handled.

Better because it makes whiter, stronger and denser plaster.

Specify **Guelph Hydrated Lime** when ordering from your dealer. You'll be surprised at the saving.

Standard White Lime Co.

Guelph, Ontario



EQUIP YOUR CELLAR

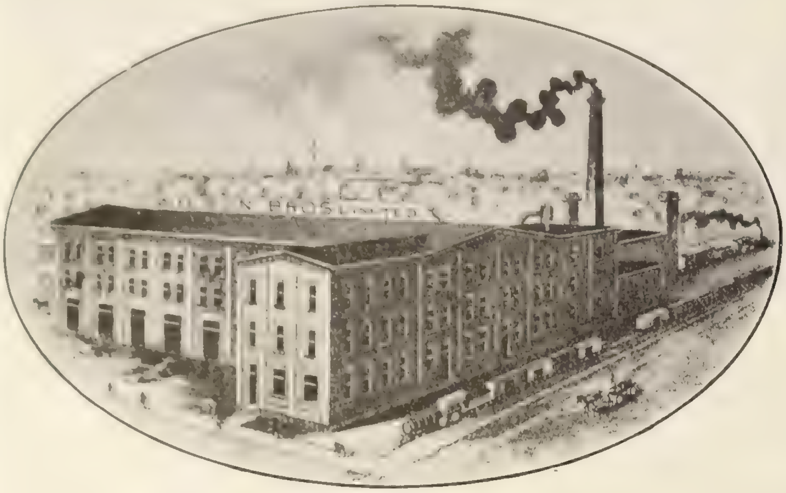
with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

Send for our [illegible]

The Down Draft Furnace Co., Limited

Galt, Ontario, Can.

Montreal Representative: E. F. Dartnell, No. 8 Beaver Hall Square.



Hardwood
Flooring
and
Interior
Finish

"WILSON BROS. LIMITED" on flooring means a carefully kiln dried and well manufactured article. Our flooring is straightened, hollow-backed, bored, end-matched, steel polished and bundled. -:- -:- -:-

We specialize in Veneered Doors to detail.

Wilson Bros. Limited **COLLINGWOOD, ONT.**

The
Mushroom
System

Of Reinforced Concrete is strong, economical and durable. Based on scientific principles, every pound of steel does the work it is designed to do.

The system is fully covered by broad patents in Canada, the United States, and all civilized foreign countries.

For lists of buildings, descriptive literature and estimates, address

C. A. P. Turner, M. Am. Soc. C. E.
816 Phœnix Building, Minneapolis, Minn.

IRON STAIRS

Dennis Wire & Iron Works Co.
Limited
London, Canada

Toronto Offices - 12 QUEEN STREET E.

Cut shows a Brown Hoist Locomotive Crane at work on the New York Catskill Aqueduct. This crane is doing the excavating; placing the forms; handling the concrete in tubs; and covering up, besides the other miscellaneous work. *Catalogues are sent on request.*

The Brown Hoisting Machinery Co.

Main Office and Works, CLEVELAND, OHIO.

THE QUESTION—

"What is the Best Roller for our Kind of Roadwork?"

is conclusively answered by the

WATEROUS Double Cylinder STEAM ROLLER

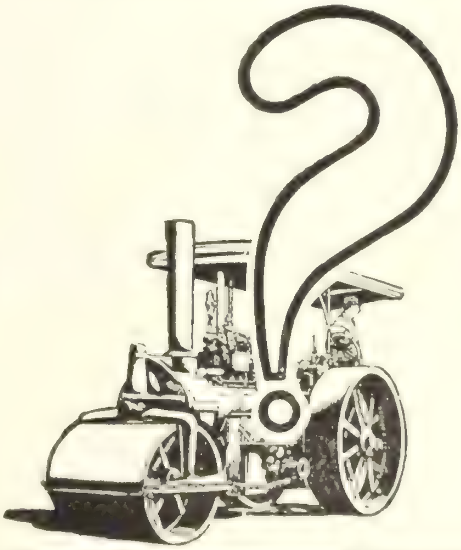
Over 100 Waterous Rollers are operating in Canada to-day. This means one at least in every province in the Dominion. Each one operating under entirely different conditions—on a different kind of road, using different material, in charge of men of widely different engineering ability. **And each one is making good.**

HERE'S WHY:—

The Waterous Roller carries a double-cylinder double crank engine, has cranks set on the quarter, which means full power at every part of the stroke,—*no dead centres. The Boiler* is of the locomotive type, a quick steady steamer—tested to 165 lbs. steam pressure. Provided with dumping grates and ash pan. Roller has a *two speed drive* for fast and slow work under full steam pressure.

All gearing *cut* from the *solid steel.*

Every part accessible and entirely controlled from the engineer's platform.



When you see a Waterous Roller at work ask the man who's in charge what he thinks of the machine—in the meantime write for our twenty page illustrated Booklet No. 301.

The
Waterous Engine Works Co.
Limited
Brantford, Canada

"Old Sol." Harnessed
BY
Luxfer Prisms

By a careful and scientific study of the requirements of store and warehouse lighting and by years of experience the "LUXFER PRISM" products have attained the highest degree of perfection.

With this system daylight is handled as though it were a stream of water and is delivered to dark basements and improperly lighted warehouses and stores.

Luxfer Prism Company,
100 King Street West - - Toronto

FILE YOUR PLANS
Free of charge at any of the four offices of the
"CONTRACT RECORD"

Contractors and manufacturers of building, municipal, railway, and power plant equipment not only expect to see your tenders advertised in the "Tenders' Department" of the "Contract Record," but they will also find it a great convenience if you place your plans and specifications on file at any or all of our four offiices, viz. Toronto, Montreal, Winnipeg and Vancouver.

Send along your next Tender Advt. together with Plans and Specifications

CONTRACT RECORD
220 King St. West, TORONTO

MONTREAL	WINNIPEG	VANCOUVER
Board of Trade Building	Travellers Building	Crowe & Wilson Chambers

COFFERDAMS
AND CONCRETE WORK

Cofferdam at Southampton : 40 feet x 12 feet, 14 feet deep.

We are experts at this work and before you close a contract, get our figures. We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

The Contractor's "Money Saver"

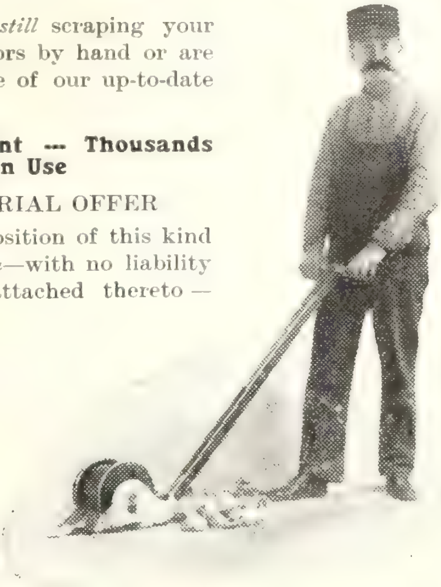
Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment — Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto—write us **to-day.**

MACHINE PAYS FOR ITSELF IN A FEW DAYS.



" Little Giant Floor Scraper "

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

MODERN CONTRACTORS' PLANT
THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18″ x 26″ cylinder Mogul, Standard Gauge, and 18-10″ x 14″ Vulcan and Davenport dinkeys, 36″ Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36″ Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8″ Keystone Drill and Boiler ; 2 Cyclone Drills.
HOISTS & DERRICKS	2 -Mundy and 3 -Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Waggons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag-Scrapers an 4—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2 Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36″ Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW
May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. and Dollard Lane - - MONTREAL, CANADA

Everything in Lumber for the Contractor

Fir, Hemlock, Spruce, Pine and Oak Timber and Lumber

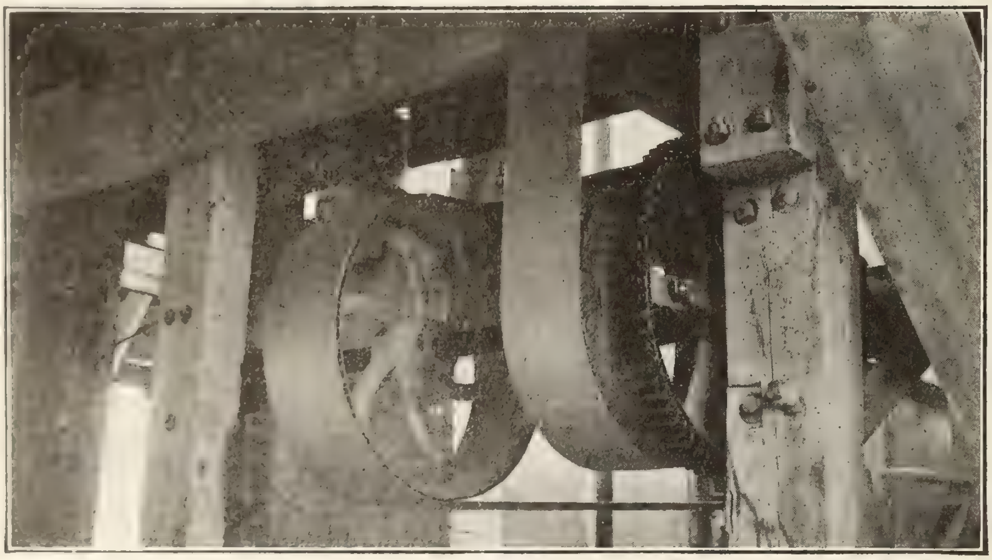
We specialize in

Southern Pine Timber and Piles

10,000 Green Tamarac Piles for Immediate Shipment. Get our Prices.

THE ELMITT LUMBER CO. LIMITED, OTTAWA, ONT.

SCANDINAVIA BELTING



These belts have been running exposed to the weather for two years.

They are giving excellent results.

We can give you a good belt and save you money.

FEDERAL ENGINEERING & SUPPLIES, LIMITED

Head Office, 284 Yonge Street, Toronto 329 St. James Street, Montreal

THE

Thames Quarry Co.

St. Mary's, Ont.

CRUSHED STONE

Rubble, Coursing and Dressed Stone

Lime Stone for Flux

JOHN BONIS, Manager

Office Phone 110a Res. Phone 110b

Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

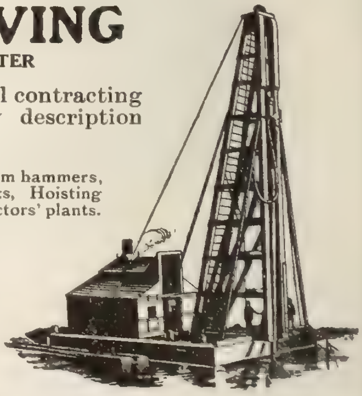
FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.



The

Missisquoi Marble Company

Limited

Canada's Pioneer and Leading Concern in the Marble Business

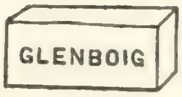
They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

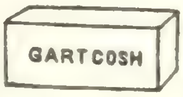
Eadie-Douglas, Ltd.	Toronto, Ont.
C. N. Barclay	Winnipeg Man.
Bosse & Banks	Quebec, Que.
General Contractors Supply Company, Ltd.	Halifax, N. S.
129 Sparks Street	Ottawa, Ont.
James Robertson Co. Ltd.	St. John, N. B.
G. R. Duncan	Fort William, Ont.
Walker & Barnes	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd.	Vancouver, B. C.
315 Coristine Building	Montreal, Que.

Do You Handle

Fire Brick



Every Glenboig Brick bears the brand



The undisputed supremacy of GLENBOIG FIRE-BRICKS make them the easiest to sell. There is a big demand for them.

"Glenboig Bricks" have stood the test of extreme heat without cracking; quick changes of temperature and without expanding or contracting.

GET OUR LITERATURE

MAKER'S SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another.

Tide Water Iron Works

HOBOKEN, N.J. U.S.A.

Come to Us If You Need

Hardwood Flooring
Interior Trim
Veneer Doors
Pine Doors
Stairs Frames
Sash, etc.

We manufacture the above from Select Stock : :

J. R. Eaton & Sons

Limited

Orillia, Ontario

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 604 605 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C.P.R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches.......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES

(Installed in Toronto).

Floor Tile—Ceramic, any color, ¼-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.
Floor Tile—½-inch square, 65 cents.
Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite, 55 cents per square foot.
Viterous Tile—All sizes, according to color, 55 to 65 cents.
Glazed—White, 6 x 3 inches, 55 cents per square foot.
Matt—Dull finish colors, first, 70 cents.
Capping Coves and Corners, special quotations to suit requirements.
Opalite Tile—3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.
White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

Standard compression work, 65 per cent.
High grade compression work, 60 per cent.
Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.
Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.
No. 4 compression bath cock ....net $1.65
No. 4½ Fuller's ....net 2.25
Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¼ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.
Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.
7 and 8-inch pipe, 50 per cent.
Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.
Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.
Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.
Binder stone, $1.30 per ton, f.o.b. Toronto.
Burnt River rubble stone delivered, $15 to $16 per toise.
Free stone delivered, $15 to $16 per toise.
Brown coursing stone, delivered, $3.25 to $3.50 per yard.
Grey coursing stone, delivered, $2.25 to $2.50 per yard.

PAINTS AND OILS

(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.
Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.
Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.
Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.
Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.
Turpentine, in barrels, 8cc per gallon.
Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.
Brown sills and heads, in the rough, delivered, 40 cents per foot.
Rubble stone in car lots, $1.30 per ton.
Scotch fire brick, delivered, $30 to $35 per M.
Steel channels and beams, $2.60 per 100 pounds. delivered f.o.b. Toronto.
Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.
Lime, per cwt., delivered, 38 cents.
Plaster of Paris, per barrel, delivered, $2.20.
Manilla Rope, best, per pound, 15 cents.
Expanded Metal, No. 10 gauge, 3½ cents per square foot.

AUTOMATIC SASH HOLDER

saves cord, weights, pulleys, and materials—no pockets—easier to install—for old and new windows. Send for sample and catalog to day. Agents wanted. Sold by the hardware trade or direct from 277 Broadway, New York.

Automatic Sash Holder Company

Bonds of Suretyship for Others and Employees in positions of trust.

Bonds Bid and Supply in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies

The
Guarantee Company of North America

The Pioneer Company *Established* [illegible]

Head Office - Montreal

Capital and Resources over - $1,965,000
Claims Paid over - - $2 263,000

No Claims in Dispute

This Company is not a party to any premium tariff combination

ARTIFICIAL STONE PAVEMENTS

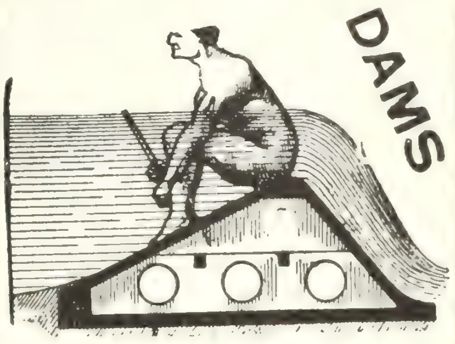
SIDEWALKS A SPECIALTY

CORPORATIONS will do well to consider our work and prices before letting contract

The Silica Barytic Stone Company of Ontario, Limited

WALTER MILLS
General Manager.

Head Office:
INGERSOLL, ONT.



AMBURSEN

Hydraulic Construction
Co. of Canada, Limited.

450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown

Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock

Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.

Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty

20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.

References Given

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge
Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway
Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge
and
Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS and CONTRACTORS

Water Washed Sand
Crushed Granite
Crushed Lime Stone

Prompt Attention Given Orders

Our Dock
Spadina Ave.

PHONES
Office - Adel. 1947
Yard - Adel. 1948

SAND & SUPPLIES, LIMITED
TORONTO

The
Phœnix Bridge & Iron Works
Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

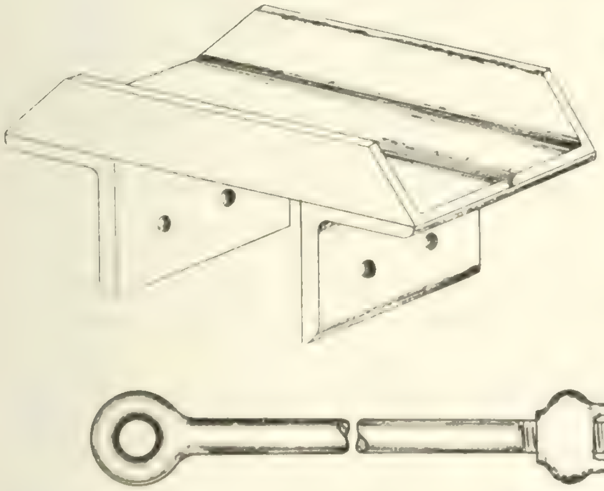
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

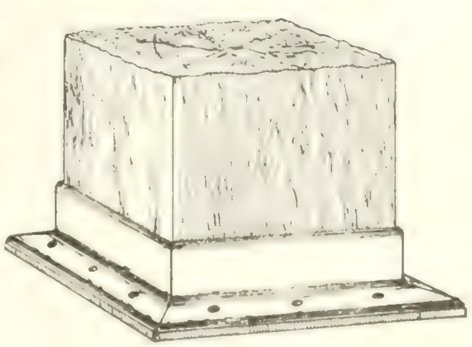
Wm. McNally & Co. - Montreal

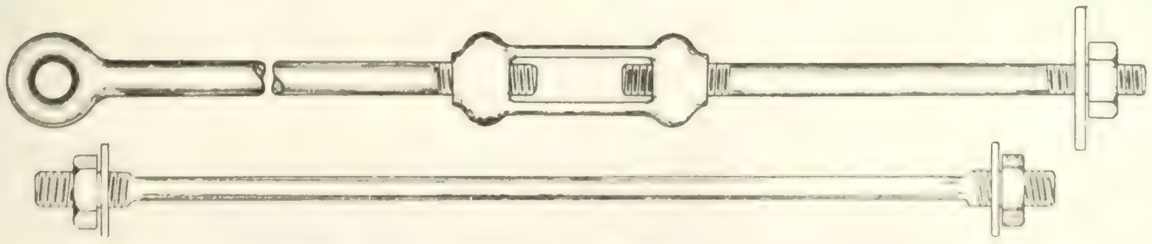
The Hamilton Bridge Works Company Limited

Hamilton, Canada



STEEL POST CAPS
and BASES
for Wooden Posts,
any size.
Also made in
Cast Iron





EYEBOLTS, TURNBUCKLES and RODS of all descriptions

Beams, Angles, Channels, Plates, any size from 1½ inch to 24 inches, and any length up to 70 feet

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF
GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE
FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins
Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President. J. G. Allan Vice-President. James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The Roofers Supply Co. Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridge's Bay, TORONTO

John Whitehead & Co.

LIMITED

Albert Works: PRESTON, ENGLAND

Makers of

Reliable

Efficient

Tile and Pipe Machinery, and

CLAY WORKING PLANT

for all classes of Clays and Shales.

INQUIRIES SOLICITED. CATALOGUES POST FREE.

Established over 75 years. TELEGRAMS: Brictile, Preston

Representatives in Canada:—Messrs. Chambers & Simpson, Engineers, Toronto

---

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

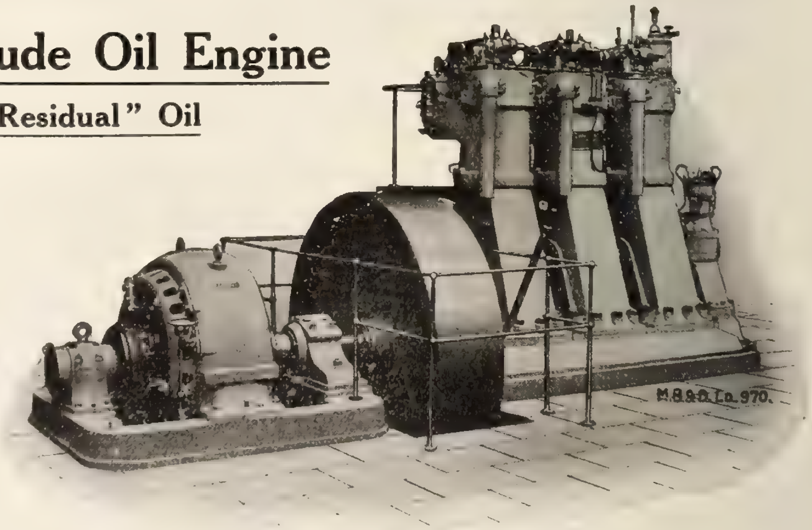
Suitable for Public and Private Buildings

The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear
No Producer
No Chimney
No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdowns
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses



HIGH SPEED **SLOW SPEED**

35 to 1000 B. H. P.

The Des Moines Hemispherical Bottom Steel Tanks and Towers

have been used and approved by nearly all leading Engineers. They are undoubtedly the most economical means of storing water at an elevation.

We have built many of these in Canada the United States and Mexico. Estimates cheerfully furnished.

Send for Catalog No. 15

Des Moines Bridge & Iron Co.

Pittsburg, Pa., U.S.A., 945 Curry Bldg.
Des Moines, Iowa, U.S.A. 938 Tuttle St.

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A.

Tiffin Flushers, Sprinklers, Dump Wagons

Garbage, Street Cleaning Carts and Municipal Devices

The Most Complete and Perfect Line Made in the United States

THE TIFFIN WAGON CO.
Tiffin, Ohio

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue Hunter Buff and Blue Oolitic Limestone

Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange

Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

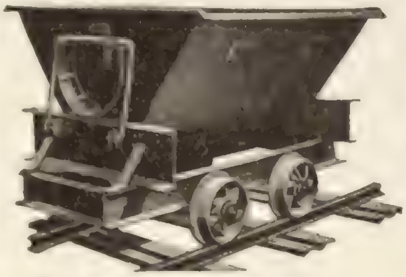
Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.



CARS - BUCKETS - SCREENS

If you require any equipment send for our Catalog No. 31-A which illustrates a complete line of this material.

We make any kind of Car or Bucket you want for handling concrete—clay—stone—cement blocks—or anything else.

Carry Standard Sizes in Stock

Write us we can save you money

High Quality
Low Prices
Quick Shipments

SACKETT - CHICAGO

1691 Elston Ave., Chicago, Il

We are in the Cement Concrete

Culvert and Sewer Pipe

Business

Have Been Building

Concrete Pipes

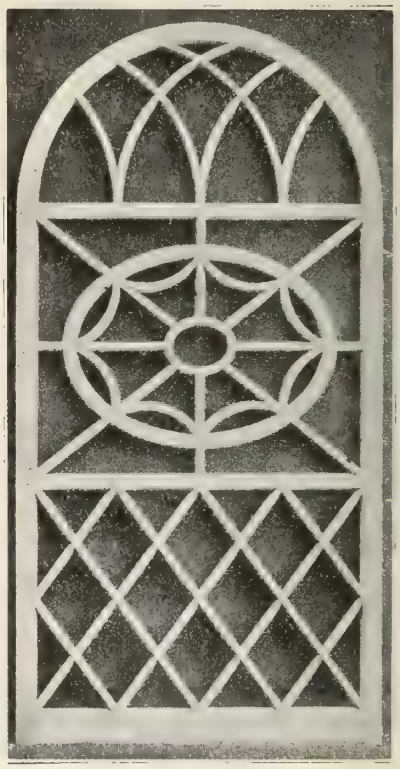
For Twenty Years.

Our quality is the highest. Our prices the lowest. Sizes 6 to 45 inches (REINFORCED.)

Railways and Corporations are amongst our satisfied customers.

Write us your wants—we do the rest.

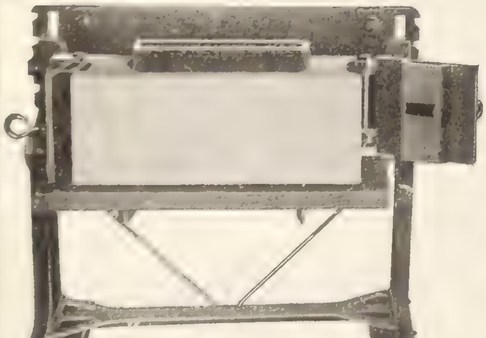
Ebenezer North Co.
LONDON, ONTARIO



Diamond Sash

particularly suited for Gothic and Queen Ann style windows. It is impossible to successfully manufacture these sash without the proper machinery, but we have it. Every light is uniform, the joints are perfect and all the lines are absolutely straight where they should be and uniformly curved in the curved parts;

M. Brennen & Sons Mfg. Co., Ltd.
HAMILTON, ONTARIO



Improved Singer No. 4
Block Machine

Our catalogue R. with ful information and free on request

It Makes

Face Down Blocks

Blocks 4", 6", 8" 10" 12", 16" and 20" long. 4", 6", 8", 10" and 12" wide.

All Blocks on One-size Pallet.

Sold in combination to suit purchaser at reasonable prices. Guaranteed against defective material or poor workmanship.

Vining Mfg. Co.
Niagara Falls, Ont.

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO
Branches: Vancouver and Winnipeg
Montreal

When you think of Metal Ceilings think of GALT

A Contractor needs our Metal Ceilings—Because they can be erected

By ANY Carpenter
At ANY Time of the Year
In ANY Kind of Weather

Plans, Instructions, Wood Bracket and Nails Furnished Free.

Get Catalogue A-3

THE GALT ART METAL CO., LIMITED
GALT, ONTARIO

Municipal Contracts Should be Let at the Lowest Possible Figure

You cannot secure low bids unless you place your proposition before a large number of contractors. The larger the number, the greater the competition and consequent saving on your contract.

More contractors look for proposed work in the

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building Contracting Engineering Public Works
Municipal Progress Advance Information

than in any other publication. A moderate expenditure in the advertising of proposals will convince you of the service that the CONTRACT RECORD can give you. When you have "Tender" advertising to place do not forget that this paper carries more advertising of this sort than any other journal. CONTRACT RECORD, 220 King St. West, Toronto.

The Smith Marble and Construction Co., Ltd.

Montreal

Office & Factory:
145 Van Horn Ave.

Show Rooms:
458 Bleury Street

Importers, Manufacturers, Contractors

OF

Interior and Exterior Marble, Slate, Floor and Wall Tiles, Mosaics, Plumers and Electrical Marble, Granites for Building and Monumental Work.

THE CEMENT ERA—A monthly trade journal of merit. Devoted to the concrete and cement industry. Is carefully edited in the interest of the trade. Covers the following subjects: Reinforced Concrete Building, Cement Block Manufacturing, Tile Making, Concrete Paving, Ornamental Cement Work, Waterproofing, Fireproofing, etc. $1.50 a year. Send for sample.

CEMENT PIPE AND TILE—By E. S. Hanson. A cloth bound book which fully treats the subject of manufacturing cement pipe and tile, its uses, cost of production, etc. Its author is recognized as the leading authority on this subject. Price $1.00 a copy, delivered.

DIRECTORY OF PORTLAND CEMENT MANUFACTURERS together with manufacturers of Gypsum and Lime. The only directory of its kind. Gives a full list of the companies, their officers, capacity of plants, capitalization, process of burning, etc. Price $1.00 a copy, delivered.

The Cement Era Publishing Co.
1200-1210 Morton Bldg. - CHICAGO, ILL.

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, **Toronto**

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, **Ottawa**

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street East, **MONTREAL**

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.

A. M. Can. Soc. C. E. A. M. Am. Soc. C. E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

H. J. GLAUBITZ, C. E.

Consulting Engineer

Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work

1103 TEMPLE BLDG., TORONTO

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 413, Pacific Block, **Vancouver, B. C.**

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { **Waterworks, Sewerage and Electric Lighting.**

Winnipeg and Calgary

John Haddin E. L. Miles

Allan Keefer

Architect

Ottawa, Ontario

Arthur L. Weeks

Architect

Canada Life Building, Ottawa

Reinforced concrete and steel structures, factories and commercial buildings

NADEL & ADLER

375 St. James St., MONTREAL

The largest Labor Contractors in Canada. If you are in need of Labor, write, wire or phone for particulars, Main 5491, Night calls, Main 15 or St. Louis 2204.

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

TRADE MARK
TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes. "Roman" building stone. "Milton" pressed bricks. Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. **Montreal**

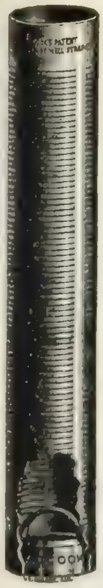
Bell Tel. M. 4354

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

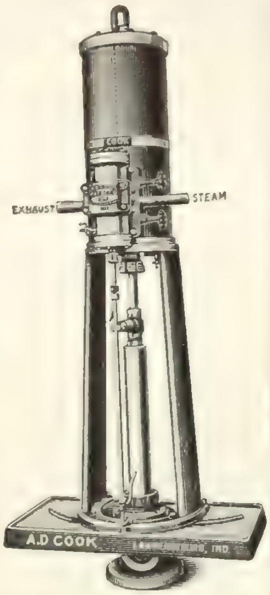
58 Front Street W., TORONTO



Water Supply from Deep Wells

is obtained at a minimum cost by use of our deep well pumps.

Write for Bulletin 26 explaining the use of Cook's Patent Brass Tube Well Strainer.



A. D. COOK

Lawrenceburg, Indiana, U. S. A.

Manufacturer of a Complete line of **DEEP WELL SUPPLIES** including Steam, Belt and Motor Driven **DEEP WELL PUMPS**, Wind-mill and Hand Pumps, Working Barrels and Valves, Pump Rods and Pump Rod Joints, Drill Rods and Drill Rod Joints, Drilling and Well Tools.

CATALOGUE MAILED UPON REQUEST.

PURE WATER

It is easy to obtain with our plants and apparatus

We design and contract for complete municipal filtration plants of any capacity.

We supply and install apparatus for sterilizing water supplies by the application of calcium hypochlorite.

Literature, Sketches, Estimates and Recommendations Supplied on Request

American Water Softener Co.

1001 Chestnut St., PHILADELPHIA, Pa.

We have no affiliations or working acquirements with any of our competitors.

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILE, CRESTINGS, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor

Montreal Agent: E. F. DARTNELL, 157 St. James St. **Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade**

Victoria Ave., Westmount, Quebec. "The Tarvia Modern Pavement."

SEND FOR NEW BOOKLET

We have recently issued a new and beautifully illustrated booklet, detailing the experience of many town authorities and engineers with Tarvia.

It shows how in one case after another Tarvia was first tried on experimental strips, frequently in competition with other materials. Then after the experience of a year or so, all other dust layers and road binders were discarded and Tarvia was used more and more extensively.

Some engineers have adopted the broad policy of using Tarvia in all *new* macadam construction. Many road authorities go still further and aim to treat all the old macadam roadways with Tarvia to preserve them against the destructive effect of automobile traffic and prevent dust.

We want property owners to know that a dusty road is not merely a nuisance to them but is an endless burden upon them as taxpayers,—because dust means that the macadam is pulverizing and the surface blowing away.

We want property owners to realize that the road authorities of their town can give them comparatively dustless macadam roads at little or no extra cost.

We want road engineers to realize that they can reduce their maintenance costs by bonding their roads with Tarvia, and that the saving in maintenance will generally pay for the Tarvia application.

We therefore urge everyone interested to send for our booklet to nearest office.

The Paterson Manufacturing Co. Limited, Montreal, Toronto Winnipeg Vancouver
The Carritte-Paterson Manufacturing Co., Limited St. John, N. B. Halifax, N. S.

Canada Wire & Cable Co., Ltd.

Announce the Opening of their New

Wire, Cable, and Wire Rope Works

at Toronto

The Product of our Electrical Wire Department will include

Electrical Wires and Cables

in Aluminum and Copper

BARE AND INSULATED—FOR ALL PURPOSES.
GALVANIZED IRON TELEGRAPH AND TELEPHONE WIRE

The Product of our Wire Rope Department will include:

- Standard Hoisting Ropes
- Semi-Pliable, Pliable and Extra Pliable Ropes
- Improved Patented Crucible Cast Steel Hoisting Ropes
- Improved Mild Steel (Siemens-Martin) Elevator Ropes
- Transmission and Colliery Ropes
- Tiller Ropes
- Galvanized Steel Hausers
- Galvanized Strand 2, 3 and 7 wire for Guys
- Ropes to any Standard Specification

Literature ready for distribution at an early date. Write for it

CANADA WIRE & CABLE CO.

LIMITED

Factory at
1160-70 Dundas Street
Toronto

HEAD OFFICE
KENT BUILDING, 156 YONGE STREET,
TORONTO

"HUBER" ROAD ROLLERS

for all kinds of contract work for plowing and for hauling

Built for the Contractor, and peculiarly adapted to his work. Makes the Contractor independent of animal power, and greatly reduces the number of men on the pay-roll.

Runs backward or forward equally well. Finest power for pulling stone or dirt wagons; and hauls them in trains easily. Hitch it to the largest graders, and it pulls them right along without trouble.

When it comes to pulling rooter ploughs, there is nothing better. The hardest kind of a street or road is easy work for this engine, if you can get a plow strong enough to stand up to the work.

Outfit is guided by power steering attachment. Nothing finer could be devised. Just a light touch of the hand on steering lever is all that is required. The engine furnishes the power to steer itself.

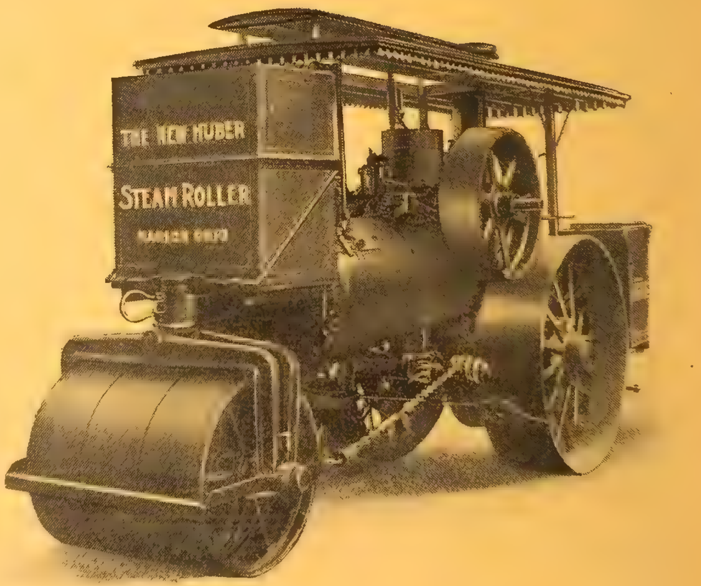
Our twin cylinder machine runs the smoothest of any traction engine built. Details and specifications are given in our special catalog for Contractors' sent on request

Supplied with Single or Double Cylinders

10 and 14 ton sizes

Let us submit proposal.

We can now offer a special outfit which we call the Contractor Engine. Not only was a Traction Engine required but the contractor must also have a road roller. These machines are costly? Why buy two, an engine and a roller? Why not build two in one? This we have done, and we are able to offer a high-class traction engine and road roller in one outfit, and at but little more than what either alone would cost of any other style.



F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.

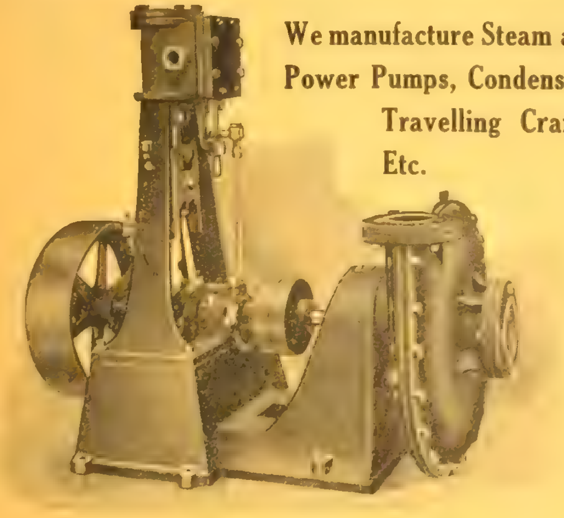
GORMAN, CLANCEY & GRINDLEY, LTD., Calgary and Edmonton Agents

Vol. 25 Toronto, August 9, 1911 No. 32

Contract Record

ESTABLISHED 1886

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information



We manufacture Steam and Power Pumps, Condensers, Travelling Cranes, Etc.

Write for Catalogue

The Smart-Turner Machine Company
HAMILTON, ONTARIO Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: 91 to 133 Don Roadway
TORONTO

High Speed
Portable

COMPRESSORS

Page
28

Canadian RAND Co., Ltd.
Commercial Union Bldg., Montreal, Can.

Continuous and Machine Banded Wood Stave

WATER PIPE

RESERVOIR TANKS

for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

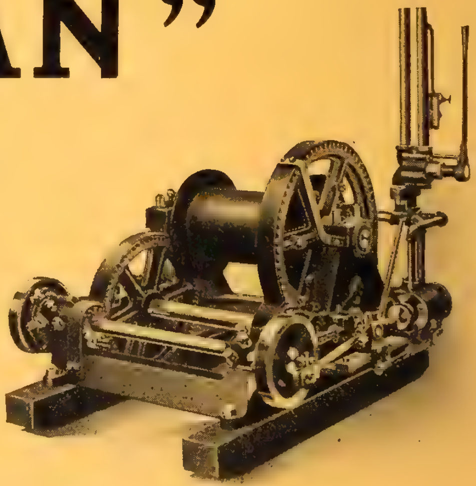
The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

"AMERICAN" Slewing Engine



Write TO-DAY for full information regarding the LATEST IMPROVED, MOST POWERFUL, SMOOTHEST RUNNING, CHEAPEST TO MAINTAIN Slewing Engine on the market.

Name

Address

Please send information and prices on "AMERICAN" Slewing Engine.
AMERICAN HOIST & DERRICK CO.
St. Paul, Min.
C. R. 8/9/11

American Hoist & Derrick Company

ST. PAUL, U.S.A.

Gorman, Clancey & Grindley	Edmonton and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot, Ltd.	Vancouver, B.C.
J. L. Neilson & Co.	Winnipeg, Man.
Dunn Brothers	Winnipeg, Man.
J. A. McTaggert	Winnipeg, Man.

More and more frequently Canada Cement is being named in specifications because Builders and Architects keep these facts in mind

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

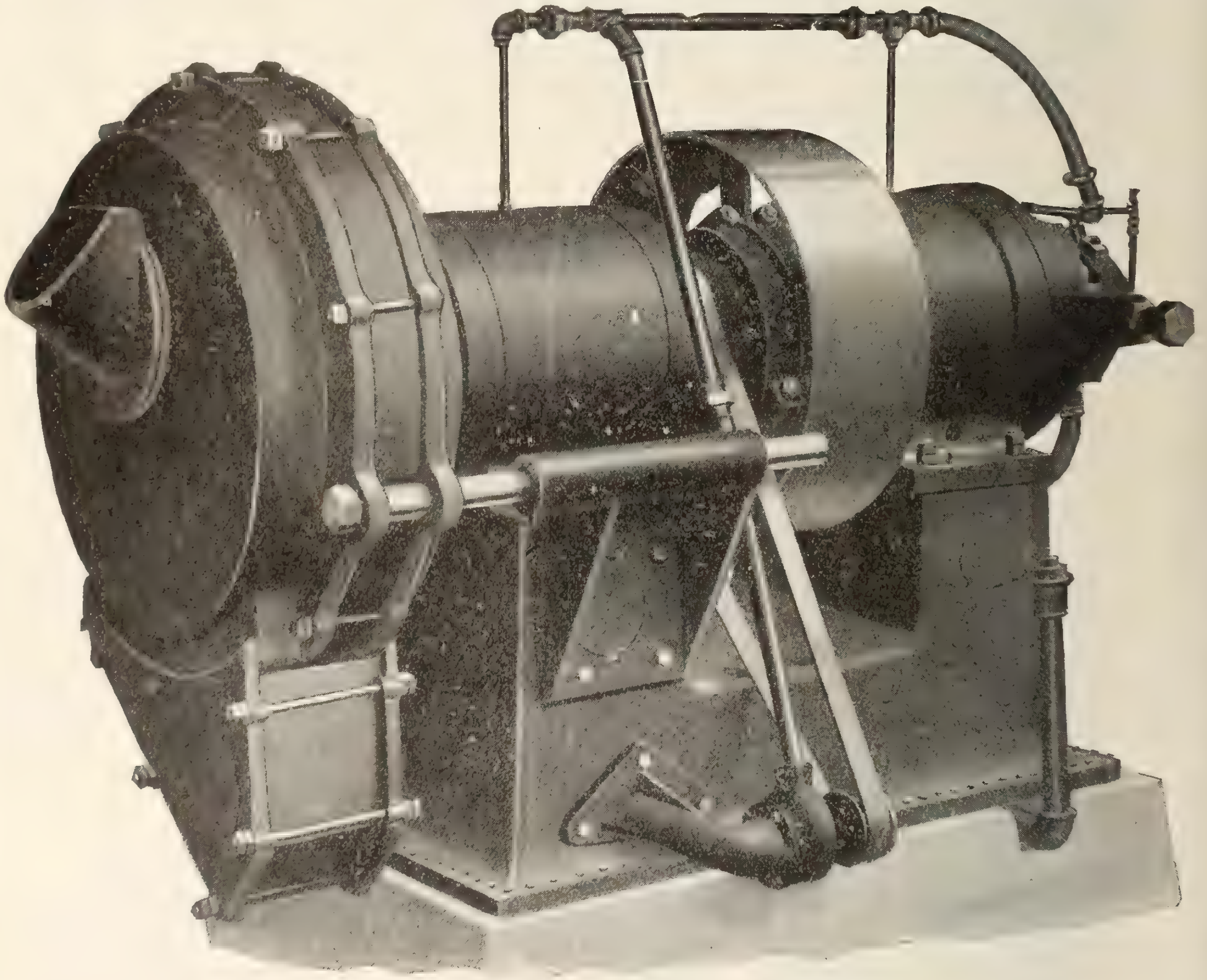
CANADA CEMENT COMPANY LIMITED
PORTLAND
CANADA
CEMENT
MONTREAL

Canada Cement Company, Ltd.

MONTREAL - TORONTO - WINNIPEG - CALGARY

Symons
Disc Crushers

AN ENTIRELY NEW PRINCIPLE WHICH HAS MADE A SUCCESS



SEND FOR LITERATURE AND PRICES

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

The Symons

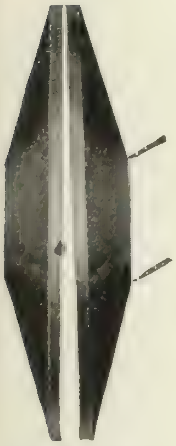
Disc Crusher

is the only crusher which will take rejections, screened or unscreened, from standard gyratory crushers and reduce same rapidly at one operation to ¾-inch size and less.

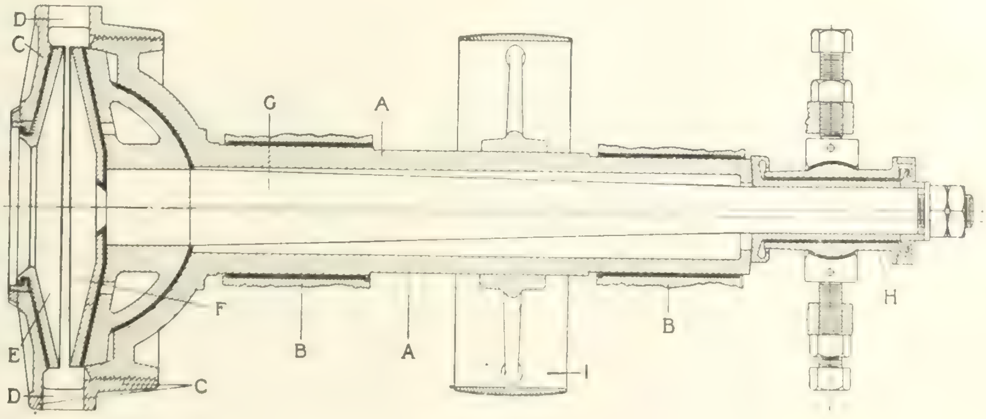
is the only crusher which successfully reduces wet or dry gravel boulders mixed with sand, to smaller product.

is the only crusher which can be quickly adjusted to make any standard size of product desired between three inches and 5-16 inch.

is the only crusher which spreads the stone while crushing it from a central feed opening, thereby avoiding conjestion and choking.



Crushing Discs



Sectional View

Note
the
Enormous
Capacity
per day

40 Tons of ¼-inch
TO
500 Tons of 2½-inch

Size of Crusher......	48-in.	36-in.	24-in.	18-in.	13-in.
Approx. Shipping wt...	30,000	19,000	8,500	5,600	3,000
Opening in Elliptical Feed Spout	11¼ x 17	9¾x14½	7x10½	4¼x7	4x4¾
Opening between discs at feet Spout.........	8-in.	5-in.	3¼-in.	2¼-in	1¾-in.
Min. exit opening for best results	1-in.	¾-in.	½-in.	⅜-in.	¼-in.
Cap. in tons per hour..	Size of Ring Tons per Hour 1 = 45-60 1¼ = 60-75 2 = 75-80 2½ = 85-100	Size of Ring Tons per Hour ¾ = 25-30 1 = 30-40 1½ = 40-50 2 = 50-60	Size of Ring Tons per Hour ½ = 12-15 ¾ = 18-20 1 = 20.25 1¼ = 25-30	Size of Ring Tons per Hour ⅜ = 5-8 ½ — 8-10 ¾ - 10-12 1 = 12-15	Size of Ring Tons per Hour ¼ - 4-5 ⅜ = 5-7 ½ = 6-8 ¾ = 8-10
R.P.M. Main Pulley....	100	133	150	200	300
R.P.M. Eccentric Pulley	200	266	400	450	600
Size of Pulleys.	54 x 16	44x14	34x10	28x8	20 x 6
H.P. required.........	50 - 65	30-40	18-25	12-18	10-15

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects
Page
Keeler, Alan 92
Weeks, Arthur L 92

Architectural Iron Work
Canada Wire Goods Mfg. Co. 73
Dennis Wire & Iron Works 71
Meadows Co., Geo. B 35

Air Compressors
Escher Wyss & Co. 33

Air Valves, Automatic
Marsh, J. P. 82

Asphalt Plant
East Iron Machine Co. 73

Buckets
American Hoist & Derrick Co. 2
Sackett Screen & Shute Co.

Belting
Federal Engineering & Supplies, Ltd 80

Brick Chimneys
Heinicke, H. R 70

Blowers
Sturtevant Co., B. F. 73

Boilers
Inglis, John 67
Jenckes Machine Co. 2
Leonard & Sons, E 73
Marsh & Henthorn 71
McDougall Caledonian Iron Works 69
Mussens Limited 4
Waterous Engine Works Co. 77

Brick Machinery and Supplies
Berg Mfg. Co. 30
Wert C. S. 10
Whitehead, John

Brick
American Enamelled Brick Co.
Don Valley Brick Works 7
Hamilton Pressed Brick Co 17
Milton Pressed Brick Co
Port Credit Pressed Brick Co. 86
Toronto Pressed Brick Co.

Brickmaker's Supplies
Sackett Screen & Shute Co.

Bridges (Steel)
Attica Bridge Co. 88
Canadian Bridge Co 84
Cleveland Bridge Co. 84
Des Moines Bridge and Iron Co. 89
Dickson Bridge Works 89
Dominion Bridge Co 84
Hunter Bridge and Boiler Works 79
National Bridge Co. 89
Phoenix Bridge and Iron Works 85
Pennsylvania Steel Co. 84

Cement
Alsen Portland Cement Co 74
Britnell & Co 80
Bremner, Alex 87
Canada Cement Co 3
McNally & Co., W. 85
Morrison & Co., T.A. 92
Rogers, Alfred Limited 9

Concrete Pipe
Dominion Concrete Co. 22
Lock Joint Pipe Co.

Cement Waterproofing
Ceresit Waterproofing Co. 18
C[illegible]as-Black 19
Hercules Waterproofing Cement Co 88
Mansbendel, F. P 31

Cranes, Travelling & Locomotive
Page
American Hoist & Derrick Co. 2
Armstrong, H. J. 70
Brown Hoisting Machinery Co. 77
Males Co 64
Parker, S. E 20
Willis Shaw Machinery Co 64

Conduits
Conduits Co., Limited 87

Crushed Stone and Granite
Sand and Supplies 85

Concrete Mixers and Machinery
Canada Foundry Co 20
Chain Belt Co. 27
General Machinery Co.
Gould, Shapley & Muir 16
Hopkins & Co., F., H. 96
Ideal Concrete Machinery Co.
Jenckes Machine Co. 2
London Concrete Machinery Co. 35
Milwaukee Mixer Co. 16
Mussens Limited 4
Morrison & Co., T. A. 92
Richert Mfg. Co. 25
Steel and Radiation (Cement Gun) 23
Standard Scale
Vining Bros.
Wettlaufer Bros.
Wert C. S. 1

Contractors' Plant
American Hoist & Derrick Co. 2
Acme Eqpt. & Engineering Co. 75
Beatty & Sons, M. 6
Hepburn, John T. 12
H. & E. Lifting Jack Co. 71
Hopkins & Co., F.H. 96
International Marine Signal Co. 8
Willis Shaw Machinery Co. 64
Marsh & Henthorn 71
Montreal Locomotive Works 32
Mussens Limited 4
Parker, S. E. 20
Richert Mfg. Co. 25
Ritchie Contractors Supply Co. 78
Tiffin Wagon Co.
Troy Wagon Works 34
Watson Wagon Co. 34
Wert C. S. 10

Crushers (Stone and Rock)
Berg Machinery Co 30
Hopkins & Co., F. H. 96
Jenckes Machine Co. 2
London Concrete Machinery Co. 35
Males Co 64
Mussens Limited 4
Morrison & Co., T. A 92
Willis Shaw Machinery Co. 64

Corrugated Iron
Galt Art Metal Co.
Metallic Roofing Co. 71
Metal Shingle and Siding Co.
Ormsby, A. B., Limited 11
Roofers Supply Co. 87

Contractors
Bennett, Robt. 71
Foundation Co 93
Holmes, Fred. 70
McIlwraith, Jas. A. 83
Nadel & Adler 92
Wells & Gray 90

Coal Handling Apparatus
American Hoist & Derrick Co. 2
Down Draft Furnace Co. 75
Parker, S. E. 20

Derricks and Derrick Fittings
American Hoist & Derrick Co. 2
Parker, S. E. 20

Drills
Page
Beatty & Sons M 6
Canadian Rand Co. 28

Drilling Contractors
Harvey, J. 83

Dredges
Beatty & Sons, M 6
Males Co. 64
Willis Shaw Machinery Co 64

Dry Kilns
Sturtevant Co., B. F.

Electrical Apparatus, Motors
Canada Ford Co.

Engines
Canadian Boving Co.
Inglis, John 67
Jenckes Machine Co. 2
Leonard & Sons, E 73
Mussens Limited 4
Sturtevant Co., B. F. 73
Waterous Engine Works Co. 77

Engineers (Civil) and Mechanical
Barber & Young 92
Chipman & Power 92
Bowman & Connor 92
Farmer, John T. 92
Fuce, Edw. O. 92
Galt Engineering Co., John 92
Glaubitz, H. J 92
Hancock, H. Syd. 92
Inglis, John 67
Kennedy, Jas. C. 92
Lea & Ferguson 92
Mace, T. Harry 92
Mitchell, C. H. 92
McRae, John B. 92
Moore & Scollan 92
Taylor, James 92

Exhaust Heads
Sturtevant Co., B. F.

Filters
American Water Softener Co.

Floor Scrapers
Hurley Machine Co. 79

Friction Clutches
Berg Machinery Co 30

Field Instruments
Consolidated Optical Co
Gurley, W. & L. E. 70

Fire Brick
Gibb, Alexander 81

Fire Apparatus
Morrison & Co T. A. 92
Seagrave, W E. 80

Fireproof Doors and Windows
Douglas Bros. 76
Mussens Limited 4
Ormsby, A. B. 11
Steel and Radiation 23

Gauges, Steam, etc.
Marsh, Jas. P 82

Granite and Marble
Laurentian Granite Co 83
Missisquoi Marble Co 81
Smith Marble & Construction Co.

Glass
Page
Consolidated Plate Glass Co.
Luxfer Prism Co
Toronto Plate Glass Importing Co. 68

Hoists (Hand Gasoline and Electric)
Parker, S. E 20

Heating Apparatus
Jenckes Machine Co. 2
Leonard & Sons, E. 73
Steel and Radiation 23

Hoisting Machinery
American Hoist & Derrick Co. 2
Beatty & Sons, M. 6
Canada Ford Co.
Inglis, John 67
Jenckes Machine Co. 2
Hopkins & Co., F. H. 96
London Gas Power Co. 73
Marsh & Henthorn 71
Mussens Limited 4
Parker, S. E. 20
Sturtevant Co., B F. 33

High Pressure Pipe Lines
Escher Wyss & Co 33

Hydrants
Canada Iron Corporation 87
Gartshore-Thomson Pipe Co. 86
Kerr Engine Co.

Interior Finish and Doors
Anglin, S. 74
Brennen & Sons, M.
Batts Limited 91
Canada Office & School Furniture Co
DeLaplante, Ltd. 81
Bryan Mfg. Co. 35
Eaton & Sons, J. R. 81
Elmitt Lumber Co. 80
Georgian Bay Shook Mills 90
Rhodes Curry & Co.
Wilson Bros.

Locomotives
Montreal Locomotive Works 32

Metal Form for Concrete
Reichert Mfg. Co. 25

Lime
Christie, Henderson & Co. 82
Jamieson Lime Co. 76
Ontario Lime Association 91
Standard White Lime Co 75

Metal Lath
Galt Art Metal
Metallic Roofing Co. 71
Noble C. W. 74
Steel and Radiation 23

Meters
Hopkins & Co., F. H. 96
McDougall Caledonian Iron Works 69
Neptune Meter Co.

Paving and Paving Materials
Dominion Carbolineum Works
Metropolitan Paving Brick Co.
Ontario Asphalt Block Co. 74
Shawmut Paving Brick Co. 72
Silica Barytic Stone Co. of Ontario 83

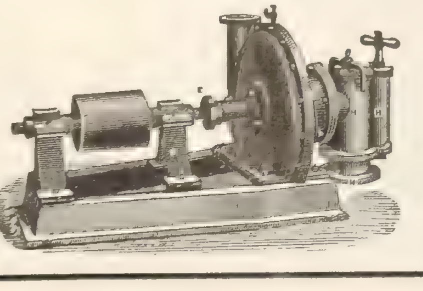
(Continued on page 10)

M. Beatty & Sons, Limited

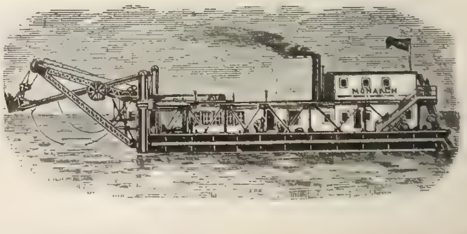
Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels

Steel Dump and Deck Scows



Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Engineers and Builders

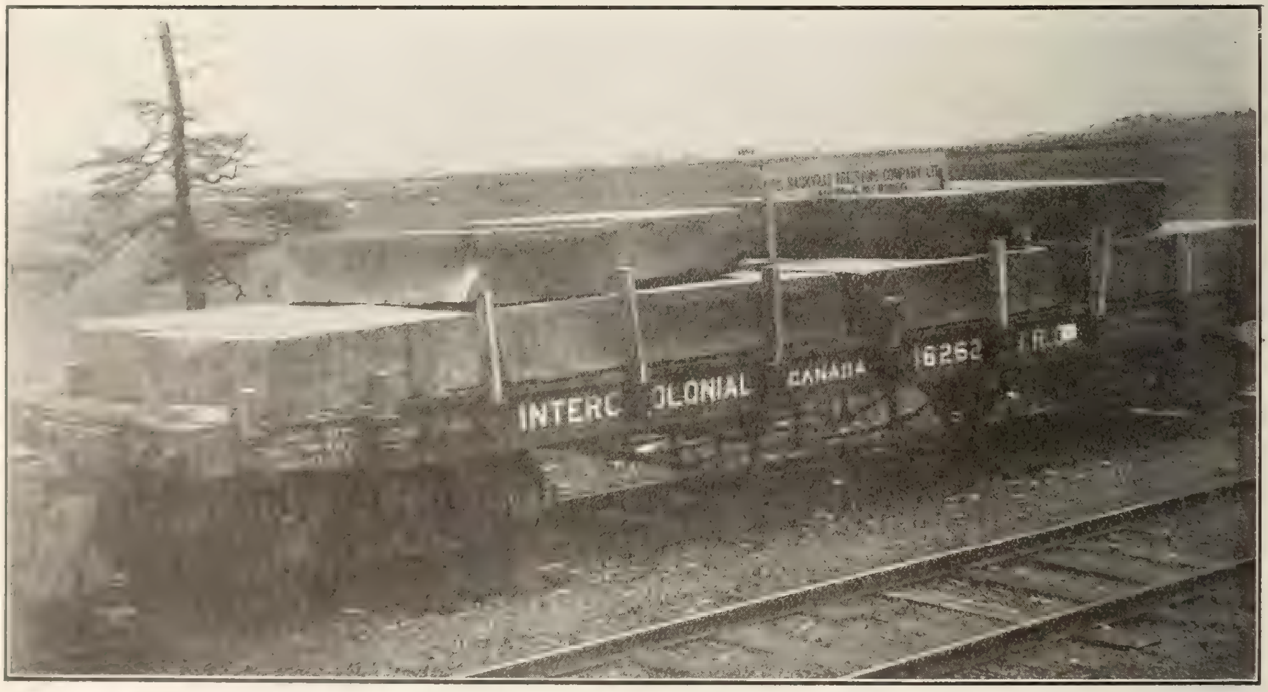
OF ALL

Steel and Iron Structures

Mill Buildings our Specialty. Roofs, Bridges, Columns and Girders of Every Description. Large Stock of Structural Shapes always on hand for immediate shipment. Ask for Designs and Estimates on your Work.

International Marine Signal Company Limited

OTTAWA, CANADA



Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Page
[illegible] Mfg. Co.	[illegible]
[illegible] & Co.	82
[illegible] H. W.	80

Portable Saw

Canadian Fairbanks	[illegible]

Pipe

American Spiral Pipe Works	75
Canadian Pipe Co	80
Dominion Wood Pipe Co	12
[illegible] Concrete Co	22
Gartshore-Thomson Pipe Co.	80
Lock Joint Pipe Co	
[illegible] & Co.	11
National Iron Works	87
Pacific Coast Pipe Co.	1
[illegible]	
Steel Co. of Canada	19
Steel and Radiation	23

Plumbers' Supplies

Standard Ideal Co.	36

Power Engines

Inglis Co., John	67

Paints and Varnishes

Paterson Mfg. Co.	94

Pile Driving Machinery

American Hoist & Derrick Co.	2
[illegible] Construction Co.	80

Pumps and Pumping Machinery

American Well Works	
Beatty & Sons, M.	6
Cook, A. D	
Escher Wyss & Co.	33
Hopkins & Co., F. H.	96
Inglis Co., John	67
Leonard & Sons, E	73
McDougall Caledonian Iron Works	69
Mussens Limited	4
Ontario Wind Engine & Pump Co.	
Smart-Turner Machine Co.	1
Waterous Engine Works Co	77

Roofing Materials

	Page
Asbestos Mfg. Co.	24
Galt Art Metal Co.	
Metallic Roofing Co.	71
Metal Shingle & Siding Co.	33
Noble, Clarence W	74
Paterson Mfg. Co.	94
Philip Carey Co.	71
Roofers Supply Co.	87
Standard Paint Co.	

Railway Supplies

Gartshore, John J.	92
Hopkins & Co., F. H.	96
Mussens Limited	4

Reinforcements. Concrete and Steel

Ambursen Hydraulic Construct'n Co.	83
Canada Wire Goods Mfg. Co.	72
Steel Co. of Canada	19
Steel & Radiation	23
Trussed Concrete Steel Co.	73
Turner, C. A. P.	

Road Machinery

Hamilton Machinery Co.	15
Morrison & Co., T. A	92
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co.	20
Hopkins & Co., F. H	96
Montreal Locomotive Works	32
Mussens Limited	4
Males Co.	64
Willis Shaw Machinery Co.	64

Stone

Anderson, Geo.	18
Britnell & Co.	82
Brodie, Jas.	
Christie, Henderson & Co.	82
Consolidated Stone Co.	
Contractors' Supply Co.	82
Corinthian Stone Co.	26
Crushed Stone, Limited	73
Doolittle & Wilcox	87
Hagersville Contracting Co.	11
Laurentian Granite Co.	83
McMillan & Son, R.	70
Morrison & Co., T. A.	92

Stone

	Page
Myers, Oakley	73
Roman Stone Co	13
Sackville Freestone Co.	8
Sand & Supplies	85
Thames Quarry Co.	80

Sand and Gravel

Rogers Supply Co.	31
Sand & Supplies	85

Steam Apparatus

Sturtevant Co, B. F.	73

Submarine Diver

Rouleau, Joseph N.	92

Structural Iron and Steel

Dominion Bridge Co.	84
Franklin Steel & Iron Co.	29
Steel Co. of Canada	19
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	83
Salter, W. H.	85
Steel & Radiation	23

Sewer Pipe

Britnell & Co	82
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
GartshoreThomson Pipe Co.	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	
National Iron Works	87
Ontario Sewer Pipe Co.	21
Standard Drain Pipe Co.	21

Slate

Roofers Supply Co.	87

Steel Shingles and Ceilings

Galt Art Metal Co.	

Smoke Stacks

Leonard & Son, E.	73

Safes and Vaults

Taylor, J & J	

Tents

Woods Limited	25

Testing and Inspection Bureau

	Page
Hunt & Co., Robt. W	73

Tiles

Smith Marble & Construction Co.,	

Tanks and Stand Pipes

Berg Machinery Co.	30
Inglis, John	67
Jenckes Machine Co.	2
Leonard & Sons, E.	73
Marsh & Henthorn	71
McDougall Caledonian Iron Works	69
Ontario Wind Engine & Pump Co.	89

Trade Journals

Castellanos A. W.	89

Valves

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co.	86
Kerr Engine Co.	
Marsh & Co, Jas.	82

Ventilating and Heating Apparatus

Sturtevant Co., B. F.	73

Water Softeners and Filters

Berg Machinery Co.	30
American Water Softener	

Wire Rope

Canada Wire and Cable Co.	95
Greening Wire Co., B.	
Smith, Thos. & Wm.	14
Steel Co. of Canada	19

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	72
Crescent Wire Iron Works	72
Greening Wire Co B.	
Sackett Screen & Shute Co	
Steel and Radiation	23

Water Wheels

McDougall Caledonian Iron Works.	69
Canadian Boving Co.	

Water Turbines

Escher Wyss & Co.	

Wires and Cables

Canada Wire and Cable C	95

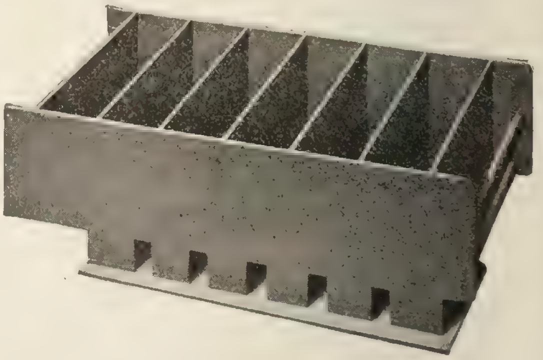
Wheelbarrows

Sackett Screen & Shute Co.	
Parker, S. E	20

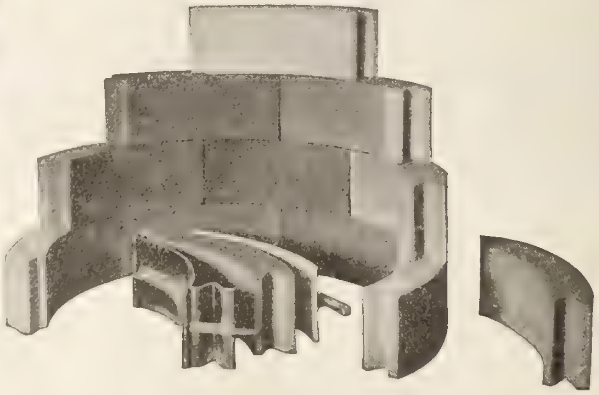
THE POPULAR AND SUPERIOR
PERFECT BRICK MACHINE
AND MY VARIOUS MOULDS ARE USED IN ALL PARTS OF THE WORLD
Patented in Canada

C. S. WERT
Inventor and Manufacturer of
The Perfect Brick Machine and Moulds
602 North Main St.,
Kendallville, Ind., U. S. A.
Write for Catalogue and Prices
Agents and Distributers wanted in Canada.

THE POPULAR AND SUPERIOR
PERFECT BRICK MOLD
IS USED IN ALL PARTS OF THE WORLD



The Perfect Well, Cistern and Silo Molds



PRICE LIST
No. 3 Circle Mold. The diameter of its circumference, 3 feet.
No. 5 Circle Mold. The diameter of its circumference, 5 feet
No. 7 Circle Mold. The diameter of its circumference, 7 feet.
All sizes up to 7 foot retail at $12.00 each. All other sizes retail at $15.00 each.
The Circle Moulds vary in length from 22 to 28 inches, depending on the diameter of its circumference.
In ordering Circle Molds always give the diameter of what you are going to build and I will then understand the kind of Circle Mold you desire
No. 10 Circle Mold is 10 ft. diam.
No. 12 " " " 12 " "
No. 14 " " " 14 " "
No. 16 " " " 16 " "
Price $15.00 each

MODERN.

→ ESTABLISHED 1861. ←

MUNDERLOH & CO. LD.

Sole Agents in CANADA for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS

AN IMPROVEMENT ON CAST IRON MAINS.

51 VICTORIA SQUARE,

MONTREAL.

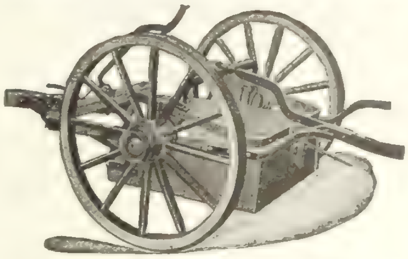
MADE UP TO 40 FEET IN LENGTH.

STRONGER.

CHEAPER.

RELIABLE.

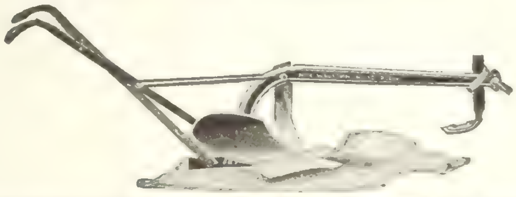
Scrapers and Grading Plows



Backed by a Reputation

Ask any contractor of large experience He will tell you that for over a quarter of a century there has been maintained a reputation for largest capacity and greatest durability for the

"Western" Line of Wheeled and Drag Scrapers and Grading Plows



The reason is a life-time's experience in actual contract work combined with an extensive manufacturing experience and every machine has been perfected after years of the most rigid tests,

Western Wheeled Scrapers, the pioneers and most extensively used characterized by square-shaped pans bent cold, general sturdy construction and many patented exclusive features. Built in any size.

Western Drag Scrapers, Chicago Tongue and Western Buck Scrapers.

Western Railroad and **Township Plows,** designed for hardest service and proved by many years of use. Any size from 2 to 16 horse power.

Get our complete catalogue of earth and stone handling machinery.

Western Wheeled Scraper Co.

Earth and Stone Handling Machinery **Aurora, Ill.**

WE GIVE YOU

Appearance and Finish

When we install our **Kalameined Clad Fireproof Doors** for you, we give you really **Fireproof Doors** that are as fine looking as any kind of a wooden door. They have a very fine appearance and you can finish them to any color scheme. If finished in Mahogany they cannot be told from the real thing. Our goods are **machine made.** There is no bulging, no nail heads or seams. Send us your details and let us quote you a figure.

A. B. Ormsby, Limited

Experts in Fireproof Windows and Doors

Factories: - - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

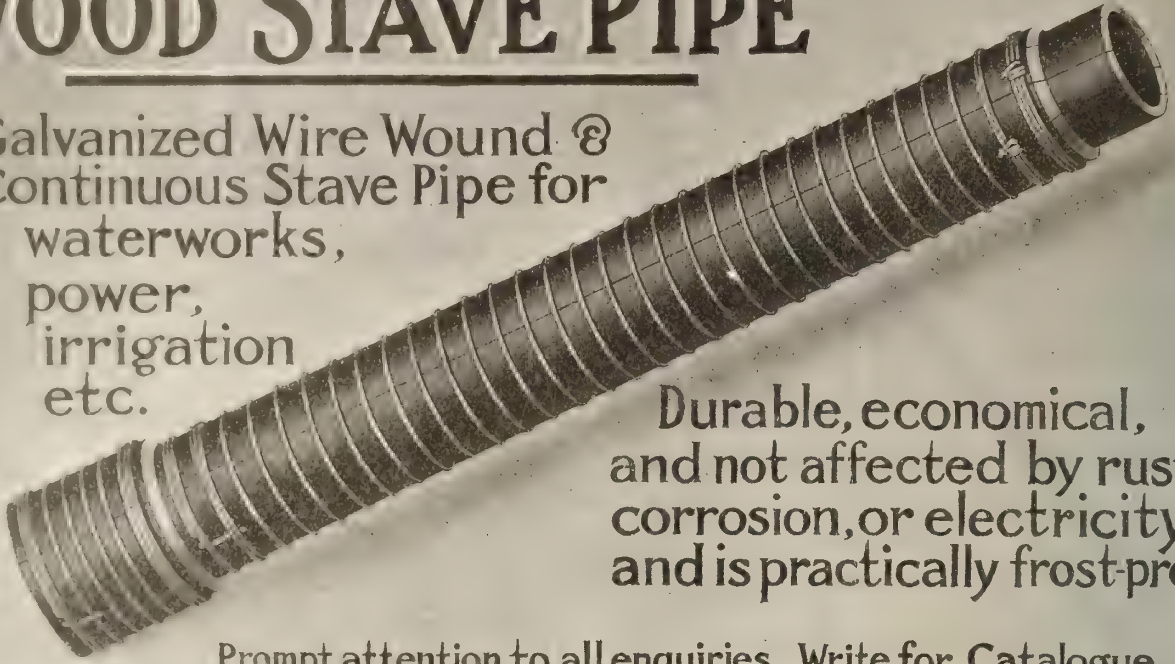
Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R.
and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

WOOD STAVE PIPE



Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

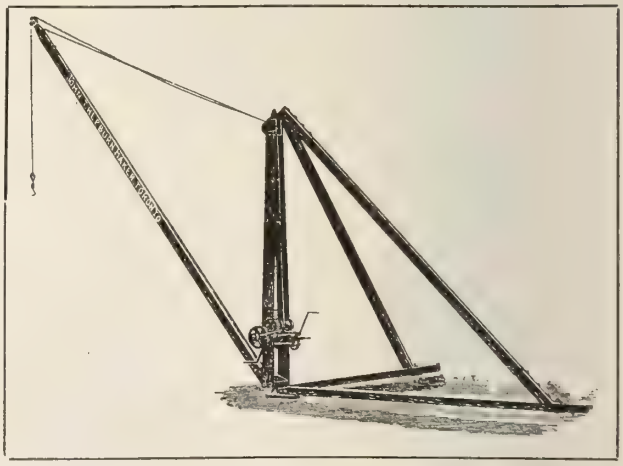
Better Order that Derrick To-Day

You have contracts on hand. Labour is scarce. And every day that passes means one day nearer the end of the season.

What are you going to do?

John T. Hepburn
Scotch Derricks

will do a lot of hard work in a little time. They are designed to do it, and built to do it—designed and built for the man who can see the spot-cash value of time saving and labour saving equipment. A HEPBURN DERRICK shows a labour saving over the old-Style derrick of fully 50 per cent. Can you afford to do without one.



Don't wait till to-morrow. Write to-day for full particulars. One day now is worth two days later on.

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company
Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

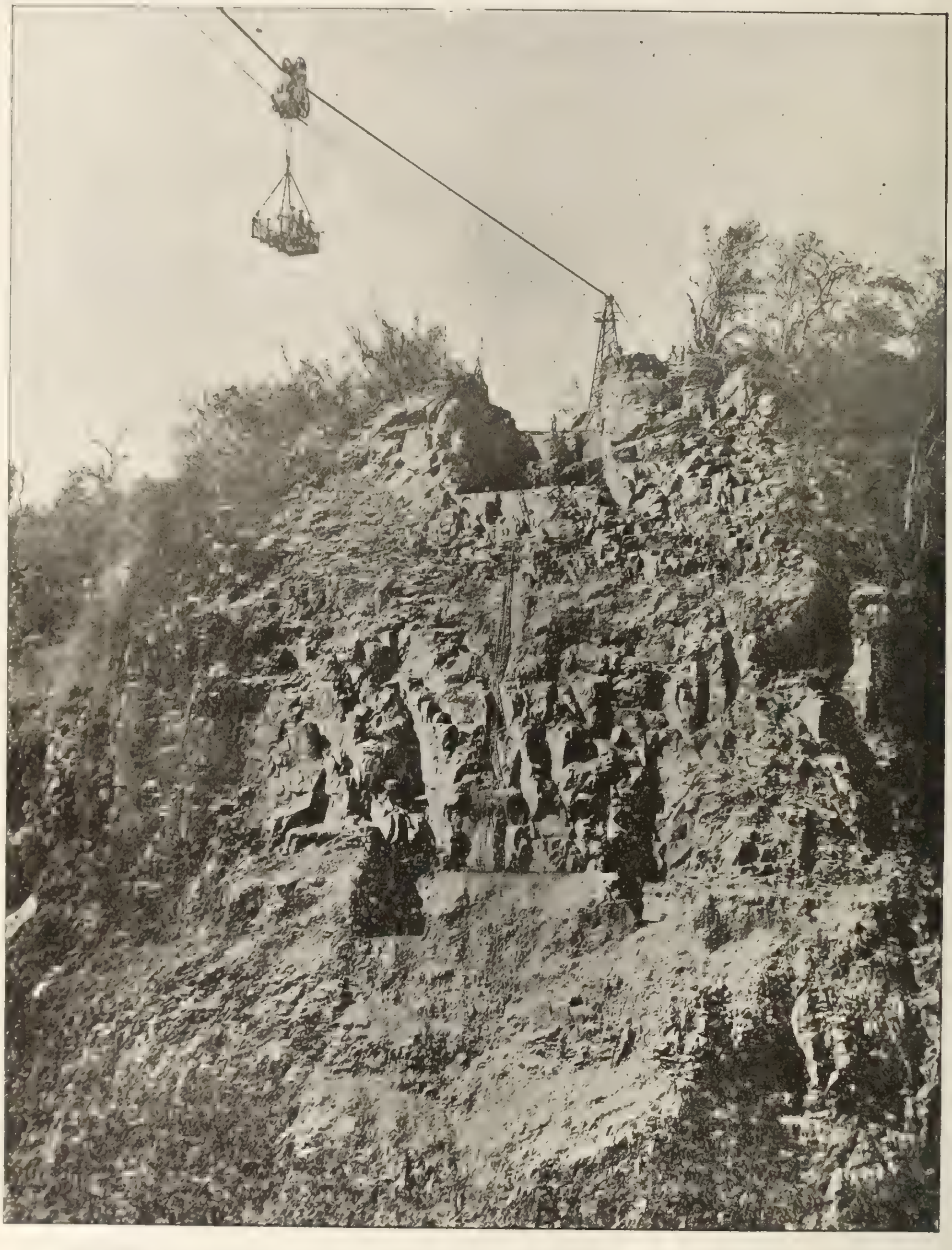
A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

THOS. & WM. SMITH, LD.,

WIRE ROPE MANUFACTURERS,

NEWCASTLE-ON-TYNE, ENGLAND.



ELECTRIC CABLEWAY OVER THE ZAMBESI RIVER AT THE VICTORIA FALLS.
Span, 870 feet. Working Load, 10 tons. Main Cable 8¼″ circ. Breaking Stress of Main Cable, 275 tons.
Main Cable supplied by THOS. & WM. SMITH LTD., Newcastle-on-Tyne.

HIGH-CLASS WIRE ROPES

For CONTRACTORS' WORK, such as BLONDINS, CRANES, INCLINES, BALLAST ROPES, &c., &c., and all classes of work requiring Wire Ropes.

AGENTS IN CANADA:

Evans, Coleman & Evans, Ltd., Vancouver. Angel Engineering & Supply Co. Ltd., St. John's, N.F.
Baines and Peckover, Toronto.

REPRESENTATIVE FOR CANADA:
D. W. CLARK, P.O. Box 521 TORONTO, ONTARIO.

USE ONLY SMITH'S "RED THREAD" WIRE ROPES.

'Champion' Road Machinery

Leads all Others

Good design will never compensate for structural weakness.

Structural strength will never make a poorly designed machine good.

It is only when Road Machinery is **right in every respect** that it can be trusted to do all that is expected of it under all conditions.

"Champion" Road Machinery leads all others because it has no weaknesses to offset its invaluable, exclusive features.

"CHAMPION" Rock Crushers

"CHAMPION" Graders

"CHAMPION" Sprinklers and Sweepers, etc.

have born the champion reputation for over 20 years. Write for the catalog before you buy—tell us which machine interests you and we will give full information.

Save 3 to 5 days on Repair Parts

Order all repair parts direct of the Hamilton Machinery Co., 144 York St., Hamilton. By sending direct you will save from 3 to 5 days in shipment of your order.

Manufactured by

American Road Machine Co., of Canada, Limited

GODERICH, ONT.

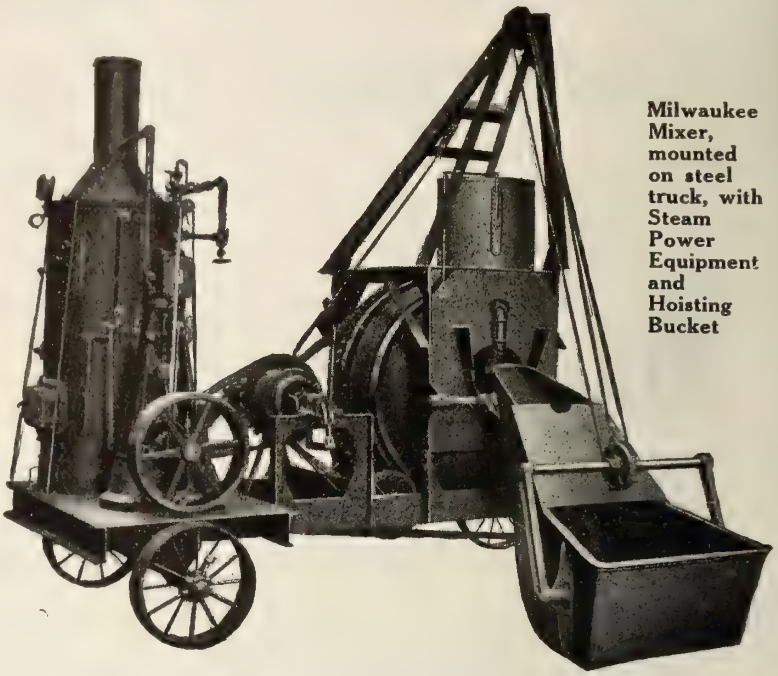
THE HAMILTON MACHINERY CO., LIMITED, HAMILTON, ONT.

Sole Agents for the Above Company

Also Canadian Distributors for the famous Inter-State Automobile.

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

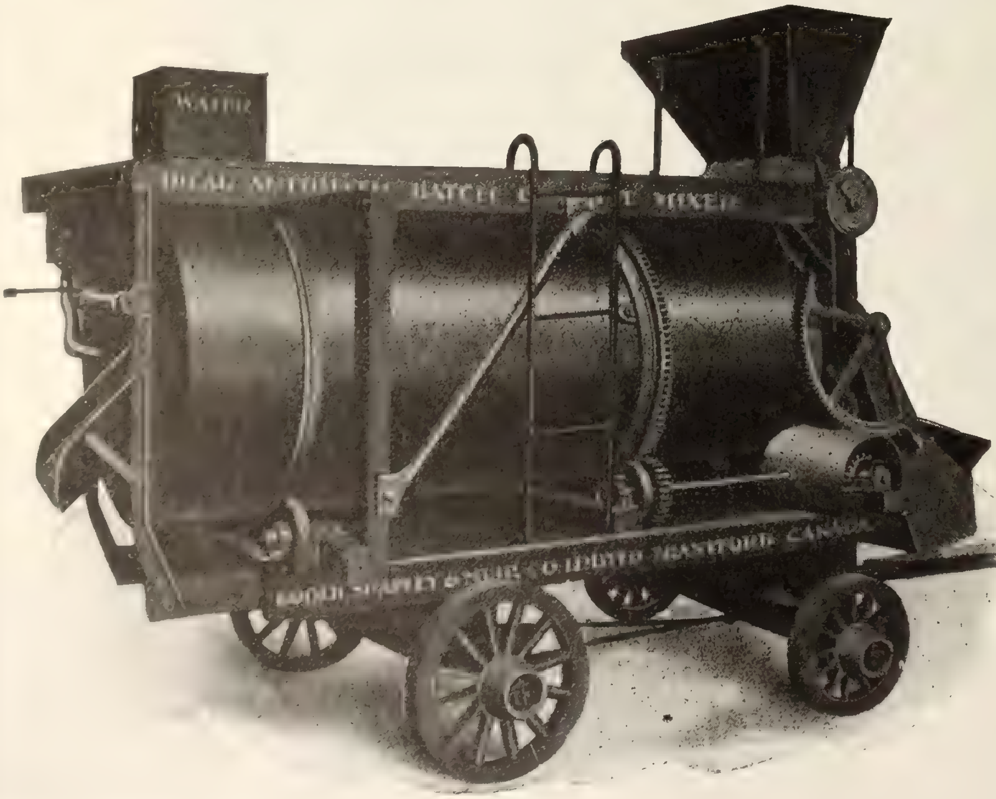
MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES.

The Stuart Machinery Co., Winnipeg, Man. C. W. Stancliffe & Co., Vancouver, B. C.
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS



Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

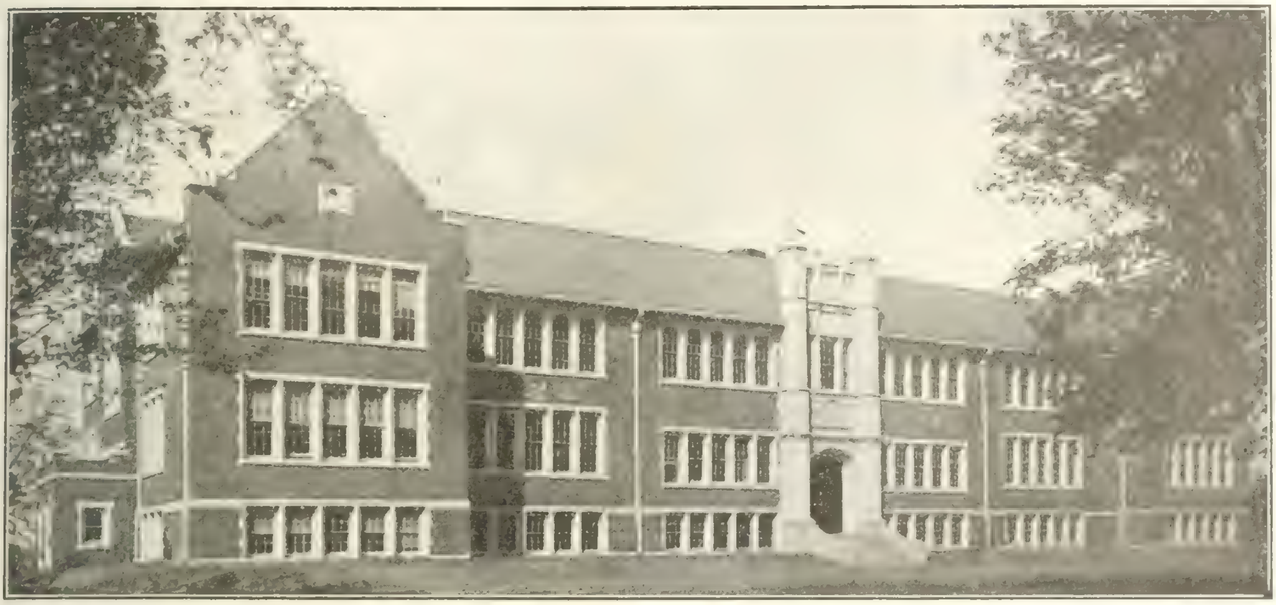
Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY
& MUIR CO. LTD.
Brantford, Canada

Hamilton Pressed Brick



New Collegiate Institute, Brantford, Ont. Chapman & McGiffen, Architects, Toronto

For Clean Brick-Work

This brick is free from so-called soda. After twenty years it will look as clean and fresh as the day it is delivered. Hamilton Pressed Bricks are uniform in size and color. The illustration shows a neat, clean cut job obtained with our brick. Specify **more** than "Brick" make it **"Hamilton Pressed Brick."**

Besides furnishing a high class product we can fill your orders promptly. Connections with T. H. & B., C. P. R., G. T. R., M. C. R

Hamilton Pressed Brick Company

Limited

Phones
Factory 1992
Office 2931
Residence 345

Spectator Building, Hamilton, Ont.

Toronto Representative, WALTER HUNTER, 105 MACDONELL AVE. Telephone Park 3170
Montreal, STINSON-REEB CO., Eastern Townships Bank Building.

Circular Diamond Saws

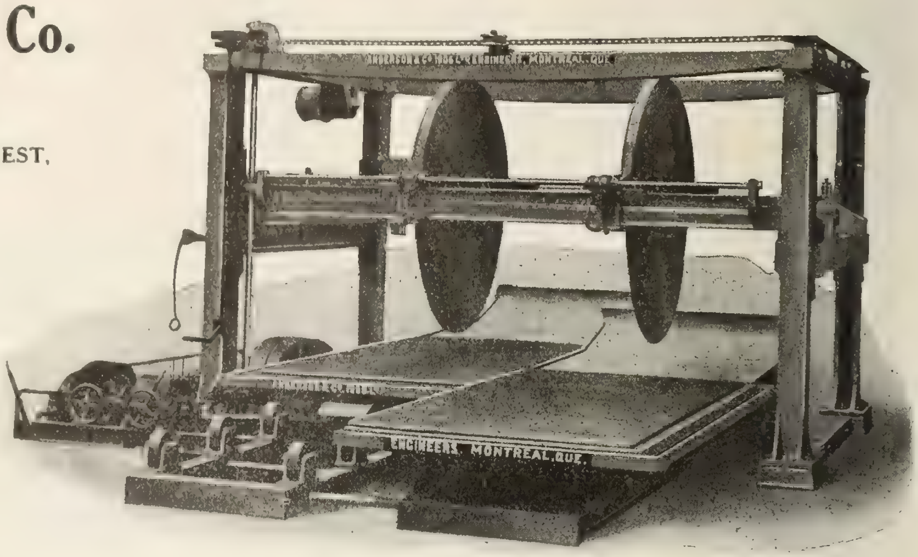
For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICES & WORKS
London, England, 82 Victoria St., S.W.
Newark, N.J., U.S.A. 420-422 Ogden St.
Montreal Works, 157 Craig St. West
Head Works, Carnoustie, Scotland

MAKERS OF

Gangs, Planers, Marble Dressers, Derricks, and Electric Traveling Cranes up to 50 tons, Quarry Machinery, Gas Engines and Producer Plants.
10 H. P. to 150 H. P.


ANDERSON & CO. 1905 LTD. ENGINEERS, MONTREAL, QUE.
ENGINEERS, MONTREAL, QUE.

Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 **SINGLE AND DOUBLE TABLES**

About 50 of the above Machines at work in Canada

A Reliable Waterproofing

For Cement and Concrete

Unlike all others for foundations, cellars, cellar floors, tunnels, dams, reservoirs, swimming pools, building walls, bridges, etc.

What is Ceresit ?

Ceresit is the name of a dependable waterproofing.

Ceresit is a cream white paste which is added to, and is generally dissolved in the water used in mixing cement mortar and concrete.

By mixing in the water the Ceresit permeates the entire mass uniformly. This is impossible with powdered waterproofing.

Ceresit for Concrete

Ceresit is incorporated in the concrete mass and thus becomes a part of it, permanently rendering the mass proof against the penetration of water even under great water pressure besides protecting it from frost.

Please write for our Book "S" on "Waterproofing" for Cement and Concrete. Ceresit is catalogued on pages 46 and 47 of Sweet's Index.

Ceresit Waterproofing Company, Chicago
General Offices Commercial Bank Bldg.
Branches: 1133 Broadway, New York 1218 Chestnut St., Philadelphia

Italian Pool in the Gardens of Doubleday, Page & Co., Publishers of "Country Life," at Garden City, Long Island, waterproofed with Ceresit

Ceresit for Cement Mortar

Ceresit can be mixed with the water used in cement mortar coating to waterproof or dampproof structures built of any material such as brick, stone, concrete stucco, plaster and tile.

Ceresit is Guaranteed

Ceresit is guaranteed to be an unfailing, permanent waterproofing when the work is done under our direction.

PLEASE CUT OUT THIS

REMINDER
to write for BOOK "S" on
WATERPROOFING
to Ceresit Waterproofing Co., Commercial Bank Bldg., Chicago.

USE

"TOCKOLITH"

(TOCH BROTHERS)

IT PERMANENTLY PROTECTS IRON AND STEEL AGAINST ALL RUST AND CORROSION

IT COMBINES WITH INITIAL RUST AND PREVENTS FURTHER ACTION

SEND FOR CIRCULARS AND INFORMATION

INVALUABLE FOR

STRUCTURAL IRON
STEEL GIRDERS
STEEL SMOKE STACKS
STEEL BRIDGES

CANADIAN OFFICE AND FACTORY

THE R. I. W. DAMP RESISTING PAINT CO.

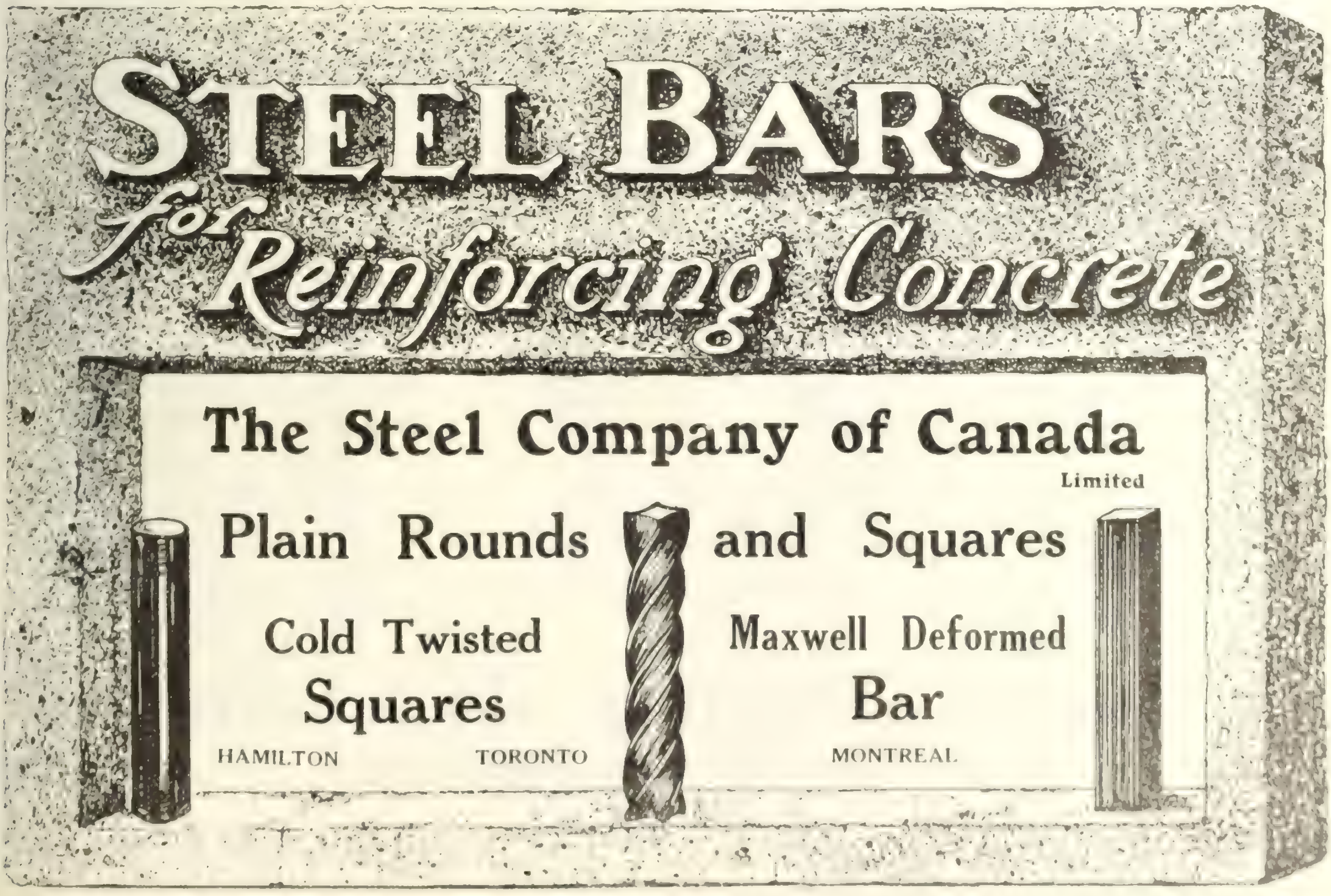
1372-1376 BATHURST STREET - TORONTO

CANADIAN DISTRIBUTERS:

CHILLAS-BLACK, LIMITED
TORONTO

E. F. DARTNELL
MONTREAL

WM. N. O'NEIL & CO.
VANCOUVER



The Steel Company of Canada
Limited

Plain Rounds and Squares

Cold Twisted Squares

Maxwell Deformed Bar

HAMILTON TORONTO MONTREAL

J. H. NEW, President RYLAND H. NEW, Vice-Pres.

Hamilton Vitrified Salt Glazed Sewer Pipe

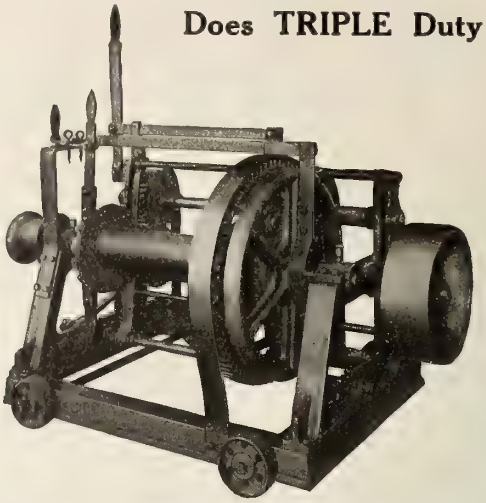
Known as the best for 50 years
The Quick Shippers

The HAMILTON & TORONTO SEWER PIPE CO., LIMITED
HAMILTON and TORONTO

LONG DISTANCE PHONES: Toronto, Main 990, College, 1558
Hamilton, 3990, 3991, 3432

The Parker Reversible Friction Hoist

Does TRIPLE Duty



Run with Gasoline Engine or Motor

No Experienced Operator Required

Drum, Elevator Sheave, Winch-head all operate independently of each other, and are each reversible. This hoist operates a derrick from the drum, a double cage material elevator from the sheave, and serves various other purposes from the winch-head—all on one job.

PAYS FOR ITSELF ON ONE ORDINARY JOB.

"I have used your No. 100 Reversible Hoist for over 5 years. It runs like a clock and has cost me nothing for repairs."

From an Experienced Contractor.

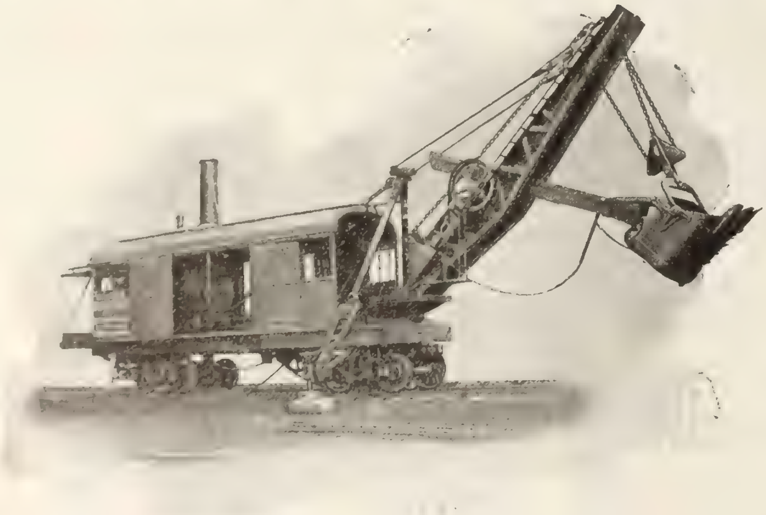
We also build derricks, steam and electric hoists in all sizes. Sole manufacturers of the PARKER PATENTED DERRICKS.

Write for information and prices.

S. E. PARKER, 1800-2 N. Francisco Ave., Chicago, Ill.

Selling Agents:
Gorman, Clancey & Grindley, Calgary and Edmonton, Alta.
J. L. Stuart Machinery Co., Winnipeg, Man.
A. G. Langley & Co., Vancouver, B.C.
F. H. Hopkins & Co., Montreal, Que.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

The

Standard Drain Pipe Co.

Limited

Two Factories:

St. Johns, P. Q. and New Glasgow, N. S.

Manufacturers of

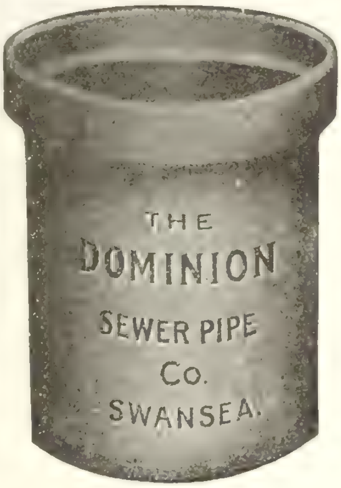
Sewer Pipes, Culvert Pipes, Chimney Linings, Hollow Building Blocks, Fire Clay, Stove and Range Bricks and all kinds of Fire Clay and Vitrified Goods.

Catalogue and prices on application

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

Telephone (Toronto Connection)
Park 1809

The Dominion Sewer Pipe Co.

(The Independent Co.) Limited

SWANSEA (near Toronto)

Mimico Pipe - Is Right

Round Pipe and Square Dealings

It is Vitrified and Salt-Glazed

AND WILL MAKE YOUR

Sewer or Culvert

A Credit to You

AS SMALL AS 4 AND AS BIG AS 24
SINGLE AND DOUBLE STRENGTH

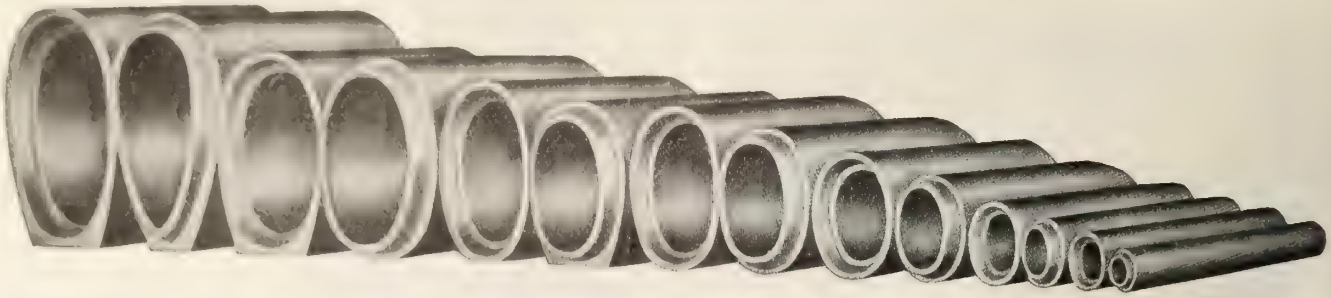
Orders Promptly Filled

Try Us

The ONTARIO SEWER PIPE COMPANY, Limited

MIMICO, ONTARIO

Telephones, Toronto Connection, Park 422; Evenings, Park 3888 and 3889



We Guarantee Our

Reinforced Concrete Pipe

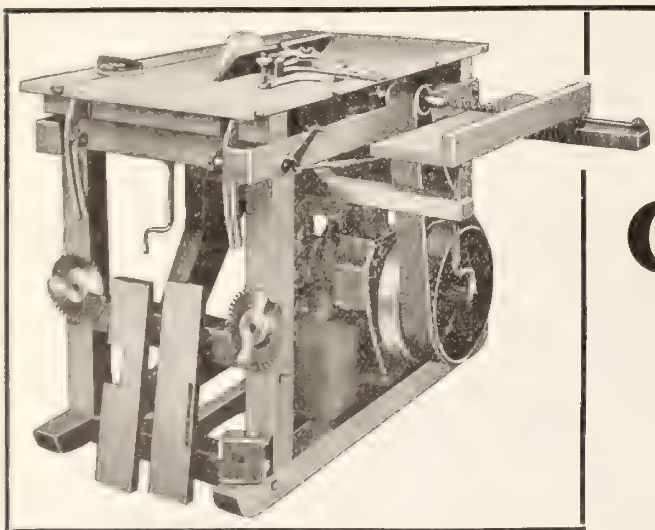
for Culverts and Sewers

"Long Service at Low Cost"

Our **Pipe** is **frost-proof, indestructible** and **everlasting.** It is easily handled, easily placed, and easily procured. It has been approved by **most particular, most renowned, most experienced,** and **most skilled engineers.**

Stock sizes 6 inch to 48 inch. Other sizes to order. Write for catalogue and prices.

Dominion Concrete Company, Limited
KEMPTVILLE - ONTARIO



On Every Concrete Job

You can save 10 to 15 per cent by using our Contractor's Portable Saw and Variety Woodworker.

Now is the time when you are starting to do your concrete work and this saw will be just what you are looking for—a cheap practical saw that will prove itself a time saver and money maker for you.

CONTRACTORS SUPPLIES OF ALL KINDS

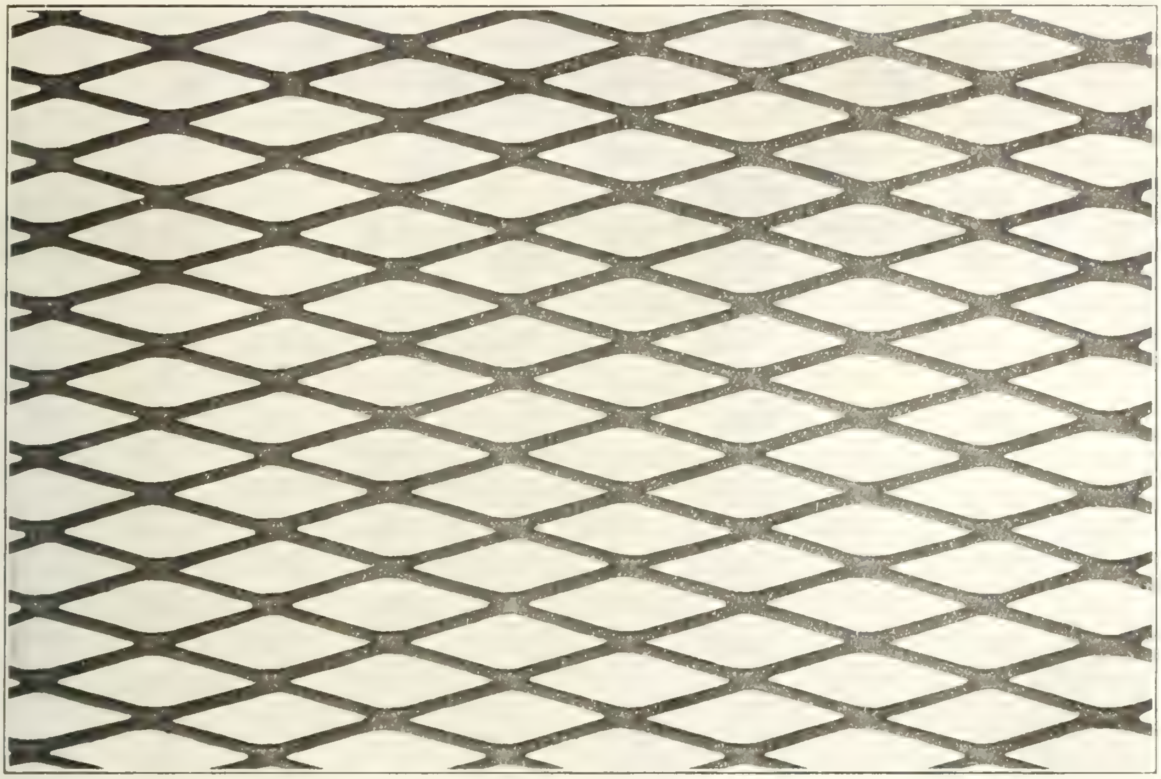
The Canadian Fairbanks Co., Limited

Fairbanks-Morse Gas Engines, Fairbanks Scales. Safes and Vaults.

Montreal Winnipeg Toronto Vancouver
St. John, N.B. Calgary Saskatoon Ottawa

WHAT IT IS

- A Rip Saw
- A Matcher
- A Mitre Saw
- A Cut-Off Saw
- A Dado Machine
- A Jointer
- A Boring Machine
- A Gaining Machine
- A Grooving Machine
- A Babbitting Machine
- A Moulder with Self-Contained Power



"Steelcrete" Diamond Mesh the Lath with a Reputation

Since Expanded Metal was first made in Canada "Steelcrete" has been the acknowledged standard from Coast to Coast.

To-day, there are more yards of it in actual use, probably, than all other Canadian Laths combined—a few "Steelcrete" jobs being the King Edward Hotel, Toronto, the Royal Mint, Ottawa, Ontario Parliament Buildings, Toronto, Winnipeg Post Office, new East and West Blocks Dominion Parliament Buildings, Ottawa.

"Steelcrete" Expanded Metal Lath

-weighs 3½ lbs. per square yard—half as much again as is claimed for laths of same gauge.

-acquiring rigidity by shape and weight of strand has no raised ribs or beads to bury—hence makes plastering easier, quicker and cheaper.

-being made in sheets 30″ wide wastes only half as much in laps and costs only half as much to apply as other laths.

—is made by same process and with same care and precision as heavy expanded metal therefore is perfectly flat and straight.

Samples, Prices and Lath Catalogue on Request.

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE FRASER AVENUE

MONTREAL
138 CRAIG STREET WEST

St. John 13 Germain St.
Quebec 153 St. Paul St.
Ottawa 83 Banks St.
Regina Black Block

Fort William 113 N. May St.
Winnipeg 331 Garry St.
Calgary—309-8th Avenue.
Vancouver 416 Pacific Bldg.

The Permanent Roof

"Asbestos Shingles"

8″ x 16″ Asbestos Shingles laid according to American Method

For a waterproof, weatherproof, fire resisting roofing material there is nothing to equal Asbestos Cement Slate.

The stringy Asbestos fibres are imbeded cross-wise in the cement paste producing the same effect as concrete steel constructions.

ALWAYS SPECIFY

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P. Q.
Factory at Lachine, P. Q.

TENTS

for Engineers and Contractors

We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

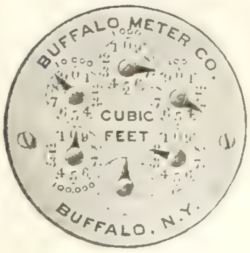
**Send for our catalogue
It will interest you**

Woods Limited

Woods Building - Ottawa, Ont.

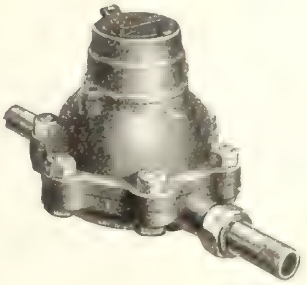
AMERICAN AND NEW NIAGARA

WATER METERS



Standard Dial

Straight Reading Dial



Jewel Bearing
Intermediate Gears
Self Cleaning and Sanitary
Adjustment for Pressure
Extra Thick, Strong Disc
Accuracy Guaranteed
Fewest Parts

BUFFALO METER CO.

290 TERRACE, BUFFALO, N.Y.

**The United States Steel Corporation, at Gary, Ind.;
Stone & Webster Engineering Corporation, Minneapolis, Minn.;
A. Monsted Co., Milwaukee, Wis.;
Geo. B. Swift Co., 903 Security Bldg., Chicago.;
Pacific Coast Condensed Milk Co.. Seattle, Wash.;
Sheffield Farms-Slawson Decker Co. Amenia, N.Y.; and
Inland Steel Co., Indiana, Ind.,
are among the largest users of concrete in the United States. They and many others, are using**

REICHERT METAL FORMS

And saving from 3 to 7 cents per square foot.

Why do YOU stick to the old methods and let this additional profit slip away from you?

Building a big factory building with Reichert Metal Forms. Pacific Coast Condensed Milk Company's plant at Berlin, Wis. Stone & Webster Engineering Corporation, builders.

REICHERT MFG. CO.

MILWAUKEE, WISC., U.S.A.

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

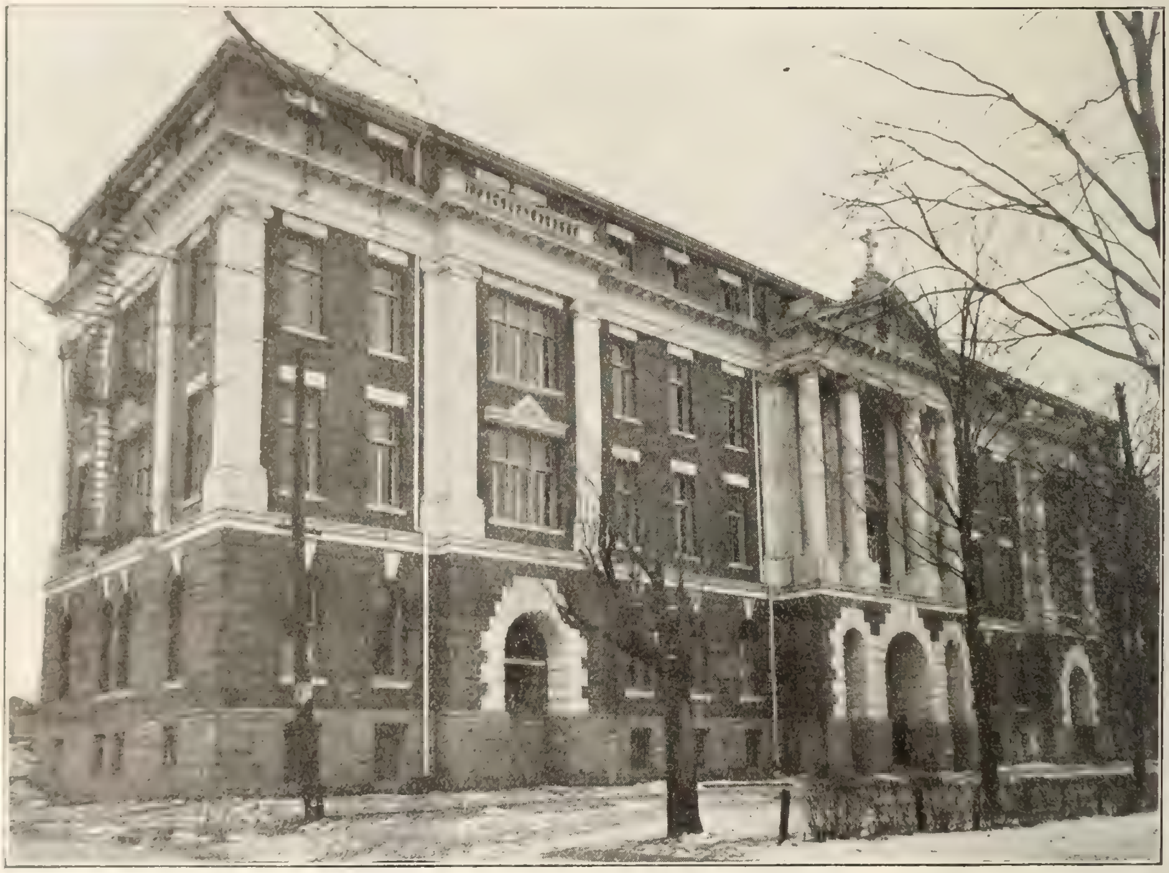
Write for Catalogue

Main Office - 90 West Street

New York City

Corinthian Stone

is extensively used for Churches, Schools and Colleges. In trimmings for brick or stone work, it is without an equal. Special prices for any work where a large quantity of repetition occurs.

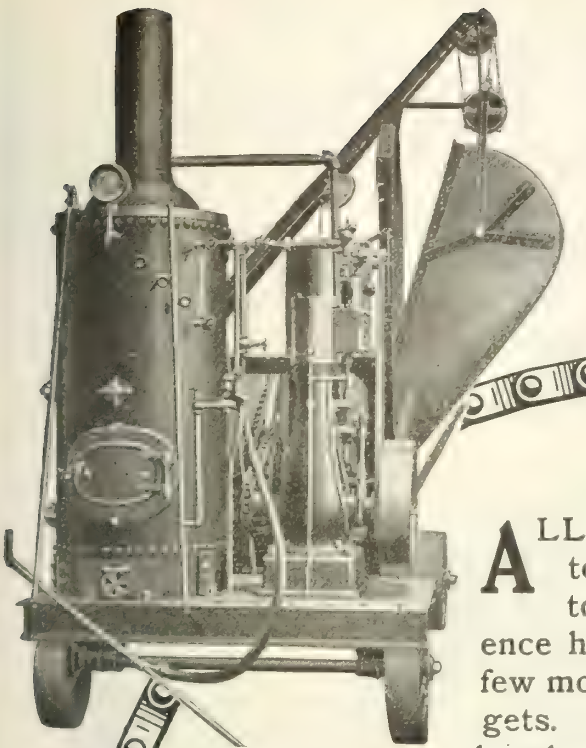


St. Jerome College, Berlin, Ontario.

A large quantity of Corinthian Stone was used in building this well-known College. Estimates given for all classes of work. Send plans or write to :: :: :: : ::

The Corinthian Stone Co.

OFFICE AND WORKS:
G. T. R. JUNCTION, GUELPH, ONTARIO



ASK THE USER

He can tell you what satisfaction the Chain Belt Mixer has given him. If we did not know that he is more than satisfied we would not dare risk future sales on past operations. The mixer that can be sold on this basis is the Mixer for you to buy.

ALL mixers may look alike to you as automobiles do to most people. The difference however will show up after a few months of the hard usuage a mixer gets. If you want a mixer that you can be absolutely sure of in regard to construction as well as to operation buy a

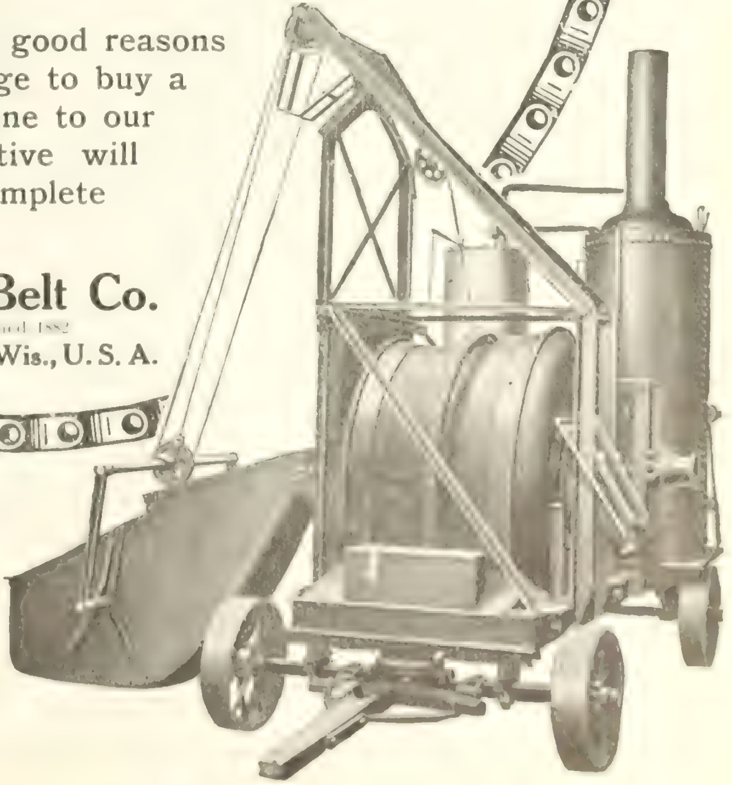
Chain Belt Mixer

You'll get a mixer that has that same high quality about it that has made our product famous for a third of a century.

You'll get a mixer that will turn out perfect concrete a little quicker than any other mixer and be a little better in every detail of construction.

There are any number of good reasons why it is to your advantage to buy a Chain Belt Mixer and a line to our nearest representative will bring catalog and complete information.

Chain Belt Co.
Established 1882
Milwaukee, Wis., U. S. A.



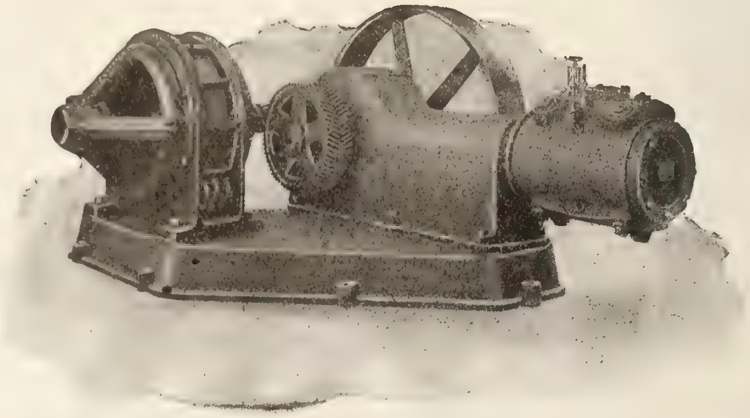
CANADIAN REPRESENTATIVES

Mixers in Stock for Immediate Delivery

MONTREAL—Canada Machinery Agency.
WINNIPEG—Dominion Supply and Equipment Co.
VANCOUVER—Robt. Hamilton & Co.

Portable, Gear Driven

COMPRESSORS



Rand Class "NE—1" Straight Line Compressor mounted on a rigid sub-base and geared direct to an Electric Motor. A high speed, simple and perfectly automatic machine particularly adapted to contracting duties, where electric power is available.

The gear driven Class **"NE-1"** Compressor is a simple, reliable design in which automatic operation is combined with great power economy. This type permits of the advantage of direct electric drive at a very moderate first cost.

It is a well known fact that power economy is best effected by generation from a central plant.

Why not take advantage of this direct electric drive and economize on your power consumption, instead of generating your own power by small expensive boiler units.

Class "NE-1" Compressors are built in standard capacities of 50 to 300 feet free air per minute. Pamphlet K-92.

PNEUMATIC TOOLS **ROCK DRILLS**

CANADIAN RAND CO., LIMITED

Commercial Union Building, MONTREAL, CAN.

Toronto, Cobalt, Winnipeg, Lethbridge, Rossland, Vancouver, Halifax
South Porcupine Spokane Sydney

Steel Bars for Concrete Reinforcement

A reliable source of supply which will insure prompt deliveries on all your orders, large or small, is what we offer you.

We carry a large stock of rounds, squares and twisted bars throughout the building season, from which we can guarantee you immediate shipments.

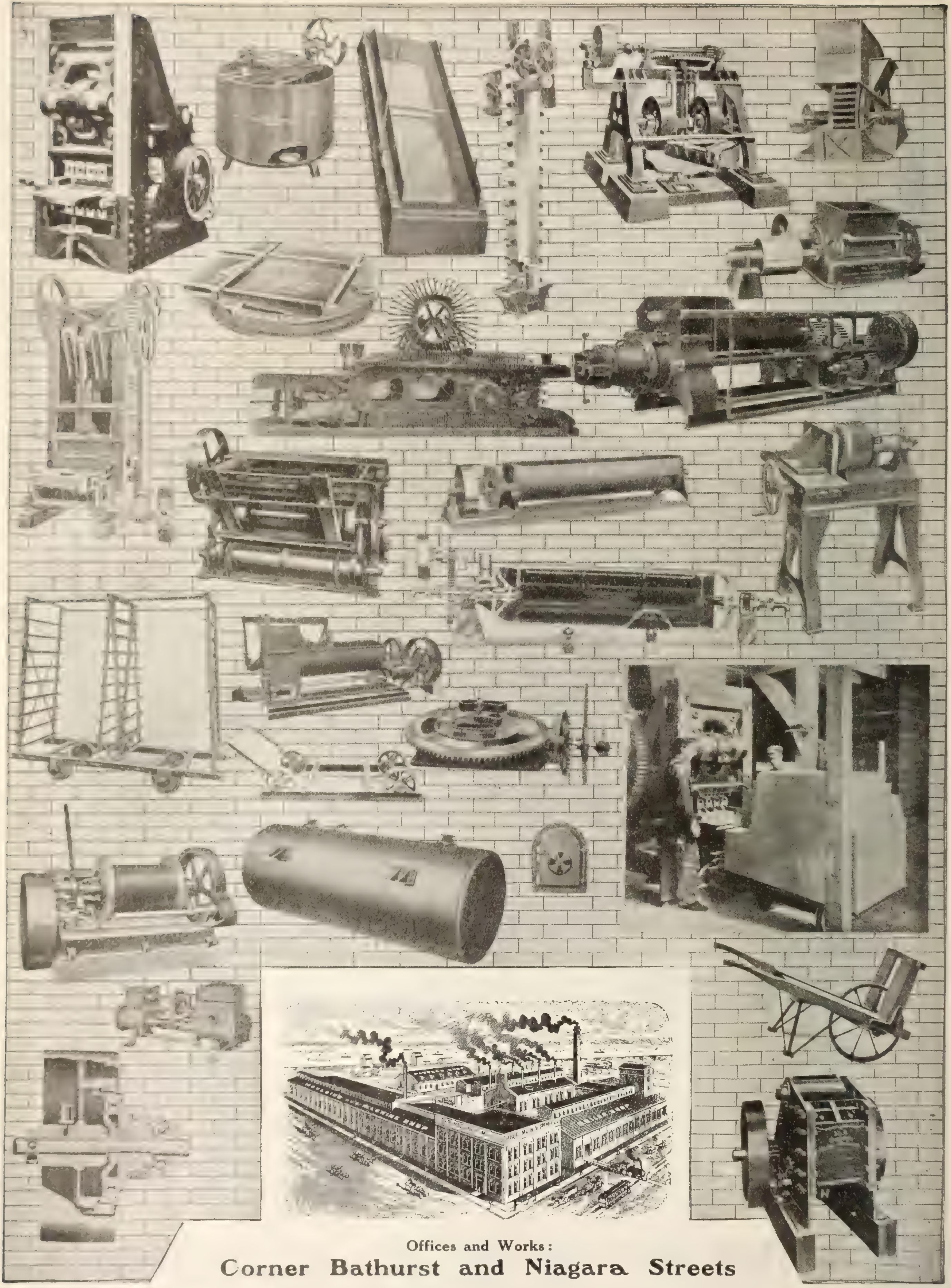
SIZES
¼″ to 1¼″
in all styles

No charge for cutting to exact lengths, no extra for twisted bars.

If you are interested in getting your steel promptly, if you want attractive prices, superior quality, and courteous, careful attention, we believe that you will be interested in our service.

FRANKLIN STEEL COMPANY

Franklin - Pennsylvania



Offices and Works:

Corner Bathurst and Niagara Streets

The Berg Machinery Manufacturing Co., Limited

Toronto - Ontario

Tel. Main 4155

We are now in the

Sand Business

Our Wagons hold 2½ Yards

High Grade Sand and Prompt Delivery

Rogers Supply Co.

28 King St. West,

Toronto

KITON is nothing else but **TAR**

which through a Patented Process is made

Soluble in Water

This solubility however is lost, the moment KITON becomes dry for the first time, that is, after evaporation of the water with which it is mixed. From that instant on, KITON can never be re-dissolved in or washed off by water. It is **impervious** and **weatherproof.**

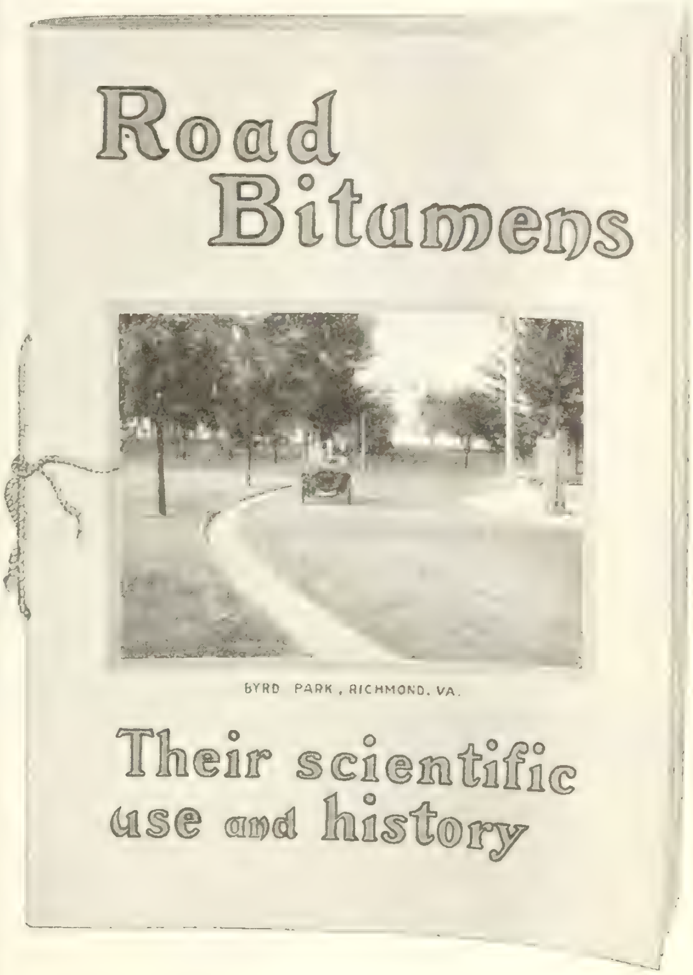
just like tar

BECAUSE it can be applied as easily as ordinary paint,
" it can be coloured if desired,
" it is so economical and yielding,
" it is instantly ready when you want it,

KITON is the cheapest and most reliable surface coating for material subjected to the deteriorating action of weather and atmosphere.

ASK FOR BOOKLET, SAMPLE AND PRICES
ATTRACTIVE PROPOSITION FOR DEALERS

F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.



Road Bitumens

BYRD PARK, RICHMOND, VA.

Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a pamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement Company
First National Bank Building
CINCINNATI

CONTRACTORS LOCOMOTIVES

ONLY ONE QUALITY

Montreal Locomotive Works, Limited, standard contractors locomotives are designed by engineers who have made a life study of the special conditions of contractors service and know what is needed to meet these conditions.

Their large boilers insure free steaming and ability to handle the load for which they are rated. Every piece of material entering into their construction must conform to the same specifications required for 200-ton locomotives. Only the best materials are used.

Contractors locomotives must frequently be operated long distances from repair shops, therefore simplicity and facility for repairs are vitally necessary. This was considered in designing this type of locomotive.

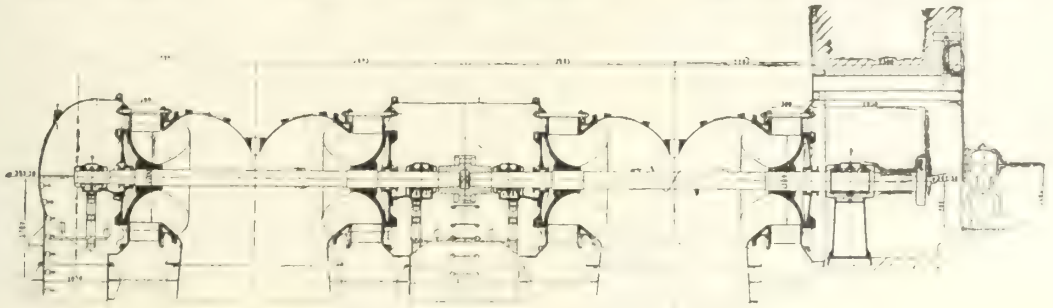
Every part is made in jigs or to gauges, and every part is sure to fit. Stocks are always available at our Works at Longue Pointe, Montreal, Canada.

MONTREAL LOCOMOTIVE WORKS, LIMITED

OTTAWA BANK BUILDINGS, MONTREAL, CANADA

WATER - POWER PLANTS
LOW PRESSURE TURBINES

Any Output. 5,000 Turbines Supplied. 2,000,000 Horse Power.



26 ft. Head. 5,000 H. P.
Four Units as illustration on order for the German-Swiss Water Power Company

ESCHER WYSS & CO. - ZURICH, SWITZERLAND

CANADIAN HEAD OFFICE, 408 LUMSDEN BUILDING, TORONTO
PHONE, ADELAIDE 234

You should urge the use of Preston Steel Ceilings . . . .

Because. . . . . these ceilings are actually far cheaper than plaster, in the long run, as they never need repairs and will outlast the building it self. Thus they are the most permanent ceiling money can buy.

Because. . . . . Preston Steel Ceilings are fireproof; dampproof; sanitary—can be washed as readily as a window-pane. They lower the insurance rate and increase the health rate. They are the modern ceilings—plaster is a mere makeshift.

Because. . . . . Preston Steel Ceilings can be decorated charmingly by any painter, as soon as they are in place. And they have a score more merits of utility and economy that we would like to point out to you, and through you to your customers. Ask for pattern book and price lists. Address

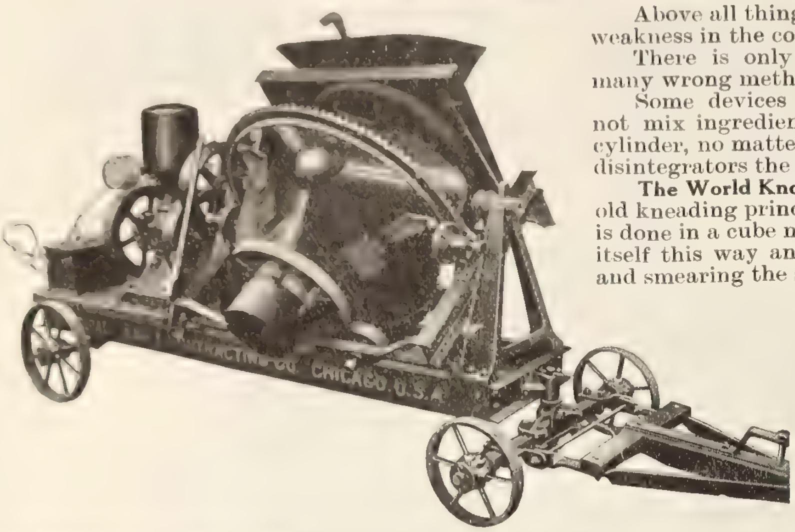
Over 1,100 DESIGNS

Ask for the book

The Metal Shingle & Siding Co.
Limited
Preston, Ontario
Branch Office and Factory - MONTREAL

Why Every Engineer Should Specify and Every Contractor Use

CUBE MIXERS



Above all things concrete work must be built to endure. Any weakness in the concrete mass is fatal to the job.

There is only one sure, true method of concrete mixing, but many wrong methods.

Some devices sold as mixers are only separators, You cannot mix ingredients by whirling them around inside a drum or cylinder, no matter how many paddles or shelves and other inside disintegrators the machine may have.

The World Knows No Better Method of Mixing Concrete than the old kneading principle of folding a batch of concrete over itself as is done in a cube mixer, squeezing it together, pounding it against itself this way and that, grinding its particles against each other and smearing the sticky paste composed of the finer particles—all the while changing its shape with 18 different motions to the right and to the left, then forward over and over itself, with ten times as much effectiveness at every rotation of the cube as is possible with three revolutions of the drum-type mixer, which merely whirls it around and separates it as it rotates.

It requires very little investigation to determine which is the true principle of mixing if you will but see the *Chicago Improved Cube Mixer* in operation and compare it with any other method.

MADE IN FOURTEEN SIZES TO SUIT ANY MIXER NEED.

WRITE FOR FREE BOOK NO. 8-H ON SCIENTIFIC CONCRETE MIXING.

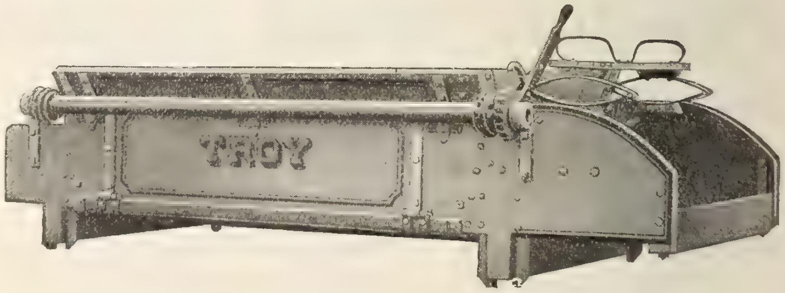
Municipal Engineering & Contracting Company

Railway Exchange, Chicago, Ill. **New York Office, 30 Church Street**

Canadian Equipment & Supply Co., Calgary and Vancouver—Agents for Western Canada.

Five Hundred Troy Dump Boxes Wont Last Long at These Figures

We want to demonstrate quickly to the largest possible scope of territory the great saving that can be made by the use of TROY Bottom Dump Boxes in connection with regular teaming gears on all dirt moving jobs.



We want to reach the team-owners and contractors who don't know TROY Dump Boxes. Many of them have never seen a TROY and won't believe the saving until they do see.

One TROY Box in a community means an order-getting booster for us. Every sale means more sales and lots of them. That is why we have set aside 500 TROY Boxes for special advertising purposes.

But we must Limit Purchases under this Special Proposition to One Box per Customer

Our regular price for the 1½ yd. Box is $45.00 each and for the 2 yd. Box, $50.00.

We will furnish 500 Boxes at the following special advertising price—good only as long as the 500 Boxes last and no order accepted at these figures after September 1st, 1911.

Special Advertising Price, 1 1-2 Cu. Yd. Box............ $36.90 each.
" " " 2 Cu. Yd. Box................ $40.20 each.

Terms net cash with order, F. O. B. Troy, Ohio. Boxes furnished to fit any size gear.

First come, first served. They are going fast. If you want a TROY Box at these figures, MAIL YOUR ORDER TO-DAY.

THE TROY WAGON WORKS COMPANY

North Market St. TROY, OHIO

London Automatic Batch Mixer No. 1
Capacity 50 yards per 10 hours.

London Concrete Mixers

are made in all sizes, meeting every requirement. CONTRACTOR, WE DO NOT DICTATE TO YOU AS TO WHAT STYLE OF MACHINE YOU SHOULD PURCHASE, we have EVERY STYLE AND SIZE of mixer required.

London Automatic Batch Mixer No. 2. Capacity 25 yards per 10 hour

These machines will be shipped anywhere on approval. WHY PAY A LARGE PRICE FOR CONCRETE MIXER WHEN YOU CAN PURCHASE AN AUTOMATIC MACHINE AT A MODERATE PRICE?

The London Automatic Machines will save you money—
- Cost of Producing Concrete.
- In the First Cost of Mixer.
- Cost of Maintenance.

We also Manufacture—

CARTS FOR CONVEYING CONCRETE BLOCKS AND TILE
WHEELBARROWS; CONCRETE CARTS
FACE-DOWN BLOCK MACHINES; FRICTION HOISTS
CEMENT BRICK MACHINES; POWER HOISTS
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES

ADJUSTABLE SILL, STEP AND WINDOW CAP MOULDS;
SEWER PIPE MOULDS; FENCE POST MOULDS;
ORNAMENTAL MOULDS; SILO CURBS
CONCRETE CHIMNEY CURBS;
ROCK CRUSHERS;
And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.

London Concrete Machinery Co., Ltd., 19 Marmora St., London, Canada

Branches

A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
Hamilton Machinery Co., 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.
Foss & Hill Machinery Co., 329 St. James St., Montreal.

(See Our Exhibit at Toronto Exhibition, South-east of Machinery Hall, or London Exhibition in Cement Machinery Hall.

DOORS

Pine and Hardwood Veneer

Interior Finish

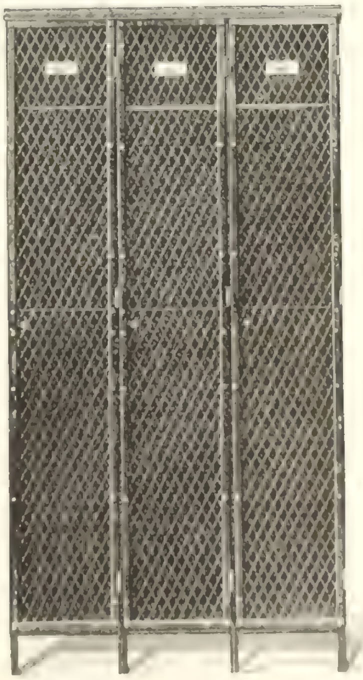
Sair Work

Interior Hardwoods

Send us your plans and specifications and let us quote you

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario

GET AWAY



from the old style wooden lockers and use **Meadows' Metal Lockers.** Their construction is rigid and embodies a number of original features not found in other makes worthy of your consideration.

Send for our interesting booklet entitled
"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA

EADIE-DOUGLAS LIMITED

HEAD OFFICE: 12-14 University Street, MONTREAL

Building and Mechanical Supplies and Specialties

BRANCH OFFICES:
TORONTO, - - 65 Victoria Street
WINNIPEG, - - 445 Main Street
OTTAWA, - - 198 Queen Street

REPRESENTING

Leeds Fireclay Company

Burmantofts Architectural Terra Cotta and Enameled Brick. Used by leading Architects and in representative buildings throughout Canada.

"Keystone" Fireproofing Company

Keystone Gypsum Partition Blocks and Furring. Fireproof, Soundproof, better and cheaper than Terra Cotta.

"Esco" Steel Coating and Preservo

A Waterproofing preservative paint for steel, wood and concrete. The solution of all paint difficulties. **PRESERVO—A preservative and waterproofing** for canvas.

"Terrano" Flooring Co'y of Canada, Limited

Terrano Jointless, sanitary flooring. Laid throughout the world, in hospitals, schools, hotels, private houses, power plants, factories, warehouses, etc.

Alphons Custodis Chimney Construction Co.

Custodis Radial Brick and Concrete Chimneys. Are in service in the largest plants in Canada and are lasting monuments to good judgement and business enterprise.

Edward Darby and Sons Company

"Pen Dar" Metal Lockers are the standard throughout Canada. The strongest and best constructed metal lockers, in all different styles and prices.

Mellows & Company Limited

Eclipse Lead Covered Clazing Bars for skylight Construction. Last a lifetime without any painting or repairing. MELLOWS STEEL SASHES AND CASEMENTS.

"Insulyte" Company Limited

A complete organization for the selling and installing all classes of insulating material.

B. F. Sturtevant Company (Eastern Canada Only) { **Sturtevant Electric Vacuum Cleaners,** simple, effiicient and lasting. Ventilat ing and Heating apparatus, engines, motors, etc.

Send for catalogues and descriptive matter on any of the above lines that you are interested in.

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

THE STANDARD Ideal COMPANY LIMITED

GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

THE STANDARD Ideal

Automatic Individual Bowl Syphon Action Range Closet

The most perfect range closet ever produced.

Write for our Booklet "E"

showing our Range Closets and Urinals and giving roughing measurements.

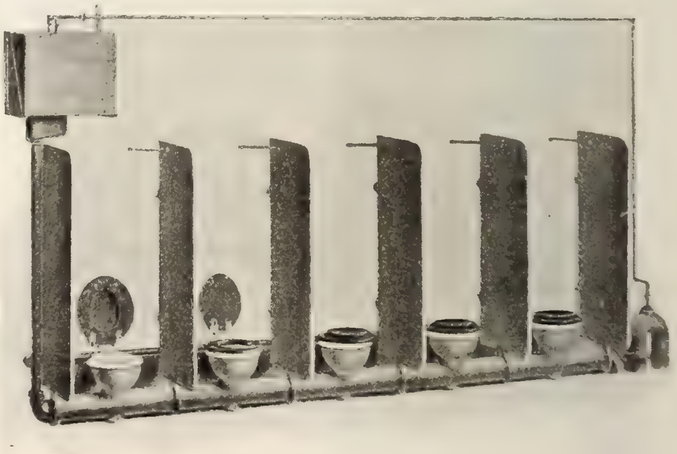


Plate F. 517

BRANCH OFFICES AND SHOW ROOMS
TORONTO
119 KING STREET EAST
MONTREAL
44 BEAVER HALL HILL
WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 August 9, 1911 No. 32

City Council Indiscretion

An alarming condition of affairs that recently put in an appearance in the city of Carbondale, Penn., with reference to the City Council's advertising for sealed proposals for the services of a consulting engineer to prepare plans for what it terms a comprehensive system of sewerage and sewage disposal, has recently been commented upon in an editorial way by the Engineering News. Bidders were required to submit cash or certified check for $50 with their bids, to be forfeited if they failed to enter into contract within 10 days from the award, and to complete the job within 60 days. Further, no money was to be paid the engineer for his plans unless and until they were approved by the Pennsylvania Commissioner of Health.

The bids that were received were opened on July 10 and were eight in number. According to this contemporary the list was as follows, the names of bidders being omitted:

(A) Complete design, including all necessary surveys, maps, plans, etc.; $1,250 plus travelling expenses, or $25 per day and $10 for assistant.

(B) Complete design, plans and specifications; $800. For surveys, maps, etc., $20 per day.

(C) Complete design, plans and specifications, $500.

(D) Complete design, including all necessary preliminary surveys, report, maps, plans, specifications, etc.; $780.

(E) Complete design, plans and specifications, no surveys; $539.

(F) Complete design, as per advertisement; $972.

(G) Complete design, including surveys; $1,175. If City Engineer makes surveys deduct $225.

(H) Complete design, maps, plans, specifications, reports, surveys, etc.; $900.

It is noted that the bidders, except (D) and (E), enclosed a certified check for $50 with their bid. (E) wrote a very dignified letter to the members of the council to the effect that their request for a certified check was unprofessional. The contract was awarded to (D).

In a letter concerning this scheme one of the bidders stated that the party to whom contract was let was a man whose engineering training was obtained for the most part in a rolling mill, and whose engineering practice has been the sale of vacuum sweepers, although recently given to the guaranteeing of odorless sewerage purification, without any attention to the apparatus on the part of the operator, however irregular the influent.

The laws of Pennsylvania require that such work shall be advertised and let by competition to the lowest responsible bidder.

This instance of selling engineering services by auction should be sufficient incentive to engineers to at once provide an effective remedy in order that their interests may be protected from the dictates of civic authorities who are elected into office with little or no knowledge as to what competent engineering advice is. In so doing engineers will not only do themselves a justified service but will prevent serious injury to municipalities in general.

An incompetent designer of a sewage disposal plant may make blunders which will cost the city many thousand dollars to remedy. We make this statement advisedly with knowledge of cities which have had to spend hundreds of thousands of dollars on their sewerage systems which would not have been necessary had the work been more intelligently and ably planned at the start. Much more than the ability to compute pipe capacities and outflow volumes is needed to fit an engineer to design a sewerage system wisely.

Why should not engineers associated together for mutual benefit do for themselves collectively what no one member of the profession, however influential, can do alone? It would require radical reorganization of our engineering societies and shaking of some dry bones, it is true; but is that a strong argument against it?

It would seem that an investigation would bring to light a number of ways in which the engineering profession could educate the average city council as to how to select a competent engineer for authoritative unbiased advice, without this disastrous punishment being reflected upon themselves.

Investigators of Civic Conduct

Bureaus of Municipal Efficiency have been tried in several cities of the United States and their reports would indicate that the experiments have in all cases been successful. They generally have for their purpose the promotion of efficiency and economy in the conduct of municipal business, and to this end they study methods by which the different departments of civic organization carry on their work, with a view to recommending such changes as may appear necessary. Such a bureau has been defined as "An institution designed to introduce into public administration the most economical methods of private business, to prevent waste and to provide an effective agency of citizens' enquiry, to ascertain exactly how the public business is being transacted, to bring this information to the public in a digestible form, and on the basis of exact knowledge to assist city administration in increasing efficiency."

The bureau has outlined its objects and its methods of procedure to be as follows:

Specific Objects of the Efficiency Bureau

1. To ascertain the powers and limitations of each city official; to eliminate conflicts of power and administrative jurisdiction, and to suggest methods of preventing waste and inefficiency.

2. To aid public officials in securing the information necessary to effective administration; to preserve such evidence of transactions as is necessary to locate responsibility, and to inform the public of service performed and the cost thereof.

3. To scrutinize the general system of accounting and make constructive suggestions for improvement.

4. To examine the methods of purchasing materials and supplies and the letting of contracts.

5. To improve budgetary proceedings and assist those who make appropriations in securing that classified and exact knowledge which is necessary to prevent carelessness and waste in appropriating the public funds.

6. To furnish the public with exact knowledge regarding public revenues and expenditures and thereby promote efficiency and economy in public service.

Methods of Procedure

1. Confer with public officials and secure their co-operation and that of their subordinates in remedial work.

2. Prepare a digest of the powers and duties of the department or office by an examination of the statutes, ordinances and rules pertaining thereto.

3. Prepare a chart of each departuent or office showing lines of authority.

4. Examine the public records, analyze the information contained therein, and make collateral inquiry concerning matters in which the records may be defective.

5. Compare functions and expenditures with work accomplished and results obtained.

6. Hold frequent conferences between members of the Bureau's staff and also between the latter and public officials on methods used and facts disclosed.

7. Submit formal report to officials on organization, powers, duties and present methods of business procedure.

8. Submit critical report to officials and general public containing constructive suggestions and procedure incident thereto.

9. Continue educational work until something definite is done to remedy unbusinesslike methods disclosed. Assist officials in installing new systems recommended by the Bureau, or change in former systems.

10. Support publicity by verifiable data, illustrations, budget exhibits, etc.

A pamphlet recently published on the work of these bureaus comments lengthly upon the results obtained by the New York Bureau of Municipal Research which is credited with having saved the city several millions of dollars, some of the largest items of this being $400,000 from the Dock Department budget and $300,000 to $500,000 from the Fire Department budget. This bureau has reorganized from top to bottom departments of Finance and Accounts, Division of Child Hygiene, Bureau of Licenses, Revenue control in Water and Park departments, Bellevue Hospital clerical staff and the control of violations of the Tenement House department. It has revised the city's accounting system, budget making methods, the method of computing school repairs and the city's debt, and the real estate bureau's records. It refers to the fact that ex-Comptroller Metz has donated a fund of $30,000 to encourage the introduction of accounting methods in other cities similar to those this bureau has introduced in New York.

There is no doubt that the efforts of these organizations may accomplish a great deal of good, especially where the criticism is of a constructive rather than of a destructive nature. Criticising the head of a department for inefficiency is a very much simpler matter than improving conditions that may be found to exist. Very often a department may be as efficient an organization as conditions will permit, but valuable results may be marred by influences beyond its control. Where incompetency is found, co-operation on the part of the department itself to secure greater efficiency will usually result in a speedy improvement. This of course is the ideal case, but the investigation committee should be prepared at times to meet opposition from the department that is being studied, and this is the condition which will necessitate the employment of considerable tact.

The costs of maintaining the bureaus in the several cities have been as follows: New York, $91,470, $87,660, $100,000 in 1908, 1909 and 1910, respectively; Chicago, $55,000 in 1910; Philadelphia, $25,000 and $30,000 in 1909 and 1910, respectively; Cincinnati, $35,000 in 1910; Memphis, $12,000 in each of the years 1909 and 1910; Milwaukee, $25,000 in 1910. In New York the greater portion of the expenses is contributed by about one dozen citizens, although there are between 100 and 200 smaller contributors. In Chicago, fourteen men subscribed $114-000 and an additional $3,000 was sent unsolicited, this sum to carry the work through two years. The Philadelphia bureau is supported largely by the contributions of a small number of men as is the case in Cincinnati.

Milwaukee appears to be the only city which supports a Municipal Efficiency Bureau by public funds, $25,000 being appropriated for this purpose. Professor J. R. Commons is in charge of this particular bureau and has every assistance that experts in engineering, accounting, and organizations of labor, business and municipalities can give. It is now carrying on two lines of investigation. The first is a social survey to determine the hygenic problems of the city, housing conditions, industrial accidents and other things to show how far the city government is utilizing its resources to promote the health, welfare and happiness of the people. The second line of investigation is an efficiency survey, to ascertain the character of the organization, administration, accounting, financial methods, business practice, construction and operation in the municipal departments. The purpose is two-fold, to improve the efficiency of the local government and to reveal the defects in the existing system. It is a far more difficult task than efficiency work for a private corporation because city affairs must be conducted in accordance with many laws and by methods which are not always direct and free from red tape. The compilation of the requirements in the charter, state laws and city ordinances has proved no easy task, and it has revealed many contradictions; these requirements must be clearly defined, however, for they govern a part of the procedure of every city department. The remaining part of the procedure is being studied by organization charts, which also indicate the legal regulations, and in this way the existence of cases of inadequate supervision and indefinite responsibility are being studied. The city accounting methods are being investigated and improved at the same time. Every detail of organization, administration, operation, business methods and accounting of each city department is being studied, and improvements are being sought, but before these are finally introduced they are criticized by the advisory experts and discussed with the department concerned. Special attention is being paid to the introduction of methods of cost accounting which will be helpful in increasing the efficiency of the force.

Columbus Housing Code

A new housing code has been passed in Columbus, Ohio, that marks a new era in building in that city. Columbus has long been known as the best built city in the United States. Being the centre of the great brick producing districts, brick has long been very cheap and the most used of all building material in the city. Now, however, the housing code proposes to make the city more beautiful and more healthful and more sanitary.

The ordinance provides for regulation of the erection, construction, use, control, maintenance and repair of buildings used for human occupancy or habitation, the number of occupants and the mode and manner of occupancy, for the purpose of securing the healthful, safe and sanitary environments of the occupants thereof, and to compel the owners of such buildings to alter, construct or modify the same, or any part thereof, for the purpose aforesaid, and to prohibit the unlawful use or occupancy of such building or buildings.

In the code, a "tenement house" is defined as "a house or building, all, or any portion of which is rented, leased, let or hired out to be occupied or is occupied, or is intended, arranged or designed to be occupied as a home or residence of two or more families living independently of each other and doing their cooking upon the premises and having a common right in the halls, stairways, yard, cellar, water closets or privates, or some of them, and includes apartments houses."

One of the strict provisions in regard to which there was bitter fight is in regard to the percentage of the lot occupied. In case of corner lots, not more than 75 per cent. of the lot may be used for a building; in the case of corner lots with streets on three sides, not more than 80 per cent; of interior lots not more than 50 per cent. Outside stairs, fire escapes, porches and platforms shall be considered a part of the lot occupied.

No tenement house or dwelling house shall exceed in height the width of the widest street upon which it stands. Behind and immediately adjacent to every tenement house or dwelling there shall be a yard extending across the entire width of the lot and at every point open from the ground to sky unobstructed. In case of tenements, such yard shall never be less than 18 feet in depth. In case of dwellings not less than 10 feet.

The size of all courts shall be proportionate to height of the building. The minumum width of a court for dwelling house shall be five feet for a two storey building and an increase of one foot for every additional storey. In every tenement house and dwelling house, except water closets and bath rooms, in each department there shall be at least one room containing not less than 150 square feet of floor space and each other room shall contain at least 100 square feet. Each room shall be not less than 8½ feet high. Every room shall have a window. No basement may be used for living purposes. Every house must be provided with running water and sewer connections.

No tenement house shall hereafter be erected exceeding three storeys in height, unless it be fireproof. No closet may be constructed under any staircase. There must also be fire walls constructed where dwelling houses are built in the form of double houses or terraces.

The buildings must be maintained by the owners. Lights must be provided in the halls. No water closet shall be maintained in the cellar; hallways must be kept clean; receptacles provided for ashes and garbage and rubbish.

There are many provisions to safeguard the people and it will affect numerous old buildings in the city which will have to be torn down or remodeled.

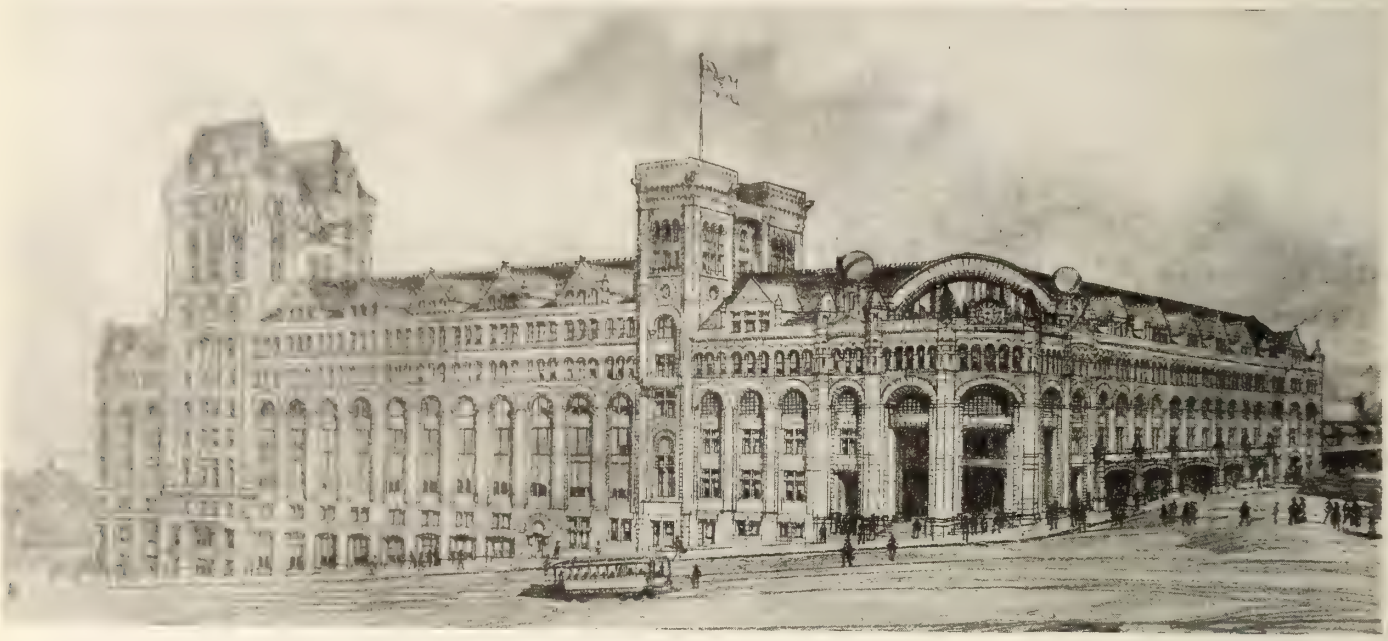
The Woolworth Building

A new building, which will be higher than either the Singer or Metropolitan towers, and will be exceeded in height only by the Eiffel Tower, is to be erected in New York. It is to be known as the Woolworth Building, and will rise to 775 feet above the curb. It will have a frontage of about 155 feet on Broadway, and a depth of about 200 feet. The foundations will be carried down to solid rock, 110 feet below the curb. On the Broadway front a large tower, measuring 84 feet by 86 feet at the base, begins at the 31st floor, and is carried with vertical walls to the 42nd floor, where the dimensions are 69 feet by 71 feet. It is then continued to the 47th floor, where the measurements are 59 feet by 61 feet, which continue until the 50th floor. From the 31st to the 50th floors the tower is 270 feet in height, and at this elevation it is surrounded by a pyramid, 105 feet high and 54 feet square, containing the five highest floors, and an observation gallery situated 730 feet above the street level. There are only two storeys below the curb. The height of the individual storeys varies between 12½ feet and 20 feet, most of them being 12½ feet. The steel framework will contain about 20,000 tons of metal. The exterior walls will be of granite up to the fifth floor, and of terra-cotta above that height, and the partitions will be composed of hollow brickwork 8 in. thick. The building will be equipped with 26 elevators. It is designed in accordance with the New York building code, which allows 150 lbs. per sq. ft. on the first and basement floors, and 75 ft. on each of the others. A uniform wind pressure of 30 lbs. per sq. ft. over the entire surface of the building is provided for.

The Department of Marine and Fisheries have called for tenders for the construction of a reinforced concrete tower and fog alarm building to be built at Point Atkinson, B. C.

The New Windsor Station in Montreal

Canadian Pacific Railway Station and Head Office—The Highest in Montreal — A Discription of the Building



A great deal has been said and written about the new station and head offices of the Canadian Pacific Railway Company at Montreal, but its vastness is better expressed by photograph than by word picture. The future home of the C. P. R. will have a frontage of 493 feet on Windsor street, 550 feet on Osborne street, and 175 feet on St. Antoine street. The rest of St. Antoine street, and Mountain street, between St. Antoine and Osborne streets, will be occupied with trackage and other plant. The ground floor area of the station will be 77,000 square feet, and the whole floor area of the building will be 450,000 square feet.

Montreal has several ten-storey buildings, but this will be the first real tendency towards sky-scraping. It will have three heights at different points. At the corner of Osborne and Windsor streets it is 69 feet; at the corner of St. Antoine and Windsor, 120 feet; while the tower, which is situated a short distance north of that corner, will rise to a height of sixteen storeys, or 214 feet above the pavement. While not all working under this roof, there are 12,000 people residing in Montreal who are in the employ of the C. P. R. The first C. P. R. station with offices in Montreal, was erected in 1889. The present undertaking is the fifth extension to the company's terminal accommodation in Montreal, and will make this the largest and most complete railway headquarters in Canada. The last rivet was driven on the steel work at the top of the new tower a few days ago. The steel frame was manufactured and erected by the Dominion Bridge Company. Over 5,300,000 pounds of steel have been put into the structure. The stone facings have been built up to the fifth floor, while the concrete flooring is being put in at a rapid rate.

The main entrance to the present station is on Osborne street, a little west of Windsor street. Alterations will be made at this point so as to have the entrance at the corner of those two streets, as is shown in the foreground of the accompanying reproduction. There will also be a main entrance at the corner of St. Antoine and Windsor streets. Entering from the St. Antoine corner the main floor may be reached either by two large elevators or by marble stairways on either side of the doorway. These will give direct entrance to the "concourse" on the upper floor, which will be 350 feet long and 60 feet wide. The new general waiting room will be 130 feet by 60 feet, and 26 feet high. The ladies' waiting room and retiring rooms will be large and elaborate, with nursery, and both free and pay toilet parlors. The dining room accommodation and culinary facilities will be of most modern and approved plan and equipment. There will be a total of eleven elevators in the building, the power plant for which will be in the basement of the extension.

Mr. C. E. Deakin is the general contractor for the station extension; the foundations were put in by The Foundation Company, Limited; Messrs. Byers & Anglin are the contractors for the viaduct and power house between the station extension and Mountain street; The Duckworth-Boyer Engineering & Inspection Company, Limited, were the inspectors for the steel work. The designing and drawings were made in the offices of the C. P. R. architect, Mr. W. S. Painter, and the erection is proceeding under the supervision of Mr. F. L. Ellingwood. The building will be ready for occupation early next year.

Cost Keeping for Contractors

The importance of cost records on construction work has been pretty generally realized by contractors during recent years and most concerns engaged in work large enough to warrant it have adopted some system by which all expenses on any contract may be determined and classified among a number of accounts, forming permanent records of considerable value. These are of use not alone as a basis for future bids, or as a means of determining the cost of each class of construction from day to day, but as accurate records in case of litigation, especially in the matter of extra work. The system of contractor's cost keeping and organization in use by Charles Cranford, a general contractor of Brooklyn, N. Y., was described at a recent meeting of the Brooklyn Engineers' Club by Richard L. Russell, who discussed its advantages and explained the use of a number of printed forms used both in the field and in the office in connection with the Brighton Beach improvement work, involving excavation and concrete.

Degrees of Fineness

The degree of fineness into which the work is to be subdivided is one of the important factors in any cost-keeping system; the records dealt with by Mr. Russell are intended solely for the use of the contractor who through constant oversight of the work is so familiar with the conditions that few explanatory notes are needed in connection with the costs. Each foreman, under this system, is furnished with 5½ x 8½-in. blank daily report, containing six ruled columns; the first is headed "Employee's Number," and four are headed "Hours and Amount," the sixth column being used for the total. The laborers' numbers and the hours at each class of work are entered and the total summed up in the last column at the end of each day. Space also is left for remarks. With such a form a man's time may be classified according to the different kinds of work he may have done during the day. The foremen also report the daily yardage of excavation and concrete and material received.

The reports are inspected by the superintendent and if they give the information and cost distribution desired, are sent to the storekeeper, who enters the cost and quantity on a "daily statement." This sheet measures 9½ x 12 in. and contains after each foreman's name, under the heading "Excavation" or "Concrete," the total cost for the day, the daily yardage and the cost per cubic yard. Space also is left for entering up the value of materials received and the grand total under each classification is summed up at the bottom of the sheet.

Transfer of Quantities

The quantities from the daily statement are in turn transferred to monthly statement sheets which measure 17 x 14 in., and are ruled so that entries may be made upon them for 31 days' work. On these sheets there are a large number of classifications; for example, the classifications under "Excavation" include work done by buckets, by orange-peel buckets and by hand. There are columns under which charges may be made against moving and maintaining buckets, derricks, boilers and engines, and oil and fuel.

The second of the monthly statement heads covers transportation charges, the third timber work, and the fourth concrete. Classifications on the latter are as follows: "Massive," "Concrete," "Reinforced Concrete," "Arch Concrete," "Foundations and Drains," "Facing Walls," "Forms," "Cement" and "Conduits." Under each of the first four main headings there are three subdivisions labeled "Mixing and Placing," "Cubic Yards Placed," and "Cost Per Cubic Yard."

In addition to the cost of the work in the field, administration charges are made under the following heads: "Engineering and superintendence, timekeeper and storekeeper, general office force, telephone and office supplies, liability insurance, surety bonds and legal expenses, rental of yards, office, etc., watchmen, interest, depreciation on general plant and miscellaneous small tools, interest and discount." The daily general expense, under this system is proportioned by the engineer among the various items and included by the storekeeper in making up the daily statements previously referred to.

Requisition of Materials

Requisitions for materials are made by the storekeeper and submitted to the engineer for approval. If approved, orders are made out in triplicate on forms of three colors for ready identification, the original going to the manufacturer or dealer, the duplicate to the storekeeper and the triplicate being retained in the main office. When the invoice is received it is forwarded to the storekeeper and checked against the original order and returned to the main office.

The voucher system is used in settling all bills and payrolls; the bills are enclosed in folded vouchers on the back of which are spaces for the name of the creditor, distribution of the amount, number, date of check, date of bank, and date on which the voucher was recorded and distributed. The regular cash book, ledger, journal and voucher book are kept. In the latter the horizontal lines across the double page are numbered exclusively; one line to each voucher and the vertical columns contain, first, the number of the voucher; second, the total amount, and, third, the number of the contract and the amount to be charged against it. By this system the total amount of each contract is shown.

Sanitary Plumbing and Death Rate

At a recent meeting of the local council for the registration of plumbers at the University of Birmingham, Dr. John Robertson, the medical officer of health, lectured on plumbing in relation to public health. Among other things he said one of the most remarkable achievements of the nineteenth century was the great advance in the health of the people. For instance, that part of Birmingham which in 1851 had, roughly, a population of a quarter of a million, in 1910 had 870,000 residents. The death rate in 1851 was 26 per thousand, in 1910 it was 12½ per thousand; which meant that if the 1851 rate had continued there would have been 12,000 more deaths in Birmingham in 1910 than had actually occurred.

In addition to the great advance in the saving of life, there had been a great saving of sickness, and the unemployment and waste of expenditure that followed. Typhoid fever had almost been reduced to the vanishing point, and deaths from phthisis had uniformly decreased under improved housing conditions. He further stated that anything that plumbing could do to reduce dampness in houses should be done to further reduce the deaths from the white scourge.

Two tunnels and 24 bridges are required on the branch line of the Grand Trunk Pacific Railway, now under construction south of Edson to open up the Brazeau coal fields. The firm of Creelman & Verge, who have the contract for all bridges, will commence the work soon.

Building with Reinforced Concrete

Some Points That Govern Design—The Properties of Concrete Exemplified—Placing of Reinforcing

By M. C. Tuttle.

Failure to understand the general principles of reinforced concrete comes from the idea that the subject is technical and complicated; also from the scarcity of non-technical articles on the subject. A statement of the simplest theories may be of interest. Concrete buildings are becoming common enough, so that the use of the concrete column, the concrete beam floors, stairs and wall excites little comment. It is generally known that steel rods are used to impart strength and that these are generally used in tension, but just how and why are not always clear.

Take the case of a simple beam supported at each end and loaded in the middle. It will be seen that the bottom of the beam is being pulled and the top compressed; that if the beam fails, it will probably do so by tearing apart at the bottom, or if the bottom is tough enough and the load is increased sufficiently, the top of the beam will crush or crumple. In the case of a concrete beam the material is hard but not tough, and a sufficiently-loaded beam of this material will supposedly fail by tearing open at the bottom.

Designing a Concrete Beam

In designing a concrete beam the engineer finds how much tension a given load will cause on a beam of given length. Knowing this he has but to select the amount of steel necessary to resist this pull. It will be seen that the deeper the beam the less pull will be exerted at the bottom, and accordingly the engineer can increase the depth and use less steel, or decrease it and use more steel, to get a given carrying capacity. He must at the same time assure himself that the compression in the top of the beam is not greater than the concrete can bear.

With regard to concrete columns the problem in the simplest case is to determine how much load comes on a given column; to reckon on the number of inches of cross-section necessary to safely carry this load and to so arrange the steel in the sides of the column that the column shall not bend or bow under the load. It is clear enough that a long shaft —for example, a knitting needle standing vertically on a table—will carry more load when it is straight than when it once begins to bend; and in the case of a bending column, the side opposite the bend is stretched and the side toward the bend compressed. To prevent this stretch steel bars are generally placed on the outside of any concrete column. In the simplest case this is the sole function of the bars.

With these general principles in mind, one will understand that once a bar is imbedded in concrete it should become a part of a composite structure, of which structure the concrete should be in compression, and the steel in tension, under load. If, however, a round bar was thickly coated with grease, so the concrete could get no hold on it when enough load was applied to a beam to tear the concrete at the bottom instead of taking up the pull, the bar would simply slip through the hole in which it was embedded.

Grip of Concrete on Steel

It has been found that the grip of concrete on steel is very strong. To satisfy yourself of this, embed the ends of wires in cement mortar at varying depths and at the end of three weeks try to pull them out. It is generally accepted that a plain steel rod with one end embedded in good concrete forty times as deep as the diameter of the rod will pull apart outside the concrete rather than slip from the concrete. It will be seen that a number of small rods will offer more surface hold to the concrete than does one large rod of equal cross section.

The average concrete building has more than one span of beams in its width, and it is to be noticed that the beams are in one solid piece across the width of the building—not separate beams between columns like the wooden beams in a mill building. If you consider the case of a concrete beam carrying load and supported by a column, you will see the beam will tend to break apart over the column by tearing at the top, just as a stick breaks across your knee; that is, the tension at this point has changed from the bottom of the beam, where it was in the middle of the span, to the top of the beam at the column. You will see that for some distance each side of the column tends to project, like the arms of a cross, and that at some point beyond it tends to hang like a hammock from the point where the arm of the cross ends and the beam changes from tension to compression. It is to take up this top pull over bearings that the beam bars are bent so as to bring the last two or three feet of bar into the top of the beam. It will be seen that if these ends stop at the centre of the column it would have much the same effect as making the horizontal arms of the cross of two pieces instead of one; it would not be so strong, and if the steel were all at the bottom it might be compared to bringing the arm at the botton when made of two pieces.

Support of the Slab

In a concrete beam and slab floor the slab is supported by the beams and would tend to crack under the load either by crushing at the top or by pulling apart at the bottom about midway between the beams. It would act much as a slab of slate would if it were loaded to breaking. The steel, accordingly, is put at the bottom of the slab to take up the tension, exactly as it is in the case of a beam. The slab, in fact, is nothing but a thin, flat, continuous beam, and the steel bars or mesh is arranged as nearly as may be like that of a beam or girder. There is a point a little distance away from the beam where the top of a slab is in tension exactly as the top of the beam is in tension over a column. Some engineers bend the slab steel so as to get it into the top of the slab at this point over the beam; others put in steel bars at right angles to the beam, extending beyond this point to take up the tension, and still others use small bars spaced a few inches apart, running both ways in the top of the slab for the purpose of taking up this tension, and also to tie the slab up to prevent cracking from internal strains in the material.

This leads to the consideration of the use of steel for preventing cracking. Concrete is cast wet and hardens into its place—in effect the same as cast iron hardens in its mold; and just as cast iron is full of internal strains caused by unequal cooling and unevenness in the metal, so the mass of the concrete is full of internal strains because of variation in time of setting, due to time of placing, the amount of moisture, the amount of heat and the rapidity with which it dries out, besides the unevenness which exists in the aggregate and in the cement. With cast iron it is possible to anneal this and so remove the internal strains. With concrete, however, it is only possible to tie the mass together with the tough steel so that under shock, under uneven loading, or in the racking of changes of temperature, the material will hold together and not show cracks.

Amount of Steel Necessary

The authorities disagree somewhat as to the amount of steel necessary to tie the mass of concrete together, some engineers claiming that with the use of enough steel a solid wall of concrete could be built of indefinite length without danger of cracking others believing that the length of concrete sections, however much steel there may be in them, should not continue indefinitely, but should be broken with contraction joints. It has been found that concrete and steel increase and decrease in length under the action of heat and cold to almost the same amount. Hence the two materials will work together and the steel holds the concrete rigidly, even under temperature changes. It would seem that steel would hold concrete against cracking under temperature changes. For this purpose, steel bars are commonly embedded near the faces of concrete walls horizontally to prevent vertical cracking. The danger of horizontal cracking is less both because the vertical dimension of a wall is commonly much less than the horizontal dimension and also because the weight of the material bears down on all parts of the wall and tends to compress the various particles of the concrete rather than to tear them apart. It is, however, common to use more or less vertical steel in walls as a precautionary measure.

In building brick or stone foundations for a building it is common to start with a layer of wide stones or a wide footing and to step this in like the sides of a pyramid so that the load from the walls will be spread over the entire bottom course. If a slab of concrete is placed on the earth and the weight of a wall brought upon the middle of this, it would be seen that if the ground gave a little under the load the concrete would tend to tear apart immediately under the edge of the wall and to allow settlement. If, however, steel rods are embedded in the bottom of such a broad footing at right angles to the wall, any tendency to tear the concrete apart at the bottom will simply bring the rods into tension. This principle is commonly used in concrete foundations. Where the columns come onto a footing the footing may be made square with the steel running two ways, or octagonal with the steel running four ways across the bottom in the concrete. Again, it will be seen that the concrete acts wholly in compression and the steel in tension.

Size of Concrete Columns

Objection is sometimes made to the size of the ordinary reinforced concrete column, and to overcome this objection vertical steel bars are sometimes used to carry part of the load. Builders are not altogether a unit on the advisability of using such vertical steel bars to carry part of the load, the argument against it carried to an extreme being something like the following: If you should support a weight on a long cork, the cork would undoubtedly compress under the load and at some point would allow the load to sink no further. If you ran two or three steel needles through the cork, cutting them off flush with the top and bottom and applied the weight again, the cork would take up very little of the load, the steel needles supporting it entirely, because the cork is more elastic than the steel.

Now, good concrete will carry 2000 lbs. to the sq. in. of cross section, while steel will carry 60,000 lbs. per sq. in. of cross section. Every material compresses somewhat under load, just as the cork used in the illustration does, the difference being that the compression in steel is very much less. Some experts claim that because the two materials under a given load do not share the compression equally, the concrete as a more elastic substance would have to be compressed beyond the point allowed by its physical structure before the steel would get anything like its full load. Others claim that as the concrete compresses much of the load is carried into the steel and that the two materials work evenly together. It can at least be said that practically all the tests on columns indicate that vertical steel bars do increase the carrying capacity of the columns. In considering column reinforcement, however, one must distinguish between the heavy vertical steel bars used to carry load and the smaller steel bars placed near the outside of columns to keep them from bending under their load, as explained in a former paragraph.

It will be seen that if the vertical steel bars used for carrying part of a load should be loaded heavily enough, they would tend to bow out, just as the knitting needles, previously used for illustration, under load tend to bow under their load. Accordingly, it is common to use bands of small steel just outside the bars to prevent this bowing under extreme load and also to hold the vertical steel bars in place during the pouring of the concrete.

Illustrating Effect of Reinforcement

If you stand an ordinary square-ended rubber eraser on end and press down hard on its top, you will see that the length of the eraser is shortened by the weight and also that the horizontal dimensions increase, that is, the eraser bulges in the middle. If the eraser were wound close with wire, this would hold all sizes of the eraser from bulging, and under the same amount of compression the length of the eraser would not decrease as much. Allowing for the difference in elasticity in the eraser and a concrete column, it is to be understood that the same general results occur in less degree in a concrete column that occur in a rubber eraser. Under sufficient load the particles which make up the concrete column would tend to slide by one another, so to speak, and to bulge the column, and as these particles are not as elastic as the particles of rubber, beyond a certain point they will not return to their relative positions, but will leave permanent cracks between the particles. The slipping of the different particles on one another can be seen readily in the case of a pile of sand, where under a load applied over a small area the particles of sand simply slip by one another out from under the load, and there is very little supporting capacity. Confine the same sand in a metal tube; compact it will and it will carry a tremendous load, because the particles cannot slip by one another, but are held firmly by the metal tube.

Reinforcement for Columns

This principle is commonly applied to the concrete column, some builders using horizontal hoops made of small bars placed just within the surface of the concrete, others using a spiral hooping that runs round the perimeter of the column inside the concrete. Experiments show that hooping increases the strength of a column tremendously. On practically any job to-day where concrete beams are being used, one may see small bars bent practically into U-shape standing up at right angles to the tension bars in the beams and girders. These bars are generally referred to as "stirrup bars." It has been found that when a concrete beam is loaded to the point of failure, cracks are likely to develop in the beams, starting at the bottom and running roughly at an angle of 30 deg. away from the point of support. These are referred to as shear cracks or diagonal tension cracks.

There is considerable disagreement among builders as to the exact function of the stirrup, and there is probably more uncertainty about their actual value than of any other feature of modern concrete design. In general terms they are put in to prevent this cracking, and by so doing to add strength to the beam. Some claim that these shear bars act with the concrete and with the tension bars of the beam, like the tension members of a truss, with the concrete between the bottom of one and the top of the next stirrup bar acting as the compression member.

Use of Stirrup

After careful investigation one is led to the belief that builders look favorably upon the stirrup; on the basis that it probably does some good and certainly cannot do much harm. It is probably safe to say that very satisfactory beams can be built without stirrups, and it will probably be necessary to wait further development of the theory of reinforced concrete design before the last word will be said regarding the necessity of the stirrup.

A new type of floor has come into prominence in the last few years, largely through the invention of C. A. P. Turner, of Minneapolis, Minn. This is the so-called "mushroom" or "girdless" type of flat slab floor. In this construction the caps of the supporting columns are usually increased in bell-shaped form below the ceiling line of a given floor. Over this cap the steel bars of the flat plate of the floor are carried at right angles from one column to the next column, and also diagonally across the slab from the columns at the opposite corners. These steel bars rise to the top of the slab at the columns, are near the bottom of the slab in the middle of the bays and are embedded in a fairly thin slab of concrete. It has been found that an absolutely flat slab of only 8 in. to 10 in. thick will carry a proper working load over a square bay with a column spacing of 25 or 25 feet. The advantage of the flat ceiling and thinner floor is obvious enough from the operating point of view.

New Floor Construction

Aside from the articles and book by Mr. Turner, of Minneapolis, the only technical treatment of this subject that we know of being yet published is the paper by A. B. MacMillan, of the Aberthaw Construction Company, Boston, Mass. The writer of the present article has no desire to attempt an explanation of the theory of this floor construction; about all that can be said is that experiment has shown it to be very strong and quite satisfactory.

It can be said in general that because the steel runs in the top of the slab over the column, and remains in this position for a considerable distance beyond the column, it is sure that a circle of concrete is supported by the column, much the same as the top of an umbrella is supported by the shaft; and that from the edge of this circle the piece of the slab is supported like a simple beam by the steel extending from the edges of this and the corresponding circle of concrete at the next column, and that if the whole concrete slab should fail, the steel bars clamped in position by the weights coming down the column above would hold like the strings of a hammock. It is also probable that the concrete between the different bands of steel acts like a flat arch, adding greatly to the theoretical strength of the construction.—The Building Age.

The Revision Was Impartial

A letter from another member of the Citizens' Committee, for the revision of the Toronto building code, is reproduced below. The committee is showing no laxity, despite the press of business interests in the middle of the building season, and numerous letters received by this office from interested builders bear this out. It is reported that the by-law is at present undergoing a revision, the thoroughness of which will in all probability be made evident in the early appearance of the revised edition.

A number of factory and office building in contemplation in the city are being held back, until a decision has been reached. These include a ten-storey office building of reinforced concrete to cost about $125,000, to be erected on Adelaide street west, that will not go on until a revision has been affected.

The following letter presents a few points, which in the meantime those who are contesting for a better by-law would do well to keep in mind.

Editor, Contract Record:

I have noted with a great deal of interest reports in your publication regarding the application for the revision of the Toronto Building Code, and also the stand taken by the City Architect, Mr. Robert McCallum.

It is to be regretted that Mr. McCallum took so positive a stand before he had time to study this application carefully.

I am sure that this committee of which I happen to be a member, could not have undertaken a task of this kind and shown any greater fairness toward all building material. Mr. McCallum stated that building by-laws are usually favorable to some special kind of construction and yet that this report is especially favorable to reinforced concrete construction.

Until recently nearly all city ordinances discriminated against the use of reinforced concrete or concrete in any form. No other material has been, or is now, discriminated against as much as concrete. Most building ordinances are more definite in this respect than any other, and for that reason it is but natural that a report of this kind should devote more space to the subject of concrete than that of any other building material.

If it had been the intention of this committee to especially favor reinforced concrete, there would have been no object in calling attention to the section of the present by-laws covering the safe loads per sq. ft., specified in the by-law for brick masonry. The present by-law calls for 3 tons per square ft., for kiln run bricks, laid in lime mortar; 5 ton per cq. ft., for ordinary brick laid in Portland cement mortar; and 6 tons per sq. ft. for hard brick laid in lime mortar.

In the application the following has been recommended.

Character of Masonry	safe load per sq. ft.
Kiln run bricks laid in lime mortar	4½ tons
Ordinary brick laid in Portland Cement mortar	7½ “
Hard brick laid in lime mortar	9 “
Hard brick laid in Portland Cement and lime mortar	13½ “
Lime brick laid in Portland Cement mortar..	18 “
Pressed brick laid in lime mortar	12 “
Pressed brick laid in Portland Cement mortar	21 “

In other words the maximum allowable load would be increased from 6 tons per sq. ft. to 18 tons per sq. ft. for hard brick.

In the very first pages of the printed application, attention is called to the fact that the attitude taken throughout by the committee was not one of antagonism to the architect, but rather to assist a department which, on account of the duties it has to perform, must always be subjected to much adverse criticism.

One feature of the present by-law which seems too conservative, is that covering the thicknesses of curtain walls. In buildings where curtain walls are used most of the load is carried by the columns and the curtain walls merely fill in the intervening spaces.

The present by-law also seems to place a premium on non-fireproof construction, not in actual wording, but certainly in effect, as it makes the cost of fireproof construction so high as to be almost prohibitive.

The above represent only a few of the points touched upon in the application, and anyone studying the code carefully will see that the revision asked for in these cases is very fair.

Comparison of Materials for Conduits

Clay, Fibre and Concrete—The Advantages and Disadvantages of Each for Encasing Signal Wires *

By W. K. Sparrow.

Clay conduits consist of two types, the single and the multiple duct, either square or round bore. This class of conduit is formed and vitrified, and then glazed by the salt process. The single duct type is made in 18-in. lengths, and the multiple duct type in 36-in. lengths. This material weighs about 8 lbs. per duct foot for the 3½-in. size.

Advantages.—(1) This class of conduit is, perhaps, to-day, the lowest in price, f.o.b. factory, of any of the classes which are mentioned. (2) When properly vitrified and glazed and free from iron, burrs, holes, etc., it is a high insulating material. (3) It has the advantage of long life; in fact its life is indefinite.

Disadvantages.—(1) If not properly vitrified, glazed, etc., or if it contains iron to any extent, the insulation is lowered. If not properly glazed it will absorb moisture and as the weight per foot is high compared with other classes of conduit, the amount of moisture absorbed is higher per foot. (2) Short lengths increase the number of joints over other classes, and as the ends are squared a gap is left over 18 ins. or 36 ins. which must be closed with other material. This method of construction naturally removes the advantage of high insulation claimed for this material. (3) Multiple duct, in addition to the above disadvantages, allows communication between ducts at the joints every 36 ins., thereby decreasing the safety factor of the cables. The single duct, although costing more to lay than the multiple, provides a greater safety factor. (4) Owing to the weight of the conduit the freight per duct foot is higher than other classes. (5) The loss in leakage has to be considered, as generally a break causes a total loss of the length, which, is a four-duct conduit means 12 ft. It is false economy to try to trim up the conduit, as the labor is generally more than the value of the material. (6) The cartage and hauling charges are comparatively high, owing to its weight. (7) A better and higher-paid class of labor is necessary for installing clay conduits than for other classes. (8) A large percentage of the conduit warps in vitrifying, and owing to its low selling price it cannot be furnished true to square ends, straightness, lack of blow holes, or burrs, and with thorough glazing. (9) The possibility of abrasion to cables, either at the joints or by sharp projections inside, gives clay conduit no advantage over iron pipe. (10 Although some manufacturers furnish bends they are not generally used in subway construction, it being considered advisable to install short radii curves or angles by means of manholes or hand holes, rather than run the risk of abrasion to the cables in pulling them under such conditions. The use of manholes naturally increases the cost of construction.

Fibre Conduit

The next step was the use of wood pulp in conduit manufacture. The first type, perhaps, was that of the pressed wood pulp formed cylindrically and treated with a bituminous compound. This process was abandoned by the originators, owing to the liability of disintegration when placed underground. Later wood pulp wrapped in a minutely thin film upon a forming mandrel, under pressure, was formed cylindrically and after drying was indurated with a bituminous compound. Joints of the screw, sleeve and mortise and tenon type were cut on the ends in order to connect the lengths. Another type is that

---

* From a Paper Read before the Railway Signal Association.

made by winding paper on a mandrel and indurating during the process of manufacture. The latest of this class is the return to the pressed type with a bell and spigot joint.

Advantages.—(1) The conduit is of light weight, varying from 1.2 lbs. per foot to 3.5 lbs. per foot for the 3-in. size. according to the thickness of wall and type of joint. The light weight naturally reduces the freight, cartage and handling charges. (2) This material has high insulating qualities, but no higher, perhaps, than the vitrified clay in itself. (3) It makes a continuous duct without the objectionable open joints of wood and clay conduits. (4) It can be made up in bends and other fittings to meet the requirements, and thereby reduce the number of manholes or hand holes of other systems. (5) If broken it can be recut, thereby reducing the breakage charges to a minimum. (6) It requires a less expensive class of labor than other classes of conduits, but requires the education of the men to the fact that the material is light and easily broken. (7) It can be installed at a total cost of construction as low or lower than other materials. (8) It will not injure the cables by abrasion. (9) It better protects the cables from stray currents. (10) It eliminates hysteresis losses when used in alternating current installations.

Disadvantages.—(1) Being a new class of material and liable to injury in handling, as well as possibility of injury by picks, etc., more care must be used than in any of the other classes. (2) Liable to unwind or disintegrate if not properly made. More easily affected by heat and climatic conditions than types previously mentioned. (3) It is affected to a certain extent by oils and is liable to destruction by fire from short circuits, although it is claimed that the combustion stops when the short circuit ceases. (4) This material has less mechanical strength than any other class. (5) The life of the material is in question. It has been in use for 15 or 18 years, and as a guess it might last 50 or 100 years.

Concrete Ducts

This class consists of two types. The first brought out was the duct formed and covered at the factory with sheet iron, which cover was later abandoned on account of its short life and the difficulty encountered in cutting the material on the work into short lengths. Later came the manufacture of this duct in the trench by the contracting company, and after this came the monolithic types, formed in the trench, using covers of concrete for the top and divisions; or, by means of rubber or paper tubing filled with water or air to act as the form while the concrete set. When the concrete had set these forms were removed, leaving a complete monolithic structure.

Advantages.—(1) It is claimed that the installation of this class reduces the cost of construction and gives a continuous duct without joints, and a flexibility not obtainable in the other classes of ducts. (2) The bore of the duct is smoother, reducing the liability of abrasion to the cables. (3) The cutting down of freight and cartage costs to a considerable extent. (4) Practically indefinite life.

Disadvantages.—(1) A higher cost of construction for the reason that a grout mixture has to be used, thereby making a more expensive composition than a mixture of concrete. (2) Great care must be used to get a smooth bore and a construction which is not porous. (3) Some engineers claim that a chemical action takes place between the concrete and the lead cable, but my experience is that the action is so slight as not to be worthy of consideration.

This class of conduit has not been generally accepted by the larger companies and it is reasonable to assume that it has proved to have no special advantage over other classes. The monolithic type, where tubes were used, gave a better construction than that made by wooden forms for slides, or a moulded cement top. All subways of this class give more or less trouble, caused by the grout running through the joints, thereby obstructing the ducts.

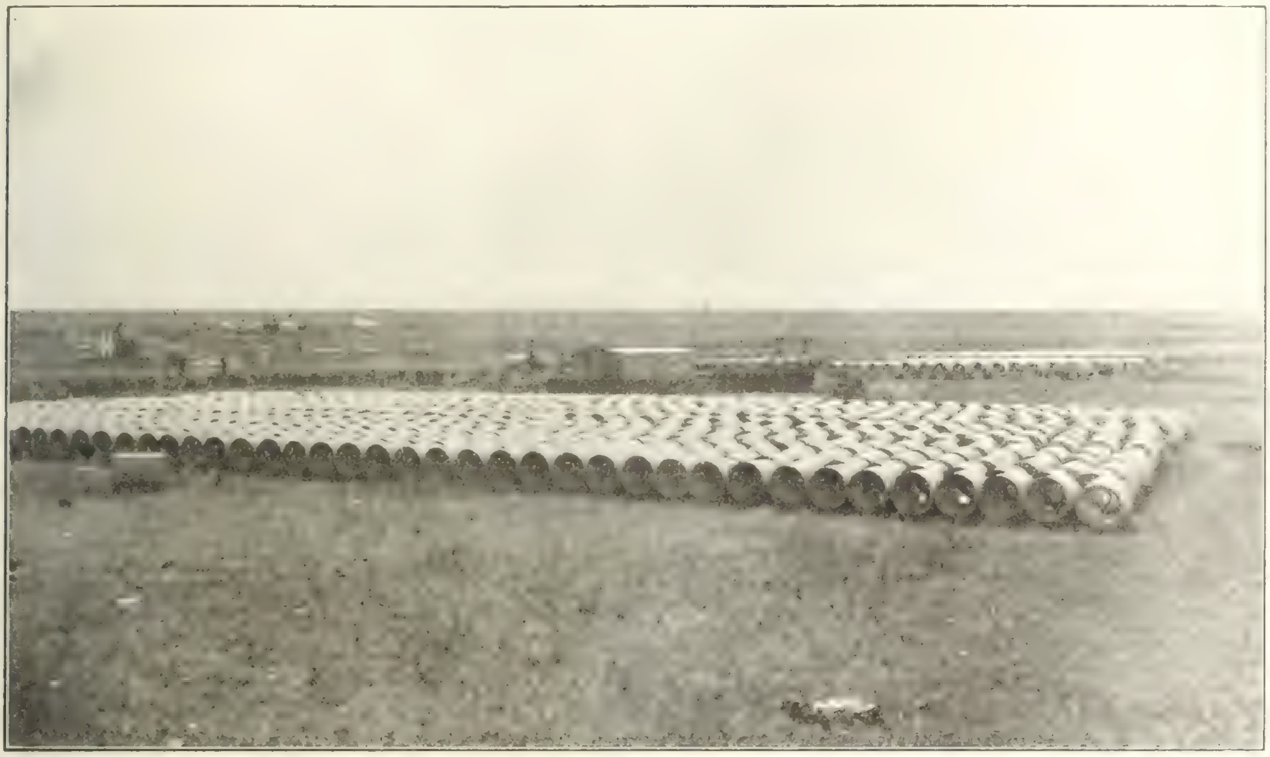
Pipe Used on Large Civic Work

The work on the low level intercepting sewer for the city of Toronto is progressing rapidly, and the reinforced concrete pipe is now being laid in several of the sections into which the great work has been divided. The accompanying illustrations show the pipe that is being laid throughout Section 5, which has a length of 3300 feet from the Don westward to Parliament street.

Views of Pipe in Process of Manufacture. Placing the Concrete in the Forms.

The pipe for this section was manufactured a short distance away from the work, local labor and material being employed, although the makers, the Lock Joint Pipe Company, have their headquarters in New York. They were awarded the contract for the construction of this pipe, and carried on operations in Sunlight Park. The work was commenced late in April and sections have since been made at the uniform rate of fifteen per day.

The Meriwether system of reinforcing, used exclusively in this pipe, provides for a continuous reinforcement. The pipe is laid in sections, and the joints between sections are so made as to insure freedom from leakage or obstacles to flow. By numerous tests under varying conditions the joints proved of even greater strength than the rest of the pipe. It is due to this greater strength, and to increased economy as well, that reinforced construction in pipes has almost entirely superseded all plain, monolithic construction.



A Field of 30-inch Pipe at Regina, Saskatchewan.

Manufacturing 60 inch Pipe for Low Level Intercepting Sewer, Toronto.

This system is one of the several that have succeeded in eliminating the serious objection to the use of concrete for sewer pipe. The fact that they are built outside the trench, giving facilities for proper inspection and manipulation and likewise for the proper placing of the reinforcing material has everything in its favor, these obstacles being overcome by building the sewer in short sections properly reinforced, and uniting them together after they are placed in the trench. The handling devices are so constructed as to throw the least possible strain upon the pipe while the concrete is in a comparatively green state. After it has been cast it is lifted from the moulds and conveyed to a place where it can be rolled into the trench.

The standard design of this pipe is a circular section with the reinforcing material placed concentric with the circumference of the pipe and toward the interior of the section. Very unusual conditions, such as an extraordinary heavy load, are met by a specially designed pipe with a flat base section. In a pipe of this design reinforcement is placed toward the interior of the crown and toward the exterior of the section of the spring line.

Various Practical Tests for Aggregates

Selection of Best Gravel and Sand—Testing for Silt and Voids and Grading of Grains—Alternate Method of Judging Sand

By Russell S. Greenman[*]

That almost all failures of concrete are caused by poor cement has been a popular opinion. After some failures the "post mortem" examinations have shown that poor workmanship, due to incompetent supervision, has sometimes been the responsible cause of the failures. Those experienced with concrete, however, found that, in addition to these two factors, the other constituent elements in concrete may be the causes for poor results or failures. These are truths which have almost become axiomatic.

The relation of intelligent workmanship to good concrete is solely a matter for consideration between the workman and the owner, it is not a question of general interest. If the owner of the proposed structure is content with poor work, that is simply his own business. The question of proper materials is, however, of general interest, for many structures are often constructed from the same group of concrete materials. The selection of those elements which with proper and intelligent workmanship shall produce good concrete is certainly important.

How to secure and select the best materials is often a problem. Apparently good sands or gravels have been selected, but not always have lasting results been secured. The method of securing for the consumer a good and safe cement has been provided for in many individual cases, but a campaign of education as to the need of careful selection of the aggregates and of construction in selecting them is still generally desirable. If it is true that the bulk of the cement now produced is used by the small consumer, then this applies especially to the smaller maker of concrete and not so much to those in charge of large public works. Even here, in many cases, surprising ignorance of the proper materials has been shown.

The selection of the materials for the concrete should be made only after careful examination and tests, either in the laboratory or on the site of the work or perhaps both. To aid this selection certain tests have been suggested and made. It will be found, however, that there are no standard tests or methods which can be used as a basis for comparable results. It is true that some of the laboratories of large public works and some departments of our state and national government make such tests, as for example the Structural Materials Testing Laboratory of the Department of the Interior, but almost all the tests made are individual in character and have not the endorsement such as the American Society of Civil Engineers has given to the method of testing cements.

We have before us, then, the question of tests and methods. These may be resolved into two classes, laboratory tests and practical field tests. The laboratory tests should be such that practical results and conclusions can be secured; the field tests should be made supplementary to the laboratory tests and confirmatory to them and not substitutes.

The selection of the coarse aggregates, crushed stone or gravel, is the more easily made, but sands and other fine aggregates do not so easily divide into good and poor materials. How such a division may be practically made is the topic we are to consider, and this paper is presented with the sole idea of starting a discussion as to the practical tests which should be made on materials proposed for use in concrete. When reference is made to sands it will include, of course, all materials for the fine aggregate, such as natural sands, screenings, iron ore tailings, etc. Gravels generally can be considered as sands, and facts concerning the one usually apply to the other.

Selection of Samples

It is, of course, generally conceded that any testing of the constituent materials is all wasted energy unless the samples submitted are thoroughly representative. It is certainly no easy proposition to take, for instance, a sample of sand directly from the sand bank or pit; but if the tests are to be of real value, provision must first be made for securing the best way, and from what place is it best to take the sample? Shall it be taken from the pit or after delivery upon the work? Sampling at the pit means that either the pit must be uniform or that extraordinary judgment must be used in selecting a sample typical of the sand, or gravel, generally in that pit. Undoubtedly the best sample from any pit is that taken from a blend made of samples taken at various places in the pit; but in some cases, even with the most conscientious sampling, the pit sample may not be thoroughly representative of the sand as it is delivered upon the work. Therefore, whenever possible, the sample should be drawn from the sand hopper or taken from the sand pile after delivery upon the work. This sample, if accepted, should be kept as the standard, and future samples, whether taken at the pit or after deliver, should be expected to equal in qualities the accepted standard.

Laboratory Tests

Having secured the sample, what are the most practical laboratory tests? The tests for strength of the mortar made with the sand and a "standard cement" is always a desirable test, but will not the tests for percentages of silt and of voids and for size and grading of the sand grains give results that form equally as good a basis for the acceptance or rejection of the sand?

In order to consider the tests more fully without entering into a detailed consideration of the methods used in determining each result, let us adopt, for the present, as our standard, the apparatus and the methods used by the Structural Materials Laboratory, to which reference has already been made. It is very probable that most of the larger laboratories follow the same general methods and will vary only in details. Now, having selected a definite plan of testing, do these results have a practical value in determining the relative merits of the different sands?

---

[*] Read before the American Society of Testing Materials.

To discuss this phase of our topic we shall use the results secured in the laboratory of the Department of the State Engineer and Surveyor of State of New York. From 34 sands selected practically at random, yet typical, from over 200 tested during the past two years, the interesting results in Tables 1, 2, 3, and 4 are noted:

Table 1.—Mortar Tests, Voids and Loam

No. of sands.	10	13	11
Class	A.	B.	C.
Tensile strength, natural:			
7-day	217	167	121
28-day	305	271	208
Tensile strength, washed:			
7-day	201	155	123
28-day	301	249	212
Voids, percentage	32.0	33.4	36.6
Loam, percentage	4.1	3.3	2.2

Table 2.—Granulometric Tests, Showing Percentages Passing Different Sieves

	Class of Sands		
Sieve.	A.	B.	C.
2	100	100	100
4	99	99	100
6	98	98	99
10	89	96	98
20	69	87	95
30	47	72	79
40	29	56	60
60	14	31	38
74	8	17	29
100	3.8	5.8	7.5
140	2.3	2.6	3.6
200	1.6	1.6	1.6

Table 3.—Effect of Voids

Percentage of voids	25-30	30-35	35-40
No. of sands	5	17	11
Average percentage	27.8	33	37.8
Tensile strength:*			
7 days	192	164	140
28 days	310	256	220
Percentage passing 100 sieve	2.8	6.4	6.7

*Results taken only of washed sample so that effect of loam would be nil.

Table 4.—Effect of Loam

Percentage of loam	0-2.0	2.5-3.5	5.0-6.0
No. of sands	7	6	5
Average percentage	1.0	3.0	5.6
Tensile strength, natural:			
7 days	128	181	222
28 days	254	273	324
Tensile strength, washed:			
7 days	148	178	205
28 days	261	271	310

*Sands selected which had approximately the same percentage of voids.

A study of these results will show that a sand can be judged by its percentage of voids or of loam and by size and grading of its sand grains. As a general rule it would be impracticable to make long-time tests for tensile strength, so these tables give only the 7 and 28-day tests. Longer tests are, of course, desirable, but as we are now only considering practical tests we will endeavor to draw some conclusions from the tests at hand. We find that in Table 1 the highest tensile strength is with the lowest percentage of voids and the highest percentage of loam; and that the natural samples containing more than 3 per cent. of loam are stronger than those with washed sand. From Table 2 we note that the smaller percentages of voids are secured by the sands having the best grading of the sand grains and that the sands with the largest percentages of fine grains are the poorer. Table 3 emphasizes the fact that sands are stronger when the percentage of voids is smaller, and that the less percentage of very fine grains the better the strength. Table 4 shows that loam to a certain amount is rather an aid to strength. This statement must not, however, be construed to mean that it would be advisable to permit large percentages of loam.

From this brief statement of the results secured and conclusions drawn can it not be seen that each test is a very important aid in determining the quality of the sand under inspection? There are, of course, other laboratory tests which are of great importance in the selection of a sand; among them is notably the careful examination of the character of the sand grains.

Foreknowledge of what qualifications are necessary and of what effect certain results may have is a vital point in interpreting the results; but with this foreknowledge we will then admit that results of tests like these do have a very practical value. With a better knowledge of the best methods of conducting tests and with a higher appreciation of the value of these tests among the general concrete contractors, and frequently among engineers themselves, then laboratory tests can be utilized to their full value. Scoffers at laboratory tests have only to examine results of the tests with concrete in which the sand has been used to see that the tests do forecast what does take place in the concrete.

Field Tests

While it may be most practical and best to have the sands first tested in the laboratory, the greatest ultimate good to concrete in general would be to convince the contractor, and often the engineer, that simple field tests will also be of material benefit to the work. For example, frequent tests for density and for proportioning would have a most beneficial result. The contractor would not necessarily have to use more cement, but on the other hand he might be able by proportioning to produce a more dense concrete simply by the addition of more either fine or coarse aggregates.

Such simple tests as that for percentage of loam by use of a graduated cylinder or that for the percentage of voids by means of the percolator should be frequently made. Neither of these, for example, requires elaborate apparatus and can be made in any field office, and yet how seldom in general work is any effort made to learn how much loam or how many voids a sand contains.

A report from London, England, states that dock laborers to the number of 60,000 are on strike. The seamen's strike, which was settled some time ago, convinced the dockers that they could also obtain their demands by similar action and as a result strikes have occurred in various shipping ports in England and Wales. London hitherto has not been seriously affected.

Hamilton's building statistics for the month of July show an increase of $17,000 over the co.responding month last year.

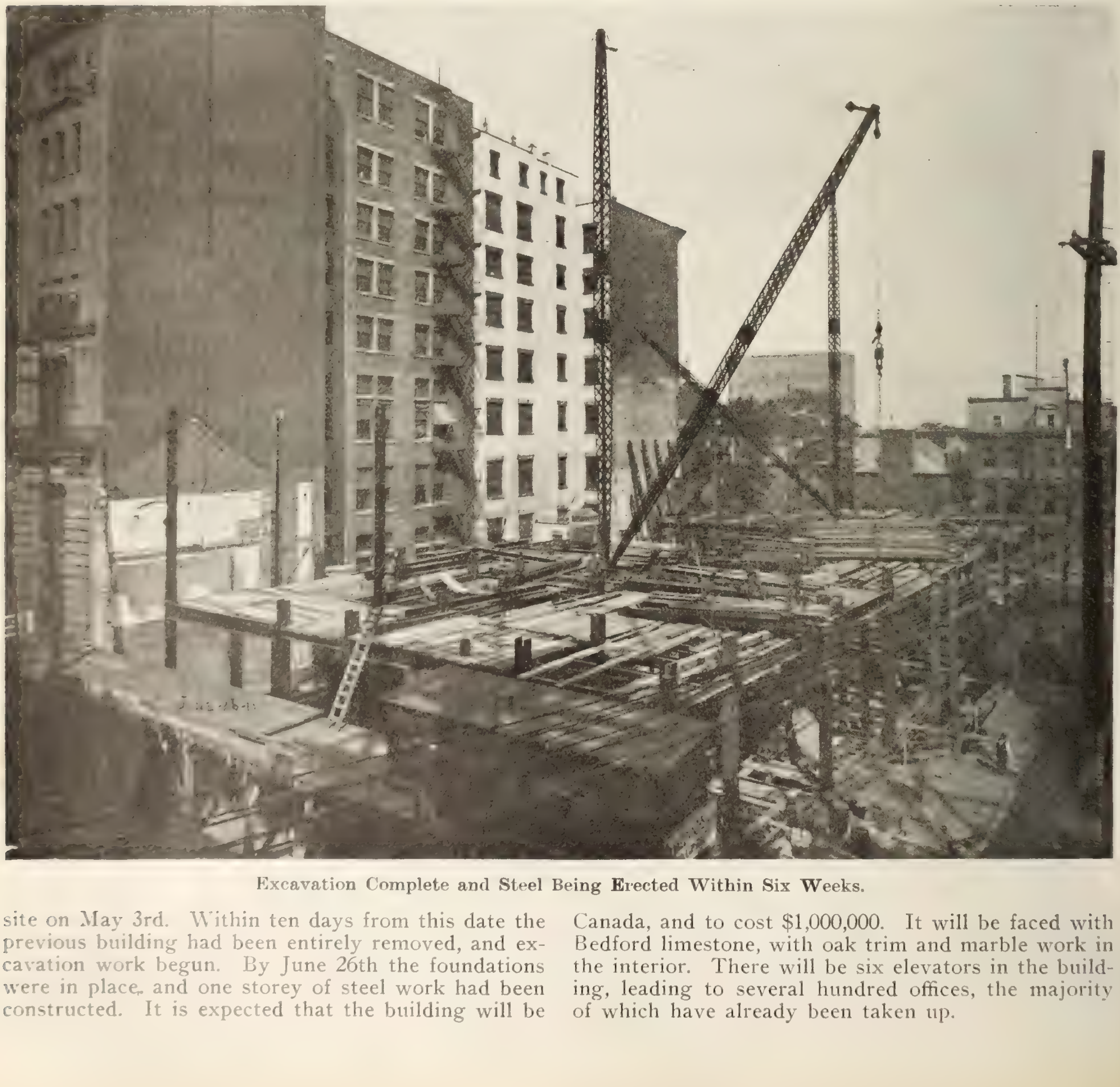
Quick Construction

Remarkable progress has been made in the construction of a new Transportation building, in Montreal, as is evidenced by an inspection of the accompanying photographs. The work was started on the site on May 3rd. Within ten days from this date the previous building had been entirely removed, and excavation work begun. By June 26th the foundations were in place, and one storey of steel work had been constructed. It is expected that the building will be ready for occupation by February, which will be some three months before the required time of completion P. Lyall & Sons, Limited, are the contractors.

The Transportation building is a steel and concrete structure, designed to be the finest office building in Canada, and to cost $1,000,000. It will be faced with Bedford limestone, with oak trim and marble work in the interior. There will be six elevators in the building, leading to several hundred offices, the majority of which have already been taken up.

Buildings on Site May 3rd.

Site Ten Days after Contractors Got Possession.



Excavation Complete and Steel Being Erected Within Six Weeks.

Victoria's Legislative Buildings

Detail plans have now been completed for the extension of the legislative buildings of Victoria and tenders have been invited for the erection of the side wings. Two complete blocks are to be devoted to office and departmental purposes, these being three storeys in height, absolutely fireproof, of granite similar to that employed in the existing structures on Parliament Square, and in architectural harmony therewith.

The new wings will contain 32,500 square feet of floor space exclusive of corridors, lavoratories, stairways, etc., divided into intercommunicating rooms 20 by 26 feet each and ninety-six in number. The new library block tenders for which are now being invited, will be the central architectural feature of the addition, the total cost of which will run from $600,000 to $750,000.

Temperatures in Masonry Dams in Great Britain are stated by Mr. Edward Sandeman, engineer of the Derwent Valley Water Board, to vary about 5° at a distance of 30 ft. in from the face, while at a depth of only an inch or so, a variation of 70° may be found.

The Transportation Building, Montreal, when completed.

Port Arthur to Sudbury Line

Work is being started on the construction of the Port Arthur to Sudbury division of the Canadian Northern Railway. This line will be over 550 miles in length.

The route of the line is a wide curve, penetrating the plateau of the height of land about hundred miles at its farthest from the shore of Lake Superior and descending again close to the water at Nipigon, whence the Canadian Pacific Railway's line is more or less closely paralleled into Port Arthur. The greatest part of the work to be done is through clay belt formations, and is described by Mr. Henry K. Wicksteed, chief survey engineer, a very ordinary railway construction. The most interesting section is in the last 120 miles into Port Arthur, which includes some heavy side hill work in rock and an 1,100-foot tunnel along the shore of Lake Nipigon. The Nipigon River is to be diverted and a costly bridge is to cross it, and the Blende Valley will be crossed by a viaduct of 2,200 feet.

The location is said to afford the easiest gradients of any of the three transcontinental lines. Against west-bound trains the maximum grade is to be six feet in one thousand, and five feet against eastbound trains, but this will be reached in very few instances, much of the line being perfectly flat. The heaviest curvature with few exceptions, is six degrees; and four degrees is the rule for some hundreds of miles on the interior plateau.

The work will be done conjointly by the Foley Brothers, of St. Paul, and the Northern Construction Company, of Winnipeg, who will start operations at once, putting between four and five thousand men in the field.

The Cost of Making Brick

The figuring of cost in brick yards has not been practiced much, and while the figures which are obtainable vary greatly, it has been found that the best results are obtained over a long period of operations. The following table will give an idea of the operations of a large brick yard, well equipped, which made six million brick per year. In 1894 they had a strike and in 1909 the year was very bad for production on account of the weather condition. The power used was a steam engine of 80 h.p.:—

Production in Year	Millions	Labor	Kiln Coal	Engine Coal	Repairs	Expense	Supplies	Total
1901	3,250	6.86	2.90	2.15	2.02	0.75	0.48	15.16
1902	2,225	7.06	3.30	1.62	1.88	1.39	0.15	15.40
1903	2,500	7.00	3.24	2.28	2.48	0.88	0.14	16.02
1904	3,000	7.04	2.87	1.40	3.47	1.28	0.20	16.26
1905	3,500	6.91	2.92	1.28	5.00	0.68	0.20	16.79
1906	4,150	7.00	2.95	1.40	0.89	0.70	0.18	13.12
1907	3,634	8.00	4.40	1.19	1.25	0.73	0.17	15.47
1908	4,300	7.30	3.12	1.50	0.60	0.78	0.10	13.40
1909	2,674	10.35	2.73	1.60	1.60	1.20	0.17	17.65
1910	3,809	8.15	2.49	1.44	1.57	0.75	0.21	14.61
Av.	...3,304	7.57	3.09	1.59	2.07	0.91	0.20	15.42

These figures are all based on the thousand brick, and the values represent marks (1 mark, 24.8 cents). Most bricklayers make the mistake that they do not count the depreciation of the plant, and also do not bear in mind the interest. It can be safely stated that a brick yard is run down in twenty-five years, and a depreciation of four per cent. is, therefore, not too much—Deut. Topf. & Z. Z. No. 31, 1911.

Comparisons with previous annual returns of the earnings of the C. P. R. give cheerful testimony to the progress that the road is making. Since 1908, three years ago, the gross earnings of the road have increased by nearly thirty three millions, or 31.4 per cent. In the same period the net increased $14,907,463, or 46 per cent.

The following figures are for the month of June and twelve months ending June 30:—

	1911	1910	1909
June gross .. ..$	9,479,650	$ 8,807,817	$ 6,550,153
Expenses	6,454,979	6,089,901	4,661,727
June net	3,024,671	2,717,916	1,888,426
Twelve months, gross	104,167,802	94,989,489	76,313,316
Expenses	67,467,975	61,149,533	53,357,745
Twelve months, net	[illegible]	[illegible]	[illegible]

Reinforced Concrete Floor Slab Design

Report on Investigation of Theories for Flat-Slab Designing Application of Grashoff's Formula to Various Methods

By G. C. Stone, C.E.*

That the flat slab or girderless type of floor construction in reinforced concrete, (commonly called the "mushroom system"), is to become the usual type in that class of building construction which involves intermediate columns, is now beyond doubt. The advantage of this mode of construction over the common "slab-beam-and-girder" are multiple. The design, construction and erection of the forms is with the flat slab reduced to a minimum of simplicity, thus saving both time and timber. The thickness of flooring, from floor-level to under surface of ceiling below is reduced to about a quarter of what it would be were girders used, thus reducing height of structure; and the slab itself used be no thicker than would be required with long slabs resting on deep beams. With buildings of the same height, more of the cubic feet of space covered by the roof are actually available when the flat slab is used. Lighting, heating, and ventilating are much simpler problems with the flat slab; and when once the nature of the internal stresses set up in a flat slab or reinforced concrete, supported on columns and subject to various and varying loads, is known, the design of the slab itself will become a very simple matter.

The idea of making this investigation was derived from a perusal of various theories, (some of them conflicting and contradictory), which have been advanced and put into practice for the design of flat slab floors. While thoroughly convinced of the advantage of the flat slab system, the writer was not a little puzzled by the wide range in the limits of fundamental assumptions as assumed by various authorities, by the conflict of opinions of those who have made a study of the subject of flat slab design, and by vast difference in results arrived at by these several designers. Of the methods examined, the variation in cost approaches 300 per cent. And these designs were made by engineers of recognition in the profession.

In the design of a flat-slab floor, we have to deal with a complex combination of elastic stresses. Evidently, the originally plane surface of the slab, when loaded uniformly over several panels or sets of four columns, tends to become a warped surface; that is, there is a tendency for the slab to sag downward around each column somewhat umbrella-fashion, thus compressing the slab at the bottom and stretching it at the top on lines radiating from the column; at the same time the slab is compressed at right angles to these lines by reason of the doming action about the column. Likewise, the part of the slab in the centre of the panel is dished or made concave upward, the tension being at the bottom and compression at the top, (compare above), in this case, but with a similar circumferential compression (about centre of panel now) due to the dishing. Evidently, too, since the slab tends to sag on a direct line between the columns in a row as well as within a panel, this dishing in the centre cannot be uniform around but must be most marked on lines between diagonally opposite columns. Also, it is evident that we must have decidedly different elastic deformations about the column and within the panel; for the "umbrella" over the column is similar to that produced in a flat footing supporting a concentrated load at the centre; while the dishing is similar to that produced in a plate supported around its periphery and uniformly loaded. As to the shape of this representative plate, we are in doubt; nor are we quite assured that its peripheral support should have a plane surface; for does not the slab sag between columns in a row? Again, when the distribution of the loading is changed, may not these tensile and compressive stresses be modified, or even reversed? And if we are to consider the stiffening effect of the column-head in reducing the bending moment over the support as has been suggested, do we not necessarily then have to design the columns to resist flexure—eccentric loads—thus increasing the cost of the columns?

At first sight it would seem that the old Cantilever Method is the reasonable method of design. By this, a unit width of the slab is designed as a beam, both cross and diagonally; but to do this properly we must know fairly accurately the location of the line of inflection about the column-head, and the resulting size, shape, and deformation of the suspended plate. And since we must be able to adapt our design to resist reversed stresses due to "continuous girder" action and excessively concentrated loads, (which we cannot do by the cantilever method), evidently this design would be undesirable.

Tu neaure and Maurer, in Principles of Reinforced Concrete Construction, base their method and construct their diagrams on a modification of the cantilever method. Though their design does not give the same result as the cantilever, it is open to the same objections as given above, but somewhat modified by the use of heavier slabs and more steel. The result is expensive.

It has been attempted to justify the application of Grashof's formulas to slabs of reinforced concrete. Grashof's formulas were derived for plates of steel—a homogeneous material—supported on four points. As to just how a slab of a composite material like reinforced concrete can be assumed to behave under uncertain stresses like a slab of steel, and permit the application of Poisson's ratio, seems never to have been quite clearly understood.

Mensch, in his Pocket Book, has assumed a maximum possible bending moment of $M = wL^2/20$, which is intended to be a little toward the safe side as compared with its original form of $wL^2/26.5$ given by Grashof. In other words, the unknown difference between the behavior of reinforced concrete and steel presumably is assumed as being equivalent to the difference between these values.

In his book, Concrete Steel Construction, C. A. P. Turner gives his formulas: $M = wL^2/50$ for moment, and $\Delta = WL^3/7,000$ for deflection, and prescribes the width of column head, and of bands of steel, to be from 7/16 L to 1/2L. Both of these formulas he derives from actual tests on single panels already erected. The method is ingenious and the equation daring; and, necessarily, the result is a very low cost. We fear it is too low.

---

*Cornell Association of Civil Engineers

MacMillan takes Grashof's analysis of stresses in a plate supported in various ways, and, by proportion, deduces a formula for bending moment of $M = wL^2/25$; this he uses in his design to get the maximum stress over the column-head, assuming that the moment at the centre of the slab will be one-half as much. This latter assumption, of course, is only partially true. He finds the bending moment, provides the necessary steel, and then makes the slab of such a thickness as will properly embed the bars—this thickness usually being greater than is actually required by the compressive strength of the concrete. MacMillan arranges his steel in much the same way as Turner, making the width of the bands equal to 7/16L; and he, too, backs up his theory by citing numerous cases where it has been used successfully. He recommends from 16 to 24 feet as being ordinarily the most economical span, preferably square.

Brayton assumes $wL^2/24$ for the bending moment at the centre of the panel, and doubles this over the columns. He makes his bands 7/16L wide and uses the same method of distribution of the bars as Turner and MacMillan, letting the bars lap over the column-heads and so provide for the doubled bending moment of the slab.

Now taking up and discussing each of these methods in turn:

As we have already pointed out, the Cantilever Method presupposes a definite fixed load and loading, and the floor is accordingly designed to carry this. Since the load may vary almost indefinitely in amount and distribution, we would have to provide for any of these possible conditions, and such a provision, treating the slab as a cantilever, is impractical if not impracticable. So we are inclined to pass this method by as one that is very interesting but quite useless.

Turneaure and Maurer, it would seem, undertake to provide for the uncertainties and shortcomings of the cantilever method by using an abnormally large factor of safety. While this undoubtedly answers the purpose so far as enabling the slab to carry the load is concerned, yet the construction is bulky and expensive. However, assuming as they do that the slab action is similar to that of a cantilever system, modified and complicated, we believe that they are approaching the correct basis of flat-slab design.

We have already stated our conclusion regarding the application of Grashof's equations, unmodified, to slabs of reinforced concrete. We should remember, too, that these equations were obtained by testing square plates, only. We see no reason for attempting to assume that, what has been found by test to take place in a plate of a composite substance like steel, will likewise occur in a continuous slab built up of two materials as unlike in every respect (except temperature effect), as concrete and steel. If slabs based on these formulas have given satisfaction, it should be considered not so much a proof of the applicability of the theory as a fortunate coincidence of circumstances. We do not know on just what grounds Mr. Mensch justifies his modification and subsequent application of Grashof's formula.

Mr. Turner tested single panels only, thus making the slab deflect somewhat as a plate fixed at four sides would deflect. There was no continuous action. Now, the question is, would Turner's formulas be upheld by a test over a number of adjacent slabs or panels? That is, would a flat-slab designed for $M = wL^2/50$, when loaded over several panels, bear out the formula $\Delta = WL^3/7,000$? Mr. Turner has the advantage of buildings designed by his method which are now in use and giving satisfaction. Also, his design is the cheapest yet proposed through the engineering press; no one else has dared to use a factor of 1/50 for M. Evidently, then, so long as these two points are in his favor no one can dispute the fact that his methods are successful. As to whether their success is due to good theory, good guessing, or good luck, seems to be undetermined.

MacMillan's reasoning is good, as far as it goes. To quote from his paper read before the Sixth Annual Convention of the National Association of Cement Users, at Chicago, February, 1910:

"For a square plate supported on two edges, $f = 3\,wL^2/4t^2$.

For a square plate fixed on two edges, $f = wL^2/2t^2$.

For a square plate fixed on four edges, $f = wL^2/4t^2$.

For a square plate fixed on foud points, $f = wL^2/4.27\,t^2$."

(from Grashof)

Here, f=max. fibre stress; w=total load, lb. /'; L= length in ft.; B=breadth in ft.; t=total thickness in ft.

"It is interesting to note that a plate fixed at four points is stronger than one fixed on four sides, and is 3.2 times as strong as one supported on two edges. Now, in the first formula, the moment of resistance can be expressed by $M_r = wBL^2/8$. Therefore, for a plate fixed at four points and the same unit load, the bending moment will be 1/3.2 times this amount, or $M = wBL^2/25.6$. Using 25, instead of 25.6, for a denominator the result will be $M = wBL^2/25$—a formula that expresses the maximum stress over the head of the column." We quote this in full, not so much for the final result as for the method employed in obtaining it. Aside from the fact that the initial equations are more or less connected with homogeneous materials, and the fact that in the original tests only one plate was loaded, so that those equations should be applied with caution to reinforced concrete construction, it would seem that some such course of deduction as this is the proper one to pursue in treating the subject of flat-slab design. But on one point we must decidedly disagree with Mr. MacMillan. He says: "When panel is rectangular, L is greater than B and must be used in getting the bending moment." We cannot see this. If two beams of the same material, and same cross-section, and bearing the same load per unit length, are themselves of different lengths, evidently the longer of the two will deflect the more. If we fasten the two beams together crosswise and again apply the same load to each as before, they will sink to a position intermediate between their several deflected positions when loaded the first time, because the shorter beam helps to hold up the longer. Then the shorter beam must carry its own load and also some of that on the other beam; so we should certainly design with regard to the short beam, or the short dimension of the floor slab.

In a paper of this sort we cannot go into the details of a typical slab by each of the methods enumerated. But we have taken the table given below from Mr. MacMillan's paper, in which he himself works out an example by each of the methods hereinbefore discussed except, of course, Brayton's; for Brayton set forth his method in a discussion of MacMillan's paper.

and differs from MacMillan only in that he assumes 1/12 for its maximum moment coefficient. To MacMillan's table we have added Brayton's results, and also our own for a "slab beam and-girder" panel, with a column for costs assuming, for purposes of comparison, that the steel costs 4c. in place and not reckoning the cost of concrete. The panel taken in each case was 20 feet square; live load, 200 lbs.

Authority	Slab thickness	Steel stress: lbs/"	Lbs. of steel used	Cost of steel:
Cantilever Type	8"	16,000	2,189	$87.56
Turneaure & Maurer	12"	16,000	1,931	77.24
Grashof	8"	16,000	784	31.36
Mensch	8"	16,000	2,120	84.80
C. A. P. Turner	8"	*16,000	549	21.96
MacMillan	8"	16,000	1,084	43.36
Brayton	8.5"	16,000	1,900	76.00
Average:	8.64"	16,000	1,508	60.33
Slab beam and girder	12"	16,000	2,300	92.00

*Turner recommends 13,000 lbs./".

We note that the cost where the beams and girders are used is the highest; and for the flat-slab the cost ranges for a 20 ft. square panel from $21.96 to $87.56, with an average of $60.33! Truly, a wide variation. As a matter of fact, we should not compare the Grashof result with the others which are continuous.

As to the conclusions to be derived, we should say that MacMillan's is nearest the mean of the results shown. Personally, too, we should be inclined to think that the value which he uses for moment coefficient is most nearly what the future will show to be correct. But it would seem that no method of design should be used without a liberal allowance for un-known influences of the "umbrella" and "dish" action in stressing the material until the nature and amount of such influence have been demonstrated by actual experiment.

The recent test of a flat-slab floor in Minneapolis, a description of which has been furnished the press by Mr. A. B. Lord, of the University of Illinois, seems to have been a thorough and well conducted test. The comparison of the results of this test with the design by which the building was erected has not yet been given out. But we note the sense, if not the exact words, in the following general conclusions by Mr. Lord:

"Analysis by the beam method errs on the side of safety, and probably represents the maximum possible stress; which, however, is actually reduced by slab-action.

Grashof's analyses were made for a homogeneous material and depend on Poisson's ratio; also, they apply to square panels only, and not to these unless the conditions are such that the maximum stress falls within the panel and not at the column. Grashof's analysis unchanged cannot be applied here safely or reasonably. The moment in the slab is shown by analysis and by test to be greatest at the support, and the critical section is found by test to be near the edge of the capital; so the size of the capital should depend on the size of the panel, not of the column. The side of the capital should be about 0.2 the side of the panel, if square—proportionate to the panel area, otherwise. At the support the part of the reinforcement band over the column must carry all the shear; but the entire width of the band may be considered to resist bending moment if not more than twice as wide as the capital.

The maximum moment should be computed about the edge of the capital, and should be taken as double the moment at the centre of the panel; Turner's coefficient of 1/50 should be used cautiously. No dependence should be placed in tests of single panels."

It is to be hoped that the Minneapolis test will furnish some definite results by which scientifically accurate designs may be made of this admirable type of reinforced concrete floor-construction. No doubt such results will be forthcoming.

Canadian Contractors and Their Work

Messrs. P. Lyall & Sons, Limited

It is no small matter to be regarded as the largest concern in one's special line of business in a country like Canada. This is the proud position held by Messrs P. Lyall & Sons, Limited, the well-known building contractors, in Montreal. It was in the early eighties that Mr. Peter Lyall, who came, as a young man, from Scotland, established himself in business as a contracting mason in the future commercial metropolis of the Dominion. He brought with him from the Old Land, and put into his new-world business, those qualities of thoroughness, ambition, and determination that have so generally characterized his fellow countrymen.

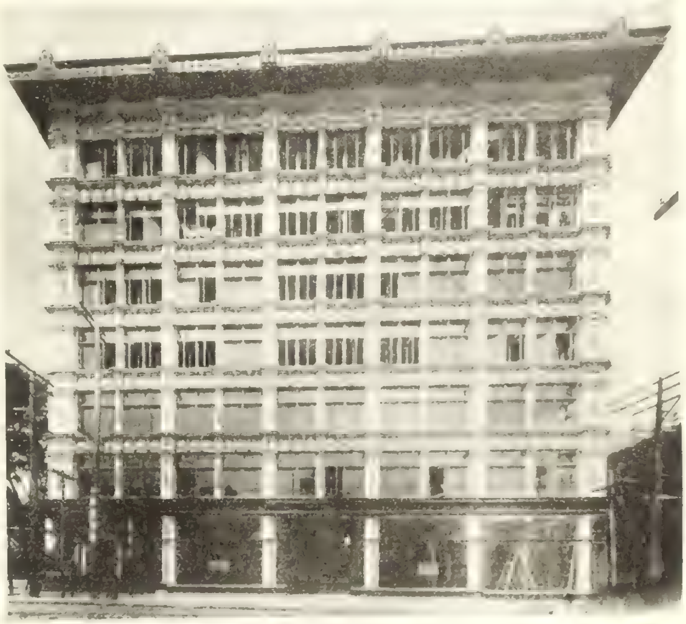
Mr. Peter Lyall, President of P. Lyall and Sons, Montreal

Two of Mr. Lyall's sons are associated with him in the extensive business in which the firm is engaged. Mr. William Lyall has been associated with his father from an early age. He has practically grown up with the business, and developed accordingly. In the position of managing director he has shown himself to be a capable administrator, while his foresight and capacity for detail have been largely responsible for the rapid expansion of business as well as the stability and popularity of the firm. Mr. T. O. Lyall, in the direction of the office work and care of the financial side of the enterprise, is equally alive to the responsibilities of the hour and the opportunities of the future. He also has been with the firm several years. They make a good team, the progress of the firm being the best evidence of the fact.

Mr. Peter Lyall, president and founder of the firm, is connected with a large number of commercial, financial and charitable enterprises, and is, among other things, president of the Western General Hospital. In recent years he has been able to loosen his hold somewhat on the building business, and give more attention to questions affecting the best interests of good citizenship, where he is always on the right side, and his influence is highly regarded and appreciated.

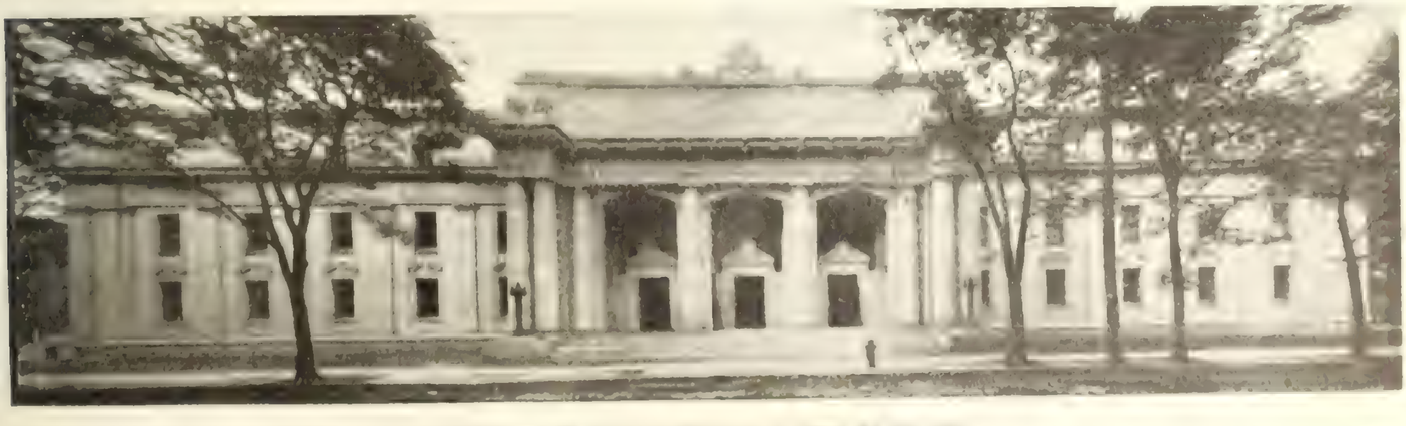
Mr. William Lyall, Managing Director of the firm

Every department of building operations, with the exception of ornamental iron, sheet metal, structural steel and roofing, is handled by this firm in their own shops, and by their own employees. Their stone-cutting plant occupies a building 300 by 150 feet, and their marble shop is 50 by 250 feet. The planing mill is a two-storey structure, 150 by 150 feet. They have three large tool yards that scarcely provide space enough to accommodate their rapidly increasing equipment. All these shops are provided with the very latest mechanical devices for the artistic and expeditious production of the materials required in their varied building operations. Their operating plant is estimated to be worth $600,000. The building operations of this firm have always been carried on under the open shop principle, and believing this to be the best in the interests of the men themselves, as well as proprietors and contractors, it is the intention to continue this system. Men are paid what they are worth, and not infrequently more than the union scale; but the firm hold themselves free to discharge any man at any time who cannot earn the wages he wants or is getting. Employees are engaged irrespective of race or religion, unionism or other affiliations, the only requirement being honesty, steady habits, and ability to do the work allotted to them.



The Kellert Building, Montreal, a Lyall contract

Among the buildings at present in course of construction by this company are: The Transportation building, and the Dominion Express building, Montreal; the Central Union Station building at Ottawa; the Arena building, Toronto; the Grey Nuns' Hospital, Regina; the "Times" office buildinp, Moose Jaw; the "Times" printing office, Moose Jaw;



Montreal Technical School, to cost $1,000,000 a palatial residence for Lieutenant-Colonel C. A. Smart, Montreal; a conservatory for Lord Strathcona, Montreal; three buildings for James Strachan, baker; a power house and chocolate factory for Walter Baker & Company of Canada, Limited, development work consists of water mains and sewers, street and sidewalk construction about a mile in extent for the Montreal City Land Company at Longue Pointe.

In the course of their long and busy career this firm has erected many of the largest and most expensive buildings, both public and private, in Montreal, and we might say in Canada. This is the case to such an extent in their home city that the growth of Montreal and the progress of the company seem to have proceeded along parallel lines, and the city owes much of its appearance of beauty and stability to the firm of P. Lyall & Sons, Limited. It is interesting to enumerate a few of the principal structures which have been erected by this firm and which attract universal attention from visitors to this city. First might be mentioned the Board of Trade building, erected at a cost of $400,000; then the G. T. R. general offices, costing $800,000; the Royal Victoria Hospital, costing $1,000,000; Canada Life Assurance offices, $675,000; the New York Life Insurance Company's office, $600,000; the Montreal Stock Exchange; the Sun Life Assurance Company's head offices; the Coristine building; the Imperial building; the Macdonald Engineering building of McGill University, $150,000; the Royal Victoria College for ladies, $250,000; Proctor's theatre; the Yorkshire building; the McGill Museum and old Medical building; the Montreal Light, Heat & Power Company's Wellington Street sub-station; the Merchants's Cotton Company's factory; the Belding Paul & Company's factory; the residences of Mr. E. S. Clouston, Mr. James R. Wilson, Mr. George L. Cains, Mr. Lansing Lewis, Mr. James Robinson, Mr. James Crathern and others. Among other outside contracts of importance may be mentioned the Montreal Cotton Company's extensive works at Valleyfield costing over $500,000; the Royal Alexandra Hotel, Winnipeg; the C. P. R. Railway Station and offices at Winnipeg.

Saskatchewan Parliament Buildings, Regina, P. Lyall & Sons, Limited, Contractors

The Montreal Technical School, not previously mentioned is a million dollar structure. It also is of steel and concrete and white pressed brick facing.

A still larger contract was the Regina Parliament buildings costing a million and a half. This is a reinforced concrete and steel structure, having a frontage of some 600 feet. In the million dollar class must be mentioned the Union Railway station at Ottawa of similar construction to those just mentioned but possibly with finer finish in some details. There are four departments in this building—one containing the head offices of the Railway Commission, another the ticket office and lunch room, another divisional offices of the G. T. R.; the waiting room is a beautiful apartment whose ceiling is 70 feet high and finished in ornamental plaster and "Traventine" marble. The concourse or main hallway is also beautifully designed.

The Kellert building is a beautiful steel and concrete structure, faced with ornamental terra cotta and costing $250,000. The Eastern Townships Bank's head offices on Victoria Square cost $150,000 and is a good example of the solid, substantial construction which characterizes Lyall contracts. The National Bridge Company's works is another structure put up on June 13, 1910. It is of steel and concrete and brick. The plans for the work were prepared while construction was under way. The cost of the suite of buildings was $300,000.

Montreal Notes

The Montreal City Controllers have appointed Mr. Emile Pepin, architect, as an assistant building inspector on Mr. Chausse's staff. The salary is a thousand dollars a year. He will be responsible for the inspection of a section covering about one-third of the city.

The strike among the carpenters has not been settled at the time of writing. Several employers have agreed to give the minimum wage of 35 cents an hour for a nine hour day and a large number of men have returned to work. The Harbor Commissioners and Messrs. P. Lyall & Sons, Limited, were among those who refused to recognize the Union or its scale and some of their men remained out.

An ambitious scheme is being entertained by the civic authorities of Montreal for the erection of a ten million dollar city hall—sometime. The proposed location is in the district bounded by St. Lawrence, Rachel and St. Denis streets and Mount Royal avenue. The property would have to be expropriated, being now covered with residences and a few stores. It is thought it will take from twelve to twenty years to carry out the project and by that time this locality will be in the centre of the city.

Trade Notes and Items of Interest

The St. Lawrence Pulp and Paper Mills at Ottawa were damaged by fire to the extent of $30,000.

The Provincial Government will rebuild at once the Hamilton Asylum destroyed last week by fire.

The ratepayers of Guelph have decided to continue construction work on the Huskisson Street sub-way.

The Canadian Pacific Railway Company are building a new dock at Port Arthur, Ont., at a cost of $230,000.

The City of Moose Jaw proposes installing approximately 17,000 linear feet of sewer and water main extensions.

The C. P. R. are contemplating the construction of a new spur line from Three Forks to Bear Lake, in British Columbia.

Winnipeg reports a total of $11,500,000 worth of building permits that have been issued during the first seven months of the year.

The Canadian Northern Railway announces that it will require 20,000 men to construct the Port Arthur to Sudbury branch of the line.

The City of London reports an issue of building permits for July to the value of $93,726, making a total of $552,149 for the year 1911 to date.

The plants of the Union Construction Company, Ottawa, and of the Ottawa Stone and Brick Company, were recently damaged by fire to the extent of $10,000.

Calgary's municipally-owned street railway earned during July about $40,000. This makes the month just ended the best in the history of the municipal railway.

An estimate of Canada's fire losses during July amounted to $5,384,300, compared with $1,151,150 for June, and $6,386,674 for the corresponding period last year.

The ratepayers of Nanaimo, B. C., have granted a franchise to Messrs. Haffner & Smith, Montreal, to provide hydraulic power for all purposes within city limits.

The value of building permits issued by City Architect McCallum during July amounts to $2,789,520. Toronto is experiencing nothing short of amazing activities in this branch.

The building permits issued in the City of Guelph during the month of July amounted to $26,025, making a total for the first 7 months of the year of approximately $380,000.

Calgary building permits show an increase of 57.2 per cent. over the building returns of July, 1910. During the past month 214 permits were issued, representing a value of $817,980.

Additions will be made to the Parliament Buildings, Victoria, to the extent of some $75,000. Two wings will be built to the present structure, to be of fireproof construction, and granite facing.

Negotiations as to the appropriation of property for approaches to a new steel bridge at St. Andrews Locks, about fifteen miles from Winnipeg, have been started, and surveying will begin at once.

The Department of Railways and Canals, Ottawa, is at present considering the tenders that have been received for the job of constructing the section of the Hudson Bay Railroad from Pas Mission to Thicket Portage, a distance of 185 miles.

The firm of J. S. Metcalfe & Company, Montreal, have been awarded the contract for the Grand Trunk station improvement at Ottawa. This is to consist of a cement platform and canopy over track terminals, and will cost in the neighborhood of $100,000.

After considerable delay, caused by the city council debating upon the question of beginning to widen Yonge street, at the congested business corner, the C. P. R. were granted a permit to erect a 15-storey office building to cost $900,000, at the southeast corner of King and Yonge streets, Toronto.

The Union Trust Company are erecting a splendid 12-storey structure in Winnipeg. Tenders will be called for shortly and the buildings are at present to be demolished, in the preparation for excavating. The new building will be of steel structure, and absolutely fireproof. Mr. J. D. Atcheson is the architect.

Building reports from Montreal, for the past month show an issue of 329 permits, to the value of $1,057,761. During July, 1910, over three times this amount was recorded. The carpenters' strike, which is now of some weeks' duration is probably accountable for much of the decrease.

Various railway contractors in British Columbia state that the scarcity of labor is becoming exceedingly grave, and that scores of the camps are experiencing difficulty in carrying on their work owing to this cause. It is understood that the Vancouver Board of Trade will be requested to ask the Dominion Government to modify the immigration regulations, in order to make up the deficiency.

The Brandon Construction Company has been awarded the contract for the erection of the new power house in connection with the Brandon Asylum for the insane. This structure will be brick and concrete on a concrete foundation, which must be completed by Feb. 15, 1912, will be 60 by 115 feet and about 30 feet in height, one end being of two storeys to provide accommodation for the caretaker. The work includes a solid masonry chimney 150 feet in height.

Personal Notes

Mr. Peter Van Westrum, a member of the Westrumite Paving Company, and a native of Brantford, Ont., died suddenly in Victoria, B. C.

Mr. J. R. Frames, consulting engineer to the Dominion Government, is in Vancouver to inspect the work at the Coquitlam Lake where it is proposed to erect an 85 foot dam.

Mr. E. S. Estlin, Chief Engineer of the Manitoba Elevator Commission, has resigned his position to become supervisor of construction, for the Saskatchewan Elevator Company.

Mr. George Hutchinson, Ex-Provincial Architect for Saskatchewan, and a member of the firm of Messrs. Fraser & Hutchinson, of Regina, is re-engaged in his profession in Victoria.

The death is reported of Mr. H. E. Lawson, Mining Engineer, late of Toronto, in West Africa. Mr. Lawson graduated from Cambourne College, Cornwall, as a silver medalist, and practised his profession in India, Borneo, New Zealand, and West Africa, as well as in Canada.

Mr. Joseph Perrault, Architect, "Fairmount Court," 2106 Park Avenue, is completing the plans and specifications of the proposed enlargement of the Campbell Manufacturing Company, on Elmire, Cadieux and Colonial streets. The excavations were begun last week by Messrs. Shearer, Brown and Wills, general contractors.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is nvited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Calgary, Alta.

It is recommended that the contract of the Crown Paving Company for laying 25,000 yards of asphalt be accepted.

Cannington, Ont.

Tenders called for drainage, $3,000. Owner, Village of Cannington; Clerk, W. A. Robinson; Engineer in Charge, Cavana & Watson, Orillia, Ont. 1-3 excavation trenches for 15 in. 12 in. 8 in. sewer pipes; (4) to make and put in brick and cement silt basins, 2 ft. 6 in. inside dia. and about 6 ft. in depth; (5) to supply cement or salt glazed vitrified tile. Plans, etc., at office of clerk. Tenders received by clerk until Aug.

Cornwall, Ont.

By-laws carried for waterworks. Owner, Corporation of Cornwall. Town Clerk, Geo. S. Jarvis, Cornwall. By-law to raise $30,000 for water mains carried.

Fort Erie, Ont.

Contemplted sewerage. Owner, Village of Fort Erie. Consulting Engineers, Witmer & Brown, Chaplin Block, Bukalo, N.Y. A sewer and septic tank will be constructed.

Gleichen, Alta.

Tenders called for waterworks. Owner, Town of Gleichen. Sec.-treas., W. J. Burr; engineers, The John Galt Engineering Co., 317 Portage ave., Winnipeg. 1 54-in. x 14 ft. Return Tubular Boiler and Slack. 1 500-gal. per minute Duplex Steam Pump. 1 Air Compressor and Air-Lift Pump. Specifications, etc., at the offices of the engineers. Tenders received by the sec.-treas. until 18 o'clock August 11th.

Hamilton, Ont.

Tenders called for sewers. Owner, City of Hamilton; S. H. Kent, city clerk; city engineer, A. F. McCallum. Construction of sewers on the following: Beach road, 350 feet; Campbell avenue, Greenaway, Wentworth streets, Sherman, Rosemount, Scott and Beechwood avenues. Tenders addressed to C. H. Lees, Mayor, chairman board of control, care city clerk, received until August 9.

Hastings, Ont.

Tenders called for pavement. Owner, Village of Hastings. Clerk, Alex. Wilson. Construction of 50,000 sq. ft. of cement pavement. Tenders received until August 10th.

Moncton, N. B.

Extension of time for reservoir dam, $50,000. Owner, City of Moncton. Engineer, John Edington, Moncton. Dam 50 ft. high, 800 ft. long. Three tenders received but not opened. Time for receiving tenders extended until August 9th.

Tenders called for pipe line. Owner, City of Moncton. Engineer, John Edington; excavating and refilling trenches, laying and joining pipes from the City of Moncton to the new reservoir. Plans, specifications at office of City engineer. Tenders rceeived by city engineer until 5 p.m. August 15th, 1911.

Tenders to be called for sewerage. Owner, City of Moncton, N. B. City Engineer, John Edington. Extension of sewer on High street North, 800 ft. Victoria Square, 700 ft. Extension of sewer on St. George street 575 ft. N. B. The tender of LeBlanc & Govang for sewer on Cornhill street, $777.01 was accepted.

North Toronto, Ont.

Tenders called for main sewerage, No. 4 (east of Bayview ave.) Mayor, A. J. Brown. Consulting Engineer, T. Aird Murray, 303 Lumsden Building, Toronto. Providing and laying about 2,000 lin. ft. of 24-in. vitrified sewer pipe, with all necessary manholes and junctions. Plans, etc., at office of engineer. Work to be completed Sept. 30th. Tenders received until August 14th by F. Howe, chairman Works Committee, Eglinton Town Hall.

Port Atkinson, B. C.

Tenders called for reinforced concrete tower. Owner, Dept. of Marine and Fisheries, Ottawa. Deputy Minister, A. Johnston. Construction of a reinforced concrete tower, double dwelling and a fog alarm building. Plans, etc., at Dept. of Marine and Fisheries, Ottawa, at the agency of Dept., Victoria and at Post Office, Vancouver. Tenders received by Deputy Minister until noon Aug. 31st.

Point Grey, B. C.

By-laws carried for engineering. Sec.-treasurer, H. Floyd Kerrisdale. To borrow the sum of $349,908.50 for extending improving and opening roads; to borrow $501,259.80 to provide extensions and additional equipment for water service. Tenders to be received within 3 weeks for two road rollers 12 ton and 15 ton.

Quebec, Que.

Tenders called for steam boiler. Owner, Corporation of Quebec; city engineer, W. D. Baillairge. Each tender to be accompanied by a deposit of $400. Tenders received by engineer until 4 p.m., August 9th.

Regina, Sask.

The city will construct two and one-half miles of 72-in. sewer pipe.

Saskatoon, Sask.

By-laws to be submitted for engineering. City clerk, T. H. Truesdale. On August 24th the following by-laws will be submitted to ratepayers: $10,000 for improvement of Saskatchewan Drive, etc., $45,000 for house sewer and water connections; $60,000 for construction of subway at 19th street; $73,000 for extension to waterworks system; $75,000 for extensions to light and power system; $75,000 for construction of water filtration plant and improvement of sedimentation basin; $10,000 for concrete street crossings; $225,000 for construction of intercepting sewer and sewage disposal plant.

Stettler, Alta.

Contemplated sewerage system. Owner, Town of Stettler, Alta. Secretary-treasurer, D. Mitchell. The sewerage system here will be undertaken by town in 1912. For further information write sec.-treas.

St. Thomas, Ont.

Tenders called for waterworks. Owner, City of St. Thomas. City Engineer, M. H. Baker. Supply and installation of a 6,000,000-gal. centrifugal pump and steam engine. Specifications obtained from City Engineer. Advertisement in "Tenders and For Sale Department" of this issue . Tenders received until Aug. 19th.

St. Vital, Man.

Tenders called for pavement. Owner, Rural Municipality of St. Vital. Secy., E. A. Poulain; engineer, G. Mullen, 372 St. Jean Baptiste street, St. Boniface. St. Mary's road 18 ft. in width with one curb, approximate length one mile. Specifications, etc., at office of municipal engineer. All tenders to be accompanied by a marked cheque for 5 per cent. of the amount of tender. Tenders received by sec.-treas. until 8 p. m. August 14th.

Thorold, Ont.

Work delayed for road paving. Owner, Stamford township, etc. Parties concerned, Stamford Township and rest of Welland Cny. Engineer, J. C. Gardner, Niagara Falls, Ont. Engineer's report unfavorable; matter tied up indefinitely.

Toronto, Ont.

Tenders called for sewer. Owner, City of Toronto. G. R. Geary, Mayor. City Engineer, C. H. Rust; laying and jointing 36 in. reinforced pipe for the Toronto Junction Main Sewer. Specifications, etc., at office of engineer. Tenders received by Chairman Board of Control, until noon Aug. 8th.

Tenders called for lighting fixtures. Owner, City of Toronto; G. R. Geary, Chairman Board of Control. Supply and connection of electric lighting fixtures for filtration plant. Plans, etc., at office of City Engineer or at Water Works Department. Tenders received until noon August 15th by G. R. Geary.

Tenders called for pavement and sewers. Owner, City of Toronto, Chairman Board of Control, G. R. Geary. Construction of the following: asphalt pavements on seven streets; bitulithic pavement on two; brick block pavement on two; grading on two; concrete curbing on four; concrete walks on several; sewers on four. Tenders received until noon, August 15th, by G. R. Geary.

Vancouver, B. C.

Recommendations of Engineer for sewerage scheme. City Engineer, F. Fellowes, Vancouver. Proposal to construct a 4½ ft. dia. brick and concrete sewer from Clark Drive with temporary connection, with False Creek easterly into Hastings Townsite. Estimates on whole submitted later.

Winnipeg, Man.

Tenders called for sewer pipe. Owner, City of Winnipeg, Man.; secretary, Board of Control, M. Peterson. Supply of quantity of sewer pipe and specials. Specifications, etc., at office of City Engineer. Tenders received by Chairman, Board of Control, until 11 a.m., August 10.

Tenders called for pumping and compressor plant. Owner, Public Parks Board, 229 Chamber of Commerce, Winnipeg; chairman, C. W. Sharp; secretary, T. H. Blackwood. Installation of pumping and compressor plant. Plans, etc., at office of board. Tenders received until noon, August 12th, by C. W. Sharp.

Tenders called for grading. Owner, Public Park Board, Winnipeg, Man.; chairman, H. C. Stovel, 229 Chambers of Commerce, Winnipeg; secretary, J. H. Blackwood. Grading a double roadway on Inkster avenue, from Main street to Keewatin street. Plans, etc., upon application to Public Parks Board office. Tenders received by chairman until noon August 12th.

CONTRACTS AWARDED

Dresden, Ont.

Waterworks. Owner, Corporation of Dresden; town clerk, J. T. Bridgewater; consulting eningeer, F. W. Farncomb, C.E., 64 Bank of Toronto Chambers, London. Successful contractors, Canadian Fairbanks Co., Toronto, two pumps, $1,200; Kerr Engine Co., Walkerville, hydrants, $1,202; Cryderman & Farrell, Thamesville, laying pipe, about $1,254. Tenders for pipe not let yet.

Elora, Ont.

The contract for constructing the Drain No. 1, Maryborough, from lot 2, con. 14 to lot 9, con. 10, was awarded to D. B. Campbell, of Strathroy, $8,375.

Greenwood, Ont.

Tenders have been called for the erection of two cement abutments and cement floor for Greenwood Bridge, also cement abutments and cement floor for Gibb's bridge over Beaver river.

Nanaimo, B.C.

Paving. Owner, Corporation of Nanaimo; city engineer, Allan Waters; contractor, Worswick Paving Co., May and Linden streets, Victoria. Paving Commercial street, and part of Bastion, at $1.60 a superficial yard.

Southampton, Ont.

Filter Basin, $2,375. Owner, Town of Southampton; town clerk, J. C. Eckford; engineers, Bowman & Connor, Toronto; contractor, Andrew Gray, Southampton. Owing to lateness of season the intake pipe and crib were not included.

Vancouver, B.C.

The contract for roadways, curbs, etc., at the new court house, has been awarded to Robert McLean & Co., 744 Hastings street west, for about $16,500. Work will be commenced at once.

Winnipeg, Man.

City contracts have been awarded to Engineer of Construction for the following: Asphalt No. 1 pavements—Morley avenue, Yale avenue, Harvard avenue, Dromore avenue and Harrow street. Water mains — Westminster avenue, Machray avenue and Spruce street. Granolithic walks—South side of Martin avenue, noth side of Castle avenue. Sewer—Rosedale avenue.

Railroads, Bridges and Wharves

Calgary, Alta.

The council have been asked to have plans prepared for a high level bridge across the Bow river at Centre street, in order that a by-law may be submitted to the people early in the year 1912.

Fort William, Ont.

Work in progress for freight shed, $50,000. Owner, G. T. R., Fort William. 300 x 100, frame, corrugated iron, pile foundation. Company doing its own work.

Work in progress for coal dock, $50,000. Owner, James Murphy, Fort William. 50 ft. high, concrete and frame 250 x 87 . Work to be under supervision of owner by day labor. Up-to-date handling plant to be erected in connection. N. B. Nothing settled with regard to Canadian Swift Co. to date.

Halifax, N.S.

The Halifax Electric Tramway Co. will construct half a mile of car line on Pleasant street, estimated cost, $5,000.

Montreal, Que.

Tenders called for harbor buildings. Owner, Harbor Commissioners; secretary, David Sneath. Chief engineer, F. W. Cowie. Construction of Harbor Yard Building and Locomotive House. Plans, etc., upon application to F. W. Cowie. Tenders received by secretary until noon Aug. 5th.

The Intercolonial Ry. p opose carrying out extensive improvements, including the double tracking of the line from Chaudier Junction to Levis, and other principal sections, also the construction of subways in Quebec Province and East. A. W. Campbell, chairman of the Railway Commission.

Ottawa, Ont.

Tenders called for trainmen's houses. Owner, Commissioners of Transcontinental Railway, Ottawa. . Secretary, P. E. Ryan. Erection of trainmen's houses at the following points: District A—Napadogan and Edmundston, prov. of New Brunswick. B.—Laurier St. Foye and Fitzpatrick, prov. of Quebec. D.—Cochrane, province of Ontario. F.—Graham & Redditt, prov. of Ontario and Transcona, in the province of Manitoba. Plans, etc at office of Gordon Grant, chief engineer, Ottawa, and the District offices at St. John, Quebec, Cochrane and St. Boniface, Man. Tenders received by secretary until August 21st.

Papineauville, Que.

Tenders called for wharf. (Labelle County). Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers. Construction of wharf. Plans, etc., at Department and at office of the District Engineer, Merchants Bank Building, St. James street, Montreal, and on application to local postmaster. Tenders received by secretary until 4 p.m. Aug. 23rd.

Pincher Creek, Alta.

Contemplated bridge north of Brockelt. Owner, Dept. Public Works, Edmonton. Deputy Commissioner, John Stocks. Bridge in Summerview section over old Man. River. The west end bridge and the South Fork will not be erected this year.

Port Arthur, Ont.

Agreement signed for dock, $230,000. Parties concerned, City of Pt. Arthur, and Can. Pacific Railway. City Clerk, J. McTeigue. Secy. C. P. R., W. H. Baker. Company will build new dock —site to be provided for Union Depot for 3 railway companies if action is taken within 3 years time.

Regina, Sask.

Contracts to be let for street railway (9 miles). Owner, City of Regina. Commissioner, McPherson. City engineer, L. A. Thornton, City Hall Survey made. Contract let for 7 miles, remainder to be received about September. About 7 miles additional lines to be constructed next year.

Stellarton, N. S.

Work in progress for addition to engine house, 288 ft. long. Owner, Dept. of Railways and Canals, Ottawa. A new h.p. boiler and other equipment to be added to the machine shop.

Toronto, Ont.

Equipment required for municipal railway system. Owner, City of Toronto; W. A. Littlejohn, city clerk; city engineer, C. H. Rust. Trolley poles, trolley wire, nuts, spikes, bolts and angle bars in connection with municipal railway system. Tenders called in about ten days.

Township of Zone, Ont.

Tenders called for two bridges. (Thamesville). Commissioners, J. Buchanan & A. Dowswell. Concrete and steel. Plans, etc., of No. 1 at residence of John Buchanan, Lot 10, Con. 1, Zone; No. 2 at residence of A. Dowswell, Lot 8, Con. 3. Tenders received until Aug. 21st.

Victoria, B.C.

The C. P. R. are contemplating the construction of a new spur line from Three Forks to Bear Lake, providing transportation for the Lucky Jim Mining Property.

Winnipeg, Man.

Surveys to be made for approaches to bridge, St. Andrews Locks, 15 miles from Winnipeg. Owner, Dominion Government. Resident engineer, W Z. Earle, 501 Ashdown Building, Main st., Winnipeg. Negotiations [illegible]

[illegible] of property for approaches to steel bridge [illegible], surveys are ordered

CONTRACTS AWARDED

Ottawa, Ont.
Cement platform, etc. Owner, Grand Trunk Railway Company; contractor, A. S. Metcalfe Co., Montreal. Cement platform and canopy over track terminal, [illegible] Union Station.

Port Arthur, Ont.
Storage dam, Current River Park. Owner, City of Port Arthur; city clerk, J. McTeigue; contractor, Seaman & Penniman. Completion of the service reservoir dam.

Public Buildings, Churches, Schools, etc.

Battleford, Sask.
Tenders called for hospital for insane. Owner, Dept. of Public Works, Regina. Architects, Story & Van Egmond, Regina. Erection of hospital. Plans, etc., on application to F. T. Robinson, Dept. Regina; or to Messrs. Story & Van Egmond. Tenders received until noon Aug. 5th.

Tenders called for town hall. Owner, Town of Battleford; H. C. Adams, secy.-treasurer. Town Engineer, W. Kitson, Battleford. Supply of materials and labor for erection of town hall. Plans at office of town engineer; at office of Canadian Engineer, Winnipeg; and at office of Messrs. Gorman, Clancey & Grindley, Edmonton. Tenders received until August 14th. Separate tenders will be received for the heating plant. Advertisement in "Tenders and For Sale Department" of this issue.

Brandon, Man.
Electrical supplies required for hospital for insane. Owner, Department of Public Works, Winnipeg; Minister of Public Works, R. Rogers. Wiring and electrical supplies. Plans, etc., at office of Provincial Architect, Fort Garry Court, Winnipeg, or on application to Mr. A. Pue, Clerk of Works, Brandon. Tenders received until noon, August 8, by R. Rogers.

Calgary, Alta.
The congregation of St. Mary's Church have purchased the property at the corner of 13th avenue and 6th st. west, on which property they propose to erect a fine cathedral.

Dartmouth, N. S.
Tenders called for hospital building. Owner, Public Works and Mines Dept., Halifax; Commr., E. H. Armstrong. Architect, H. Gates, 90 Hollis street, Halifax, N. S. Erection of brick building at the Nova Scotia Hospital. Plans, etc., at office of architect. Tenders received by commissioner until Aug. 7th.

Edmonton, Alta.
Plans being prepared for exhibition buildings. Owner, Exhibition Association. (A) Horse barn, (B) store building, (C) concentrated shop, (B) 3 storey addition, frame with concrete foundation, (c) 2 storey. Tenders called as soon as specifications are ready.

Guelph, Ont.
Tenders called for winter fair building. Owner, Winter Fair Board; president, J. Bright, London. Sec., A. P. Westervelt. Architect, W. A. Mahoney, Guelph. Brick, 1-storey, 263 x 40, concrete foundation, cement work, sheet metal work, metal ceiling, hot air No. 25 Guelph Stove Co. or equal; metal ceiling, interlocking shingle, Oshawa; hardware necessary for live stock. Tenders closed August 4th.

Plans being prepared for Y. M. C. A. Building. Architects, W. A. Mahoney, Guelph, and Mills Hutton, Hamilton. Chairman Building Committee, H. G. Cockburn, Guelph; 4-storeys, 75 x 95, stone and brick, stone foundation, hot water heating, electric lighting, interior finish, quarter oak and georgia pine, cement work, cut stone, brick, terracotta, tile, fireproofing, structural and ornamental iron columns, plate, art and prismatic glass. Tenders called in about two weeks, close about Aug. 20.

Hamilton, Ont.
Specifications in progress for re-building asylum. Owner, Provincial Government. Architect, F. R. Heaks, Parliament Buildings, Toronto. 1st storey brick, hot water heating, electric lighting. Estimated expenditure, $15,000. Part of building destroyed by fire.

Work in progress for church, $10,000. (Ruth and Clinton). Owner, Roman Catholic Diocese, Mgnr., Mahoney, Dean. Architect, M. White, 119 Wellington street N., Hamilton. 1-storey and basement, 90 x 40, brick and stone, stone foundation, hot air heating, electric lighting, shingle roofing, interior finish Georgia pine, cement work, cut stone, brick, electrical work, art glass. Bulk contract with architect.

Havelock, Ont.
Tenders called for public school. Owner, Board of Trustees, Havelock. Chairman, H. C. Kindred. Steam heating system. Plans, etc., at Mr. J. E. Belcher's, Peterboro.

Justice, Man.
Tenders called for school, $5,000. Architect, W. W. Blair, Winnipeg. One storey, two rooms, stone foundation, brick veneer, hot air heating, roofing and sheathing paper, shingle stain. Plans with architect, also Barclay & O'Hara, Brandon. McDiarmid & Clarke, Brandon; T. J. Pentland, Justice. Tenders addressed to A. M. Robertson, Chairman School Board ,Justice, until August 14th.

Medicine Hat, Alta.
Plans being prepared for church, $75,000. (Fifth avenue). Owner, Methodist Church, H. F. Forester, secretary. Architect, W. T. Williams, Medicine Hat. 70 x 110, brick and cut stone, concrete foundation, shingle roof. Detailed plans not complete. Excavation tenders to be in by Aug. 1st. Tenders called shortly for building.

Michel, B. C.
Tenders required for heating system. Owner, Public School Board. Secretary, J. A. Murray. Installation of hot air heating system. Tenders to include necessary excavating for same. Work to be completed before Sept. 1st.

Milestone, Sask.
Plans being prepared for church, $6,000. Owner, Roman Catholic Church. Architect, W. W. Hilton, Regina, Sask. 1-storey, 38 x 60, 20 ft. ceiling, cement block, foundation of cement block, artificial stone, shingle stain, interior finish, plaster. Tenders to be called probably within a month.

Montreal, Que.
Contemplated city hall, $10,000,000. Owner, City of Montreal. City Clerk, L. O. David. It is proposed to build in the square bounded by Mount Royal avenue, Rachel street, St. Denis and St. Lawrence boulevards.

Equipment required for fire hall. City clerk, L. O. David; owner, Board of Control, City Hall. Automobile trucks, one for engine and one for aerial ladder, one combination engine, 1,000 gals., one auto hose wagon, two steam pumps.

Tenders to be called for hippodrome, St. Catherine street east. Owner, F. Lapointe, 625 St. Catherine street east, Montreal; architect, Mr. Theo. Daoust, 90 St. James street, Montreal. Six storeys, 150 x 100, fireproof construction, concrete foundation, electric lighting, flat roof, interior finish, marble, cut stone, New York brick, tile, fireproofing, armored and reinforced concrete, artificial stone, structural iron, fire escapes, freight elevator, sheet metal work, cornice, skylights, iron columns, ornamental, machinery. Building to seat 7,500. Tenders received about end of August.

Mount Hamilton, Ont.
Contemplated, church. Owner, Methodist Church of Canada; pastor, Rev. S. W. Holden. Building occupied by Daniel Cotter purchased, possession obtained by end of year.

New Westminster, B.C.
The decorating and interior work on the new Y. M. C. A. will shortly be commenced.

Peterborough, Ont.
Tenders called for school, school section No. 16, Otonabee. Owner, School Board, S. S. No. 16; secretary, C. F. Kitney, Box 838, Peterborough, Ont. Erection of school, tenders to be based on using material in old school house as far as possible. Plans, etc., with David Spears. Tenders received by David Spears, Box 725, Peterborough, until August 10th.

Port Pitt, Sask.
A new school house will be erected here. J. B. Sim, chairman.

Stettler, Alta.
Contemplated buildings. Opera house (Block 7). Plans immature as yet. Estimated cost, $5,000. Bottling plant being installed in block 2, Main street

Strathmore, Alta.
A market building will be erected in the near future. Geo. Wells, and D. F. Boissevan are on the committee in charge.

Toronto, Ont.
Work in progress for re-building tower, Queen's Park. Owner, Victoria University, Queen's Park; architect, Sproat & Rolph, 90 Yonge street, Toronto. 54 feet copper flashing, wood and tile.

Plans being changed for Y. M. C. A. building, College street. Owner, Y. M. C. A.; secretary, G. A. Warburton; architects, Burke, Horwood & White, 28

Toronto street, Toronto. Plans changed to admit of dormitory on Grenville street, connected with College street building.

Tenders called for new isolation hospital. Owner, City of Toronto; G. R. Geary, Mayor. Supply of hardware, light fixtures, and weather strips. Plans specifications, etc., at office of the City Architect, City Hall, Toronto. Tenders received by Chairman Board of Control until noon, August 8, 1911.

Tenders called for heating system. (Police Station No. 4, Wilton avenue). Owner, City of Toronto. Mayor, G. R. Geary. Complete supply and installation of hot water heating system. Plans, etc., at office of the Property Department, City Hall. Tenders received by Chairman Board of Control until noon Aug. 8th.

Work in progress for 5 buildings, $9,000. (Hamilton street). Owner, John Stacy, Oshawa. Architect, G. B. Hoole 79 Adelaide street east, Toronto. 2½ storeys, 40 x 80, brick, stone foundation, hot air heating, combination lighting, open plumbing, shingle roofing, cement work, shingle roofing, cement work, brick, cornice, electrical work, plate glass. Owner will build by day labor.

Tenders to be called for lodge, $25,000, east side Dovercourt road. Owner, I. O. O. F., Sovereign Lodge; architect, W. G. Hunt, 679 Dovercourt road, Toronto. 4 storeys, brick and stone, stone foundation, electric lighting, felt and gravel roofing, cement work, cut stone, brick, fireproofing, artificial stone, metallic lath, structural iron, sheet metal work, cornice, electric work, plate glass. Tenders to be called in about three weeks.

Tenders to be called for obstetrics building. Owner, Toronto General Hospital, Toronto. Architect, Darling & Pearson, 2 Leader Lane, Toronto. 4-storeys, brick and stone, stone foundation, forced hot water heating, electric lighting, asphalt roofing, cement work, cut stone, brick, terra cotta, concrete fireproofing, structural and ornamental iron, passenger elevator, sheet metal work, fireproof doors and windows, asbestos materials, electrical work, steel beams, plate and art glass. Tenders called shortly.

Tenders to be called for chapel, $4,500, Shaw and Irene streets. Owner, St. John Evangelical Lutheran Church Chairman Building Committee, W. Shewee, 58 Emerson avenue, Toronto; architect, W. E. Noffke, 26 Central Chambers, Ottawa. 48 x 30, brick and concrete and stucco, concrete foundation, cement work, artificial stone, sheet metal work, cornice, hot air heating, electric lighting, shingle roof, plate and art glass. Walls to be covered with Beaver board. Tenders to be called about August 8th.

Tenders called for club-house. (16-22 Gerrard East). Owner, Burke, Horwood & White, Toronto street, Toronto. 3-storeys and basement, brick, brick foundation, hot water heating, electric lighting, open plumbing, asphalt, felt and gravel roofing, interior finish, hardwood finish, cement work, cut stone, marble, brick, tile, fireproofing, reinforced concrete, artificial stone, metallic lath, structural and ornamental iron, sheet metal work, metal roofing, cornice, skylights, electrical work, iron columns, plate, art and prismatic glass, iron crane. Tenders close Aug. 4th.

Uxbridge, Ont.

New tenders called for post office. Owner, Dept. of Public Works; R. C. Desrochers, secretary. Two tenders received, lowest tenders being considered excessive, new bids will be called for.

Tenders called for public building. Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers. Erection of public building. Plans, etc. at Dept. and on application to clerk of Wks. Postal Station F., Toronto. Tenders received by secretary until Aug. 21st.

Whitby, Ont.

Tenders to be called for Collegiate Institute, $25,000. Owner, Whitby Board of Education; architect, Munro & Mead, Chancey Chambers, Hamilton. Two and one-half storeys, 110 x 40, brick, stone foundation, cut stone, reinforced concrete, artificial stone, structural iron, iron columns, steel beams, metallic lath, fire escapes, electric bells, cornice, hot water heating, slate roof, interior finish ash. Tenders received in about two weeks by Board of Education.

CONTRACTS AWARDED

Brockville, Ont.

The contracts for a $14,000 Maternity Ward to the General Hospital has been awarded as follows: Masonry anad cement, W. Patterson; carpentry, H. Dunham; plastering, McKee Bros; heating and plumbing, Brown & Semple; sheet metal and iron work, B. Dillon; stone work, W. Patterson, all of Brockville.

North Vancouver, B.C.

The contract for the erection of the Ridgeway school has been awarded to Smith Bros., North Vancouver, for $47,326.

Ottawa, Ont.

Tenders have been opened for the new heating plant of the Carnegie Library, and contract awarded to Chandler & Co., cost $1,660.

Regina, Sask.

The contract for the Regina College buildings has been awarded to R. J. Leckie, Regina.

Toronto, Ont.

The following tenders for additions to schools have been accepted: Harbord Collegiate Institute, mason work, $915, S. Pollock; Hillcrest school, mason work, $715, Hamm & Reid; carpenter work, $242, Frank Armstrong; plumbing, $935, Keith & Fitzsimmons, Lansdowne school — carpenter work, $310, Oliver C. Pook; plumbing, $450, Keith & Fitzsimmons. Earl Grey school—Plumbing, $56, Lewis Le Graw; Norway school—Carpenter work, $185, Wm. Williamson. Perth avenue school —Carpenter work, $781, Frank Armstrong. Roden school — Carpenter work, $421, Wm. Williamson. Palmerston avenue school—Concrete work, $353, Orr Bros. Strathcona school—Mason work, $325, Orr Bros. George street school—Painting, $115, James Taylor. Brown school—Sodding, $350, Orr Bros.

Vancouver, B.C.

Church, $72,000, Thurlow and Pendrill streets. Owner, First Congregational Church, Pastor, Rev. J. K. Unsworth; architect, Sharpe & Thompson, 536 Hastings west, Vancouver; superintendent of construction, William Neve, 1090 Thurlow street, Vancouver; contractor, Adams Construction Co., 44 Seymour st., $23,000. Brick work and foundation will be done by this company. Besides the face brick, over 200,000 common brick will be needed.

Residences

Saskatoon, Sask.

Work in progress for apartment house, $12,000, Fourth avenue and 22nd street. Owner, P. M. Ayers, Saskatoon. Architect, G. H. Gugenhagen. Forty or fifty rooms, brick. Permit has been granted.

Toronto, Ont.

E. Prine, 15 Garnet avenue, pair dwellings, west side Gladstone avenue, 2-storey, 40 x 24, brick, brick foundation shingle roofing, $4,000.

James H. Dodd & Sons, 962 Gerrard street east, pair dwellings, $4,400, 6-8 Marjory avenue, 2 storeys, 28 x 32, brick front and roughcast, concrete foundation, shingle roofing.

A. D. Petrie, 356 Dupont street, pair dwellings, $5,000, 2 storeys, 32 ft. 8 in. x 44 ft., brick and stone, stone foundation, shingle, felt and gravel roofing.

Thos. Royle, 75 Symington avenue, pair dwellings, $3,200, 2 storeys, 30 x 36, brick and stone, stone foundation, felt and gravel roofing.

Work in progress for four dwellings, $2,500, west side Seymour avenue. Owner, W. Gladman, 659 Pape avenue, Toronto. Two storeys, 55 x 22, brick front and roughcast, brick foundation, stove heating, shingle roofing. Work will be done by day labor.

Work in progress for apartments, $13,000. (St. Charles and St. Nicholas). Owner, Thos. McLaughlin, Toronto. Architects, Davis & Moore, 176 St. Clarens avenue. 2 storey, 104 x 30, brick, stone foundation, cement work, plate glass, tile, mantels. Work will be done by day labor.

Tenders called for residence, $2,500. (E. S. Logan avenue). Owner, A. & A. Grant, 318 Dupont street, Toronto. 2½ storeys, 22 ft. 6 in. x 34, brick, stone foundation, electric lighting, shingle roofing, cement work, cut stone, brick, tile, mantels, electrical work, shingle stain, plate glass. Tenders will be open for a week on all trades but carpentry.

Work in progress for 3 dwellings, $6,000. (Sunnyside and Constance). Owner, A. T. Stewart, High Park Gardens and Indian Road, Toronto. 2½ storeys, 47 x 44, brick, stone foundation, hot water heating, open plumbing, slate and felt roofing, cement work, brick, tile, mantels, cornice, electric work, electric bells. Work will be done by day labor.

Tenders called for pair of dwellings, $4,000, west side Ridley Gardens. Owner, R. J. Roger, 31 Beverley street, Toronto. Two and one-half storeys, 44 ft. x 49 ft. 6 in., brick and stone, stone foundation, hot air heating, combination lighting, open plumbing, shingle roofing, hardwood floors. Tenders will be received for heating, lighting and plumbing.

Tenders called for pair dwellings, [illegible] (Perth avenue). Owner, James [illegible], 180 Ontario street, Toronto. Architect, J. M. Cowan, 65 Adelaide street east, Toronto. 2-storeys, 40 x 32 ft. 6 in., brick, stone foundation, hot air heating, electric lighting, open plumbing, shingle, felt and gravel roofing, cement work, plate glass. Tenders will be open for a week.

Work in progress for residence, $6,100. (Crescent road). Owner, A. Foulds, Toronto. Architect, Eden Smith & Son, 199 Yonge street, Toronto. General contractors, Woodley Bros., 183 Avenue road, Toronto. 2½ storeys, 41 x 50, brick, brick foundation, hot water heating, electric lighting, interior finish hardwood floors, cement work, brick, tile. sheet metal work, plate glass, etc.

Tenders called for apartment house, $40,000, Dundas street near Queen. Owner, S. Hager, Dundas street; architect, W. G. Hunt, 679 Dovercourt road. Four storeys, 117 x 88, stone foundation, brick and stone, cement work, cut stone, sheet metal work, felt and gravel roof, artificial stone, steel beams, structural iron, steam heating, telephone system, electric lighting. Tenders closed in two weeks.

Work in progress for dwelling, $4,500, 66 Ben Lomond avenue. Owner, Mrs. A. L. Davis, 66 Ben Lomond avenue, Toronto; architect, Sproat & Rolph, 90 Yonge street, Toronto; general contractor, Alex. MacLeod, 57 Ben Lomond avenue. Two storeys, 32 x 40, concrete foundation, frame and stucco, hot water heating, combination lighting, shingle roofing, cement work, tile, mantels, electrical work.

Work in progress for apartment house, $6,000. (Harbord street). Owner, Thompson & Mitchell, 446 Markham street, Toronto. Architect, J. M. Cowan, 66 Adelaide street east, Toronto, 2-storey, 40 x 77, brick, stone foundation, hot water heating, electric lighting, open plumbing, felt and gravel roofing, cement work, cut stone, brick, tile, mantels, metallic lath, electrical work, electric bells, plate glass. Work will be done by day labor.

Work in progress for pair of dwellings, $4,200, Conduit and Uttley streets. Owner, Fisher Bros., 20 Rowland avenue, Toronto; architect, A. S. Fisher, 158 Cowan avenue, Toronto. Two stys. 41 ft. 9 in. x 23 ft., brick, brick foundation, hot air heating, electric lighting, open plumbing, shingle roofing, oak floors, cement work, brick, tile mantels, cornice, electrical work, electric bells, shingle stain, plate glass. Work will be done by day labor.

Tenders called for seven dwellings, $21,000, Beverley and Baldwin streets, Owner, D. Lavine, 182 Beverley street, Toronto; architect, S. A. Waggett, 61 Bleecker street, Toronto. Two and one-half storeys, 37 ft. x 52 ft. 6 in., brick, stone foundation, hot water heating, electric lighting, open plumbing, cement work, cut stone, brick, tile, mantels, electrical work, electric bells. Owner will receive tenders for a week for all trades but masonry and carpentry.

Work in progress for residence, Castle Frank Road. Owner, D. A. Burns, 1 Hawthorne, Toronto; architect, J. A. MacKenzie, 208 Lumsden Building, Toronto. Two and one-half storeys, 44 ft. 9 in. x 36 ft., brick, brick foundation, hot water heating, slate roofing, interior finish hardwood, cement work, cut stone, brick, tile, mantels, artificial stone, metallic lath, structural iron, electric work, steel beams, plate glass. Specifications call for papering and decorating, bathroom fittings, electrical fixtures.

Work in progress on alterations to residence, $12,000. (73 St. George street. Owner, W. H. Brouse, 19 Colborne street, Toronto. Architect, F. S. Baker, Traders Bank Building, Toronto. Carpenter contractor, T. W. Hall, 64 Glencairn avenue, Eglinton. 2½ storeys, stone, brick, steel and wood, concrete foundation, hot water heating, electric lighting, slate, felt and gravel roofing, interior finish hardwood floors, cement work, cut stone, brick, tile, mantels, structural iron, sheet metal work, cornice, electrical work, plate and art glass, etc.

Vancouver, B.C.

Campbell & Dawson are the architects for two bungalows, $3,000 each.

Apartment house, $34,000. (Salisbury Dr. and Parker street). Owner, Caledonian Investment Co., 417 Cordova, Vancouver. General contractor, Robt. McLean & Co., Pacific Building, Vancouver. 3-storeys, 122 x 61, brick.

Winnipeg, Man.

Tenders are wanted by the owner, 1632 Ross avenue, for the erection of four cottages.

The central Garage Co. will erect a larger and better building on Water st. in place of the one destroyed by fire on May 21. The building will be fireproof throughout.

Plans being prepared for residence, $7,000, Walnut street. Owner, Edgar Prain; architect, Edgar Prain, 313 Fort street, Winnipeg. Two storeys, solid brick, stone foundation, shingle roof, hot water heating, electric lighting, oak interior finish.

Work in progress for residence, $12,000, Greenwood Place. Owner, J. Farquhar, Winnipeg; architect, Edgar Prain, 313 Fort street, Winnipeg. Two and one-half storeys, stone foundation, frame construction, hot water heating, electric lighting, shingle roofing.

Work in progress for residence, $6,000. (Grosvenor avenue). Owner, Samuel Tait, Winnipeg, Man. Architect, H. B. Rugh, Union Bank Building, Winnipeg. 2 storeys, stone foundation, steam heating, electric lighting, shingle roofing. Owner is building, material supplied as needed.

CONTRACTS AWARDED

Brantford, Ont.

Heating and plumbing contract not yet let for residence, $3,000. (Dufferin avenue). Owner, J. C. Walker, 129 Chatham street, Brantford. General contractor, J. C. Walker. Masonry, cement and plastering, Alex. Reynolds, 40 McMurray street, Brantford. 1½ storeys, 30 x 30, brick, concrete foundation. General contract awarded July 29th. Building to be completed December 1st.

Apartment house, $5,500. Owner, W. K. Halloran, Brantford, Ont.; architect, Taylor & Taylor, Brantford; general contractor, Ingleby & Fitness, Brantford. Two storeys and basement, brick, stone facings, concrete foundation, steam heating, electric lighting, slate roofing, mantels, artificial stone, electrical work, telephone system, interior finish hardwood and pine. Heating and plumbing contract not let yet.

Fort William, Ont.

Residence, $5,000. Owner, Jas. A. Davidson, Fort William; architect, R. E. Mason, Fort William; general contractor, R. MacLeod, Fort William. Three storeys, 30 x 36, brick veneer, concrete foundation.

Port Arthur, Ont.

The contract for a 2½-storey brick veneer and concrete residence for W. F. Fortune, has been awarded to Geo. Otto, Port Arthur. H. Halton, architect.

Toronto, Ont.

Williams & Noxen, 31 Globe avenue, pair dwellings, north side Dixon avenue, $4,200, 2 storeys, 33 x 28, brick, brick, foundation, electric lighting, felt and gravel roofing, H. Elliott, 40 Globe avenue, architect.

Victoria, B. C.

The contract for the metal work in connection with the new suspension bridge to be erected by the Provincial Government over Churn Creek has been awarded to Messrs. A. G. Langley & Co., of Vancouver.

Business Buildings and Industrial Plants

Alliston, Ont.

Equipment required for factory. Dynamo to generate 100 h.p.; a second-hand one, if in good condition, would do; water power at Nicolston. Specifications with Mr. Wm. McBride, president Board of Trade. Equipment installed as soon as factory is erected.

Calgary, Alta.

David McDougal, Ninth avenue, will build a six-storey block, costing $90,000.

Plans are completed for the new immigration hall, and construction will commence at once.

It is planned by a syndicate from Pittsburg to build a $40,000 hotel at the cor. of Third street west and Fifteenth avenue.

Plans prepared for business block, (Eight avenue). Owner, B. Stringer, Real Estate Brokers. 130 x 50, 10 storeys, fireproof. Building to be fitted up for a bank on ground floor. Excavation will be done this fall. Superstructure commenced this spring.

It is announced by Industrial Commissioner Miller, of Calgary, that Morris & Co., of Chicago, Ill., will establish a packing plant here, to be a duplicate of their Oklahoma City plant, costing $3,000,000, the building will cover twenty acres of ground.

Tenders called for equipment for department store. Owner, Hudson's Bay Company. Architects, Burke, Horwood & White, 28 Toronto street, Toronto. Boilers, engines, dynamos, switchboard, storage battery, electric wiring, vacuum cleaning, pneumatic tubes, sprinklers, steam fitting, plumbing, refrigeration, steel smokestack. Tenders received by architects until noon, Aug. 12th.

Tenders called for customs fittings. Owner, Department of Public Works, Ottawa; secretary, R. C. Desrochers. Alterations and addition to Customs fittings. Plans, eac., on application to J. J. O'Gara, Res. Arch., Calgary, and at above department. Tenders received until 4 p.m., August 9th, by secretary.

Coalmont, B. C.

Tenders closed for hotel, $20,000. Owner, G. Marcotte, Coalmont. Architect, D. R. Boucher. 3 storeys 55 x 76, frame, concrete foundation, steam or hot water heating, gasoline lighting, iron roofing, interior finish fir, cement work, brick, metal roofing, sheathing, plate glass. Tenders closed on July 29, 1911.

Daysland, Alta.

Contemplated installation of machinery. Owner, The Burrard Grain Co., Ltd., Daysland. Company are planning to install flour mill machinery in connection with their elevator.

Edmonton, Alta.

Specifications in progress for Abbatoir. Owner, P. Burns & Co., Calgary. Brick, cement work, terra cotta, electric work, pipe covering, fireproof doors steel beams, machinery. Nothing definite as to when work will go ahead; foundation likely to be put in this fall.

Hamilton, Ont.

Machinery required for factory. (Sherman avenue north). Owner, Standard Underground Cable Co. Architects, Prack & Perrine, Hamilton. General contractor, H. G. Christmas, Sherman avenue, North. 1-storey 58 x 25, steel, brick, stone foundation, cement work, structural iron, steem beams, reinforced concrete roof, fireproof doors, cornice, skylights. Building to be used for carpenter's shop. Woodworking machinery required.

Kentville, N. S.

Work in progress for carriage and auto building. Owner, Nova Scotia Carriage and Motor Co. 3-storey 100 x 100, frame construction. Extension to present factory to be started at once.

Lethbridge, Alta.

The Canadian Rand Drill Co., Ltd., are contemplating the building of a warehouse. S. A. Williams, manager.

The P. Burns Co. will erect a business block on the 25-foot lot between the Acadia block and the store recently occupied by Bawden Bros.

Work in progress for store. (Broad avenue south). Owner, P. Burns & Co., Calgary. Architect, E. E. Carver, Lethbridge; 1 basement, 25 x 100, brick, concrete foundation, steam heating, electric lighting, tile, refrigerator, plate glass. Temporary structure, refrigeratory machinery may be removed from present quarters.

London, Ont.

The contract for the new Masonic Temple has been awarded to W. S. Davidson, $46,000. The contract includes all excavating, brick work, stone work and interior construction.

Lulu Island, B. C.

Work in progress for mill, $400,000 Owner, British Canadian Lumber Co., 1605 Georgia street, Vancouver. Architect, A. B. Pracna, 821 Pender street, W., Vancouver. Frame construction. Company will build themselves but will take tenders on separate contract and machinery. Estimated output, 250,000 ft.

Lytton, B.C.

Plans prepared for hotel, Block 8. Architect, Wright & McIntyre, 1410 Dominion Trust Building, Vancouver. Three storeys, 100 x 50, frame. Work done by day labor; work to commence immediately.

Niagara Falls, Ont.

Equipment required for factory. Owners, McGlashan Clark Co., Niagara Falls, Ont. Required: punch press, rolls etc., suitable machinery for spoons and cutlery. The addition to factory will be ready for installation of machinery in about 10 days.

North Vancouver, B. C.

Tenders called for livery, $3,000. (4th street). Owner, Mr. Dumas, N. Vancouver. Architect, A. J. Henderson, N. Vancouver. 46 x 80, frame construction.

Ottawa, Ont.

The Ottawa Rowing Club and the Ottawa Canoe Club plan the erection of a joint club house half a mile below the present site of the canoe club.

Purchase of property for factory. (Aylmer road). Owner, Beaver Board Co., Head street, Buffalo. President, William McGlashen. A model village in connection with the factory is contemplated.

Parry Sound, Ont.

New industry, factory. Owner, Brown Smith Turning Co., Broadbent, Ont. The company has rented the premises formerly used as a planing mill on River street. Machinery being installed.

Port Arthur, Ont.

On July 8 the ratepayers passed a bylaw granting assistance to J. B. McArthur for the purpose of establishing a match factory.

Preston, Ont.

Plans to be prepared for business block, $25,000. (King street). Owners, Messrs. Geo. Bernherdt & Co., Preston. Architect, H. Gale Legg, Preston. 3-storey 66 x 80, red pressed brick, and red stone. Building to be used for stores.

Regina, Sask.

Plans being prepared for automobile garage, $50,000. (Broad street). Owner, The Garage Ltd., capital $100,000. Architect, W. W. Hilton. 2-storey and basement, 100 x 125 solid brick and steel, fireproofing, structural iron, cement foundation. (footings deep enough to allow 3 additional storeys later) cement floor, metal ceilings, 2 elevators.

Saskatoon, Sask.

Equipment required for departmental store, $250,000. Owner, J. F. Cairns, Saskatoon. Architects, Brown & Vallance, Winnipeg; C. E. Sheppard, manager. 4-storey, fireproof, reinforced construction, terra-cotta front. Plans with architect. Interior fittings to the amount of $50,000 have yet to be purchased. Contracts awarded for construction.

Sault Ste. Marie, Ont.

Plans are prepared and tenders called for the new Algoma Central depot, which will cost upwards of one hundred thousand dollars.

Shawingan Lake, Vancouver Island, B. C.

Contemplated hotel, $30,000. Owner, British Columbia & Vancouver Island Hotel Co., Victoria. Architect, Not chosen.

Strathcona, Alta.

Plans prepared for factory. Parties interested, J. S. Dennis, Canada Irrigation Co.; L. P. Strong, Alberta Pacific Grain Co., and J. M. Davidson, Crown Lumber Co., all of Calgary. According to present plans building will be completed this fall.

St. John, N.B.

There has been a conference of civic and provincial representatives to consider the advisability of making a bid for the shipbuilding plant that is to construct the Canadian naval vessels, and in view of the fact that Halifax and the Nova Scotia government are willing to contribute $400,000, and Sydney has $300,000 available, it is considered certain that $500,000 will be offered by St. John and the provincial government.

Toronto, Ont.

Excavation tenders called for factory, Liberty street, Fraser avenue, etc. Owner, Gillett Company, King street, Toronto; architect, A. R. Denison & Stephenson, 20 King street west, Toronto. Excavation of foundations and basement. Plans, etc., at offics of architects. Tenders received until noon, August 8th.

Work in progress for reconstruction of warehouse, $8,000, Scott and Esplanade streets. Owner, H. P. Eckhardt & Co., Front and Scott streets, Toronto; architect, J. Francis Brown, Board of Trade Building, Toronto. Brick, felt and gravel roofing, cement work, brick, fireproofing, sheet metal work, metal siding, cornice, fireproof doors and windows, plate glass.

Work in progress for stores and dwellings, $10,000. (E. S. Bathurst and Dupont). Owner, Freehold Realty Co., 521 Front street East, Toronto. General contractor, Wm. Clark & Son, 224 Augusta avenue, Toronto. 2 storeys, 96 x 20, brick, brick foundation, hot water heating, electric lighting, open plumbing, felt and gravel roofing, interior finish maple floors, cement work, marble, tile, electrical work, cornice, plate glass, refrigerator, store fittings.

Work in progress for addition to building. (108 Adelaide street East). Owner, E. S. Boone, 108-110 Adelaide street East, Toronto. Architect, Chadwick & Beckett, Toronto street, Toronto. 1-storey 64 x 52, brick, hot water heating, electric lighting, felt and gravel roofing, cement work, brick, artificial stone, structural iron, freight elevator, fireproof doors, steel beams, prismatic glass, concrete flooring.

Work in progress for warehouse. Owner, G. J. Foy, Ltd., 3 Front street E., Toronto. Owner has purchased Nos. 32 and 34 Front street west and intends erecting a modern warehouse thereon.

Work in progress for warehouse, $35,000, Osler and Pelham avenues. Owner, Dodge Manufacturing Company, 138 Bay street, Toronto; architects, Stand-

(Continued on page 66)

Tenders and For Sale Department

CITY OF GUELPH

Tenders

EXTENSION OF TIME

Tenders will be received by F. J. Moore, City Clerk, Guelph, Ontario, for the construction of a reinforced concrete arch bridge and viaduct over the Canadian Pacific Railway and the [illegible], Guelph, up till twelve o'clock, noon, **Wednesday, August 16th, 1911.**

Approximate amount of concrete 572 yards.

A marked cheque for $400 is to accompany the tender.

Forms of tender may be obtained from, and plans and specifications seen at the office of the City Engineer, Gueiph, or at the offices of the Contract Record and Canadian Engineer, Toronto, Ont.

Plans and specifications may also be obtained for the sum of $5.00 per set, which will be returned upon return of plans.

Lowest or any tender not necessarily accepted.

L. MALCOLM,
Acting City Engineer.

Guelph, August 5th, 1911. 30-31-32

TOWN OF WILKIE

Sealed tenders will be received by T. A. Dinsley, Secretary-Treasurer of the Town of Wilkie, until noon, **Monday, August 21, 1911,** for supply and delivery of the following machinery, materials, and performance of certain works:

Tender A.—Electrical Machinery—
(1) One 60 kw. 3-phase, 60 cycle, 2,200 volt a.c. Generator.
(2) One Exciter for above.
(3) One marble switchboard, instruments and switches.
(4) Three 2,200 voltmeters, back-geared to pumps.
(5) Five transformers for lighting system.
(6) Series Tungsten street lighting system.
(7) Approximately 25 cwt. of weather-proof copper wire (line material, guy wire, arms, pins, insulators, etc.)
(8) Cedar poles.

Tender B.—One 100 1 H.P. Internal Combustion Engine—

Tender C.—Pumping Machinery—
(1) One working head and deep well cylinder.
(2) One-half million gallon pump.
(3) One air compressor.
(4) Necessary shaftings and belting.

Tender D.—
One Pneumatic Storage Tank.

Tender E.—
Approximately 1,100 ft. 8-inch. c.i. water pipe.
Approximately 4,800 ft. 6-inch c.i. water pipe.
Approximately 2,000 ft. 4-inch c.i. water pipe.
Approximately 15 hydrants and 22 valves.

Tender F.—
Trenching, laying cast iron water pipes, hydrants, valves, etc., and back filling.

Tender G.—
Erection of power house and construction of reservoir.

Plans and specifications may be seen at the office of the secretary-treasurer of the Town of Wilkie, or on application to the Engineers, McArthur & Murphy, Room 8, Bottomly Block, Saskatoon, Sask.

A marked cheque for five per cent. of amount of the tender must accompany each bid.

The lowest or any tender not necessarily accepted.

McARTHUR & MURPHY, Engineers
Bottomly Block, Saskatoon, Sask.

T. A. DINSLEY, Secretary-Treasurer,
Wilkie, Sask.

30-31

Trench Machines

Parsons—Cuts trench 27 in. to 60 in., to 20 ft. deep, fine order.

Parsons—With Mattes Back Filler, cuts trench 28 in. to 78 in. to 20 ft. deep. Overhauled and first class. Write us if you have anything to sell, or if in want of anything.

THE MALES CO.
No. 82 Perin Building, Cincinnati, O.

Tenders

Tenders will be received by the undersigned until **August 19th, 1911,** for supplying and installing a six-million gallon Centrifugal Pump and Steam Engine. Specifications may be obtained from the City Engineer. Tenders must be plainly marked on the outside.

M. H. BAKER,
City Engineer.

St. Thomas, July 29, 1911. 31-33

FOR SALE

Complete Electric Generating Set, consisting of Leonard Peerless steam engine direct connected to 150 k.w. Canadian General Electric generator, 2,300 volts, 60 cycles; also condenser, switchboard, steam and exhaust piping, spare parts for engine and generator, and everything constituting the complete set as at present installed in the Thomas street lighting station of the Town of Brockville. This machine is in first-class order, having only been used on peak loads. It is now being replaced by a larger Belliss & Morcom engine with Swedish G. E. generator. Full particulars and price can be obtained from Laurie & Lamb, Consulting Engineers, Board of Trade Building, Montreal.

28-35

To Contractors

Separate tenders endorsed "Tender for New Government House," addressed to the undersigned, will be received at this Department until noon of **Tuesday, August 22nd,** for the stone and brick work, fireproofing, steel work, roofing and carpenter work, for the new Government House in Chorley Park, Rosedale, Toronto. Plans and specifications may be seen at this department.

An accepted bank cheque payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender, and the bona fide signatures and addresses of two sureties, must accompany each tender. Cheque will be forfeited to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after acceptance. The department will not be bound to accept the lowest or any tender.

By order,
H. F. McNAUGHTEN,
Secretary Public Works Department.

Department of Public Works, Ontario, Toronto, July 21st, 1911.

Newspapers publishing this advertisement without authority will not be paid for it.

30-31-32-33

CITY OF MOOSE JAW
Saskatchewan

Sewer and Water Extensions

Sealed tenders will be received by the City of Moose Jaw, addressed to the undersigned City Clerk, until 8.30 p.m., on **Monday, August 14th, 1911,** for the laying of approximately 16,885 lin. feet of sewer and water extensions, as well as for the shpply of all cast iron and vitrified tile pipe and specials, etc.

Any tender received after the above stated time will be declared informal.

Plans and specifications for the construction work may be seen at the office of the City Engineer, and specifications for the supply of materials may be obtained from the City Engineer's office upon application.

The lowest or any tender not necessarily accepted.

J. M. WILSON, City Engineer.
W. F. HEAL, City Clerk.

Moose Jaw, Sask., July 21, 1911. 31-32

Department of Railways and Canals

Intercolonial Railway

Passenger Station, Truro, Nova Scotia

Sealed tenders addressed to the undersigned and endorsed "Tender for Truro Station," will be received at this office until 12 o'clock noon, on **Friday, the 25th of August, 1911,** for the construction of a stone Passenger station at Truro, Nova Scotia.

Plans, specifications and form of contract to be entered into may be seen and full information obtained on and after 10th of August, 1911, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Intercolonial Railway at Moncton, N.B., or at the office of the Board of Trade, Halifax.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $10,000 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, August 4th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.

32-33

Crushers for Sale

No. 8 Austin Gyratory, complete with 75-ft. elevator and revolving screen.

No. 7½ Gates Gyratory Crusher, style "D."

No. 6 Gates Gyratory Crusher, style "D."

Also smaller sizes at attractive prices, all absolutely in OK condition and guaranteed by us.

WILLIS SHAW MACHINERY CO.,
39 South LaSalle Street,
c Chicago, Ill.

Town of Battleford, Sask

Tenders

FOR THE ERECTION OF

A New Town Hall

Sealed tenders, addressed to the Secretary-Treasurer, will be received by the Town Council of Battleford until 12 o'clock noon, **August 14th**, for supplying all materials and erecting a Town Hall.

Plans may be seen and specifications and form of tender obtained at the office of the Town Engineer, Battleford. Plans may also be seen at the office of the Canadian Engineer, Winnipeg, and at the office of Messrs. Gorman, Clancey & Grindley, Edmonton.

Separate tenders will be received for the heating plant.

Tenders must be accompanied by an accepted cheque for five per cent. (5 p.c.) of the amount of the tender.

WILLIAM KITSON,
Town Engineer.
H. C. ADAMS,
31-31 Secretary-Treasurer.

Department of Railways & Canals, Canada

WELLAND CANAL

NOTICE TO CONTRACTORS

Sealed tenders addressed to the undersigned and endorsed "Tenders for Turning Basin, Thorold, will be received at this office until 16 o'clock on **Monday, the 21st day of August, 1911.**

Plans, specifications and form of contract to be entered into, can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Superintending Engineer, St. Catherines, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $1,500 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum tender, which sum will be forfeited if the party tendering declines entering into the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 5th August, 1911

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 32-33

For Sale

One second-hand No. 1 Smith concrete mixer, with engine and boiler complete. Apply to A. J. Cromar, Brantford, Ont. 32-33

Tenders

Tenders will be received by the undersigned until noon, **Monday, August 14th**, for the completion of the clear water reservoir at St. Thomas waterworks. Plans and specifications may be seen and form of tender obtained at the office of the City Engineer.

GEO. K. CROCKER,
Chairman of Board of Water Commissioners.
32-33

Corporation of the City of Three Rivers

Public Notice

Sealed tenders addressed to the undersigned and marked "Tender for Steel Bridge," will be received at the City Hall, Three Rivers, up to the 25th instant at 4 o'clock p.m., for the erection of a steel bridge with two concrete abutments on the River St. Maurice, the span to be of 200 feet in length.

Plans and specifications may be seen at the office of Mr. Benj. Bourgeois, city engineer, No. 174 Notre Dame street.

An accepted cheque for 10 per cent. of the amount of tender must accompany each tender.

The lowest or any tender not necessarily accepted.

L. T. DESAULNIERS,
Sec.-Treasurer.

City Hall, Three Rivers,
August 4th, 1911. 32-34

Department of Railways and Canals, Canada

QUEBEC BRIDGE

NOTICE TO CONTRACTORS

Sealed tenders addressed to the undersigned and endorsed "Tender for Removal of old Bridge Material," will be received at this office until 16 o'clock, on **Monday, the 21st August, 1911,** for the removal of unused material delivered on the ground intended for use in connection with the construction of the old Quebec Bridge.

Specifications, forms of tender and full information can be obtained on and after this date, at the office of the secretary of the Department of Railways and Canals, Ottawa, at the office of the Chairman and Chief Engineer of the Board of Engineers of the Quebec Bridge, Canadian Express Building, Montreal, and at their office, Board of Trade Building, Quebec.

An accepted bank cheque for the sum of $13,000, made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 5th August, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 32-33

TOWN OF BERLIN

Sealed tenders addressed to A. H. Millar, town clerk, will be received up to 6 p.m., **August 17th**, for the construction of a reinforced concrete bridge on Albert street, Berlin. Plans and specifications may be seen at the office of Herbert Johnston, Town Engineer.

The lowest or any tender not necessarily accepted.

H. A. DIETRICH,
Chairman, Board of Works.
Berlin, August 5th, 1911. 32-33

To Contractors

Sealed bids will be received by the undersigned up to noon of **Monday, August 21st**, for all trades required in the erection of a nine-storey, stone, brick, and steel fireproof building in Richmond street west, Toronto.

The lowest or any tender not necessarily accepted.

F. S. BAKER, Architect,
Traders Bank Building,
32-33 Toronto

CITY OF SASKATOON

Storm Sewers and Paving

TENDERS WANTED

Sealed tenders, addressed to the City Commissioners, Saskatoon, and marked as to contents, will be received up to 12 o'clock noon on **Friday, August 18th, 1911,** for the following work and materials, viz.:—

Contract No. 97.—All labor necessary for laying pipes, and furnishing certain materials, according to the following quantities:—

1,080 lin. ft. 15-in. vitrified tile pipe.
2,150 lin. ft. 12-in. vitrified tile pipe.
1,760 lin. ft. 10-in. vitrified tile pipe.
6,840 lin. ft. 8-in. vitrified tile pipe.
2,865 lin. ft. 8-in. vitrified tile pipe.
(catch basin branches)
2,205 lin. ft. 42-in. reinforced concrete pipe.

Contract No. 98.—Furnishing 2,205 lineal feet reinforced concrete sewer pipe; and 6 reinforced concrete manholes, 42-in. in diameter.

Contract No. 99.—Furnishing 40 manhole frames and covers, and 92 catch basin gullies.

Contract No. 100.—Laying approximately 21,600 square yards of pavement, and grading incident tereto.

Plans, specifications, instructions to bidders, general conditions, and forms of tender may be seen at the office of George T. Clark, City Engineer, Saskatoon. Copies of instructions to bidders, and forms of tender will be furnished on application to the City Engineer, but copies of plans and specifications will not be furnished.

The lowest or any tender not necessarily accepted.

JAS. CLINSKILL,
W. B. NEIL, City Commissioners.
E. M. SNELL,
Saskatoon, Sask., August 2nd, 1911. 32-33

Mixer Wanted

Wanted a second-hand Ransom Concrete Mixer, with or without power. Ed. Couray, 435 Mark street, Peterborough, Ont. 32-33

Positions Vacant

Advertisements under this heading two cents a word per insertion.. Minimum charge 50 cents

WANTED [illegible] customed to detailing simple trusses and general [illegible]

Business Buildings and Industrial Plants

(Continued from page 61)

[illegible] Structural Co., 111 Manning Chambers. [illegible] storeys, [illegible] x [illegible], concrete [illegible], concrete foundation, cement work [illegible] structural iron, fireproof doors or windows, steel beams, asphalt roof, hot water or steam heating, electrical work.

Work in progress for pair of stores and dwellings, $7,000, north side Bloor street west. Owner, Hambly & Chaplin, Toronto; architect, W. G. Hunt, 679 Dovercourt road, Toronto; general contractor, E. White, 35 D'Arcy street, Toronto. Two storeys, 84 ft. x 34 ft. 6 in., stone foundation, brick, electric lighting, hot water heating, felt and gravel roofing, interior maple flooring, steel beams, cut stone, artificial stone, plate [illegible]

Work in progress for factory, $18,000, Royce and Lansdowne. Owner, Standard Sanitary Manufacturing Co., Royce avenue, Toronto; contractor, Standard Structural Co., 111 Manning Arcade. One storey, 146 ft. 8 in. x 47 ft. 2 in., steel, brick and concrete, concrete foundation, hot water or steam heating, concrete and felt roofing, reinforced concrete, metallic lath, structural iron, fireproof doors and windows, steel beams, Work will be done by day labor.

Vancouver, B. C.

The British Columbia Electric Railway Co. has awarded the contract for the construction of a new freight shed at the foot of Carrall street near False Creek, to D. Mathewson, of this city.

Tenders called for business buildings. Owner, Crane Co. & Dominic Burns, Vancouver. General contractors, Norton, Griffiths Steel Construction Company, Labor Temple, Vancouver. Crane building ornamental iron work, marble tile, cut stone, plastering, and heating. Burns building plumbing, heating, electric wiring, mill work, marble and tiling. Tenders on sub-contracts received until Aug. 11th. Work held up owing to strike.

Tenders called for store. (Park Drive and Venables street). Owner, J. A. Malkin, 1400 Bute street. Architect, S. B. Birds, Loo Building, Vancouver. 2-storey, 44 x 120, frame, concrete foundation. Tenders called after July 26th.

Tenders to be called for store and rooming house, $20,000. (Cedar Cottage and Westminster road). Owner, Clem Mills & Co. Architect, Townsend & Townsend, 812 Robson street, Vancouver. 3-storey, frame, 8 stores on ground floor and 8 suites of rooms on other two floors. Tenders received after Aug. 15th.

Tenders called for store and rooming house, $40,000. (579 Richmond street). Owner, Capt. H. Pybus. Architect, S. B. Birds, Loo Building, Vancouver. 4-storey, 25 x 120, reinforced concrete. Tenders closed Aug. 4.

Victoria, B.C.

Hoult Horton, architect, has prepared plans for Norton Griffiths Steel Construction Co. for erection of an eight-storey building on Government, Humboldt and Gordon streets.

Winnipeg, Man.

Frank Lindsay will erect a modern seven-storey office building on the triangle formed by the intersection of Garry with Notre Dame and Ellice avenues, cost, $175,000.

Specifications prepared for office building. (West Yard Ft. Rouge). Owner, Canadian Northern Railroad. Architects, R. B. Pratt, Winnipeg. 2-storey and basement, 68 x 31, concrete and frame, concrete foundation and steam heating, electric lighting, Ready roofing. Tenders closed on July 29th.

The Canadian Pacific plan to add two storeys to their depot next year. They also propose to erect a large four-storey building north of the train sheds and a first-class waiting room for travellers will be provided on the ground floor of the Royal Alexandra annex.

Tenders called for fans and engine for incinerator plant. Owner, City of Winnipeg. Secy. Board of Control, M. Peterson. Supply of steel plate forced and induced draft fans, together with engines for operation of same. Specifications at office of city engineer, 233 James avenue. Tenders received by Chairman Board of Control until 11 a. m., Aug. 8, 1911.

Tenders to be called for office building. (Lombard street). Owner, Union Trust Co., Winnipeg. Architect, John Atchison, Bank of Toronto Building, Winnipeg. 12-storeys, 101 x 27½, steel frame, fireproof, tile, pile and concrete foundation, two storeys granite, concrete balance, steam heating, electric lighting, 3 elevators. Tenders to be called shortly.

Tenders to be called for bank. Owner, Sterling Bank, Portage avenue, Winnipeg; architect, James Chisholm & Son. General contractor, Carter-Halls-Aldinger Co., Winnipeg. Steel and fireproof construction, interior finish, marble and oak. Tenders to be called for interior fittings; 2 high speed electric elevators; steam heat, electric lighting, marble and terrazo floor.

Work in progress for warehouse, $100,000. Owner, Canadian Fairbanks, Ltd., Winnipeg. Architect, Browne & Vallance, Winnipeg. General Contractor, Geo. H. Archibald, Winnipeg. Reinforced concrete, terra cotta trimmed front.

Materials required for ink factory, $9,000. (McGee street). Owner, W. Peacock. Architect, D. W. Bellhouse, Canada Building, Winnipeg. 2-storey, brick and stone, concrete foundation, electric lighting, steam heating, tar and gravel roof, cement work, cut stone, brick concrete blocks, electrical work, telephone, electric bells.

Extension of plant, cold storage, Mead, Tonseca and Higgins avenue. Owner, Manitoba Cold Storage Company, Winnipeg; manager, S. H. MacCall; architect, not yet appointed. 8 storeys and basement, 367 x 70, concrete and steel construction; chambers lined with 6-in. cork insulators.

Yorkton, Sask.

The Board of Trade is negotiating with a company who contemplate the establishment of a factory here for the manufacture of stoves, ranges, etc.

CONTRACTS AWARDED

Brockville, Ont.

Manufacturing Building. Owner, Canada Carriage Co., Brockville; general contractor, Byers & Anglin, Montreal. Two storeys, 100 x 50, brick. Contract was awarded July 27.

Chatham, Ont.

Alterations to store, $2,500, King st. Owner, W. Gordon, Chatham; architect, J. L. Wilson & Son, Chatham; general contractor, Chatham Building Company; masonry, W. Draper; carpentry, H. Payment; sheet metal, M. Clements; iron work, A. E. Drew; stone work, J. & J. Oldershaw. Contract let July 31st. Building to be completed September 15th, 1911.

Edmonton, Alta.

Warehouse. Owner, Ames Holden McCready; architect, Jas. Henderson; general contractor, Foot & Purcell, Edmonton. Three storeys and basement, brick, steam heating, electric lighting, vaults, freight elevator, plate glass. Contract signed July 20th.

Fort William, Ont .

Store, $3,000, Simpson street. Owner, Mr. Kaslar, Simpson street, Fort William; architect, Hood & Scott, Fort William; general contractor, C. Mathieu, Fort William. Two storeys, solid brick, concrete foundation, 25 x 65.

North Battleford, Sask.

The contract for the Imperial Bank of Commerce has been awarded to J. Broley.

N. Vancouver, B.C.

Stores, $2,260; architect, A. J. Henderson, N. Vancouver; general contractor, J. J. Young, Collingwood, E. Vancouver. One storey, 26 x 80. Contract awarded July 22.

Revelstoke, B.C.

Geo. D. Shaw, of Revelstoke, has been awarded general contract for the erection of H. F. McKinnon's new 3-storey brick and concrete building, 40 x 95 feet. Cost, $20,000.

Saskatoon, Sask.

Warehouse, $56,000. Owner, Canadian Fairbanks Co., Winnipeg; architect, Brown & Vallance, Winnipeg; C. E. Sheppard, manager; general contractor, James McDiarmid, Winnipeg. Brick and stone frontage, reinforced concrete.

Vancouver, B.C.

The contract for the $10,000 office builiing on Granville and Georgia sts. has been awarded to J. J. Dissette, 570 Granville street.

The contract for the new five-storey hotel to be erected in North Vancouver has been awarded to Alexander Craig, North Vancouver. Work will be commenced at once.

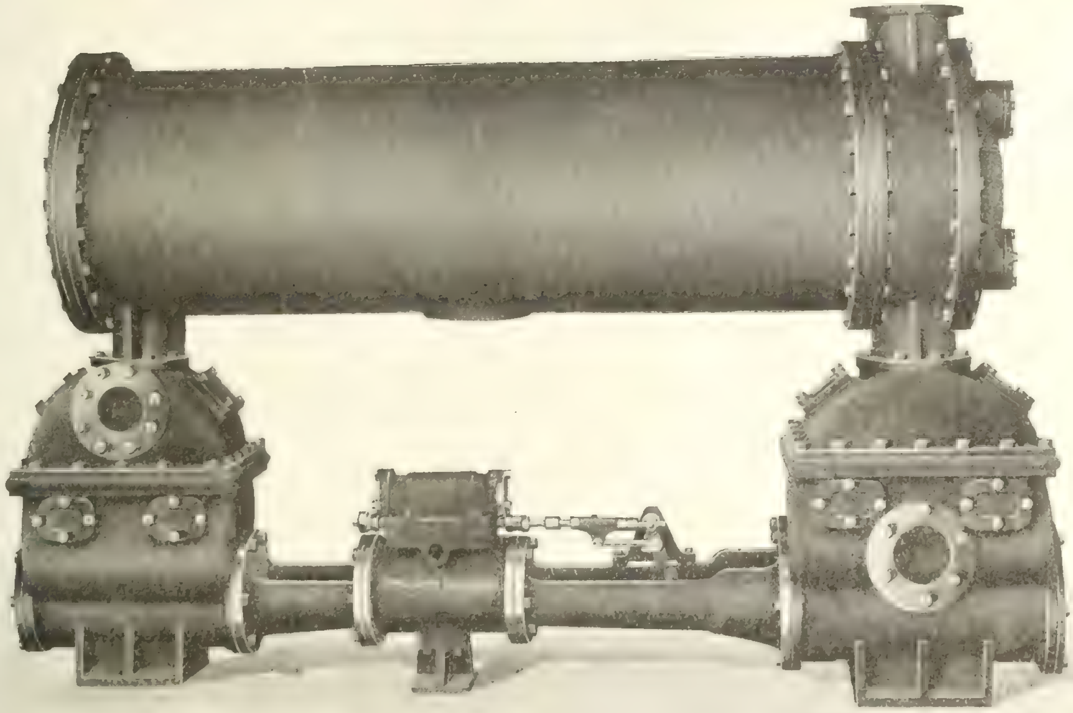
Hotel, $8,000, Cordova street; architect, Henry B. Watson, Holden Building, Vancouver; general contractor, Matthew Hall, Vancouver. Contract awarded July 22.

Power Plants, Electricity and Telephones

Edmonton, Alta.

New negotiations opened for power development. Owner, City of Edmonton. City Engineer, A. T. Latornell. Another company backed by English syndicate after water rights at Grand

CONDENSORS



Condensor built by The John Inglis Co., Limited

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

Let us Submit Prices.

The John Inglis Company
Limited

Engineers and Boilermakers

14 Strachan Ave., TORONTO, Canada

[illegible] Plans have been prepared by Mr. Neville, C. E., Edmonton.

Middleton, N. S.

Equipment required for electric lighting system. Owner, Town of Middleton, N. S. James A. Gates, town clerk. Expenditure of about $15,000 to $20,000 to be made. Ratepayers have voted appropriation.

Niagara Falls, Ont.

Electric equipment required. Owner, J. Robinson & Sons, Niagara Falls, Ont. Equipment wanted, lathe drill press, sharper electric rectifier; also motor shafting, pulleys, etc. None purchased as yet.

Work in progress for power plant, $66,000. Owner, American Cyanide Co., Niagara Falls. Extension of factory. D. Dick & Sons Ltd., Welland, Ont., have taken contract for roofing, $10,000. Advertisement in "Tenders and For Sale Department" of this issue.

Port Arthur, Ont.

The Port Arthur & Fort William Electric Street Railway will extend the Arthur street branch one-half mile.

Portage la Prairie, Man.

Purchase of plant of Central Electric Co. Owner, City of Portage la Prairie; clerk, D. McGowan. The offer of $110,000 has been accepted by the company. A by-law will probably come before the people in September.

Saskatoon, Sask.

By-laws to be submitted for building and machinery. City clerk, T. H. Truesdale. On August 24th the following by-laws will be submitted to raise $25,000 for city stable and storehouse; $80,000 for erection of power house and purchase of site; $135,000 for purchase of machinery for new electric light and power plant; $35,000 for erection of Nurses' Home.

Victoria, B.C.

The contract for wiring the new B. C. Electric Railway station, which is to be built at the corner of Carroll and Hastings, by McDonald & Wilson, has been awarded to Mather, Yuill & Co., Ltd., 429 Pender street west

Miscellaneous

Hamilton, Ont.

Mr. Byrnes, 355 Main street, will erect a garage, 24 x 20 feet, $2,000. James Markle, architect, 179 Market street.

Buildings contemplated or in progress in Hamilton, July 31, 1911:—H. Thombs, 56 Stinton street, brick dwelling on Argue street, for H. Catchpole, $2,000; Mr. Chertkoff, 172 Barton street east, four frame dwellings on Douglas street, $4,000; Mr. Chertkoff, 172 Barton street east, for the erection of eleven frame dwellings on Mars avenue, $12,000; A. Bauer, 88 Campbell avenue, frame dwelling, $300; P. M. Cook, 806 Bank of Hamilton Building, frame dwelling on King street, for Fred Hill, 4 William, $1,800; O. Beecraft, 17 Kinrade avenue, frame dwelling on Bristol street, for F. Tansley, 215 West avenue north, $1,000; Wm. Walker, 433 King st. west, frame dwelling on Argyle avenue, $300; O. Gilvear, 87 Kinrade avenue, frame dwelling, Graham avenue, $500; Chas. Cordell, 497 Cameron east, frame dwelling, Harvey street, $1,000; E. B. Patterson, 167½ King street east, brick dwelling, Catharine street, for T. Jackson, $2,000; F. Bower, 37 Barton west, frame dwelling, Fairview avenue, $800.

Ottawa, Ont.

Tenders called for fire hose. Owner, City of Ottawa; city clerk, John Henderson. Supply of 2,000 feet of 2½-inch double jacket rubber lined fire hose, complete with couplings (Higbee thread) made to Ottawa standard and guaranteed to test pressure of 400 pounds. Hose to be guaranteed against defective manufacture, mildew or rot for three years. Accepted cheque for ten per cent. of amount of tender to accompany each tender. For further information apply to chief of fire department. Tenders received by city clerk until 12 o'clock, August 15th.

Vancouver, B. C.

Buildings contemplated or in progress in the City of Vancouver, August 4, 1911: C. H. Cottrell, Water street, two stores, $12,000, contractor, Sinclair & Pearson, 998 12th street west; L. W. Parren, 1030 Harwood street, two stores, $1,800, 2728 18th avenue west; C. Phillips, 1905 8th street west, two stores, $3,000; B. C. Sugar Refining Co., E. Hastings, one store, $1,000.

Winnipeg, Man.

Buildings contemplated or in progress in Winnipeg, August 4, 1911: J. E. Sparrow, 277 Mountain avenue, dwelling, $3,000, Bannerman avenue; J. T. Watson, 58 Sherbrooke, dwelling, $2,900, Alverstone street. Greenwood & Thompson, dwelling, $2,700, Ross avenue; J. T. Watson, builder; Robinson & Zelbowitz, 539 Pritchard avenue, double dwelling, $1,800, west side Burnell street.

BRITISH MADE

Terra Cotta

the Product of

King Brothers, Limited, Stourbridge, England

Proprietors of Stourbridge Clays

REDS -- BUFF -- STONE -- GREY

and all Colors, Glazed and Unglazed

Estimates on application by

The Toronto Plate Glass Importing Co. Limited

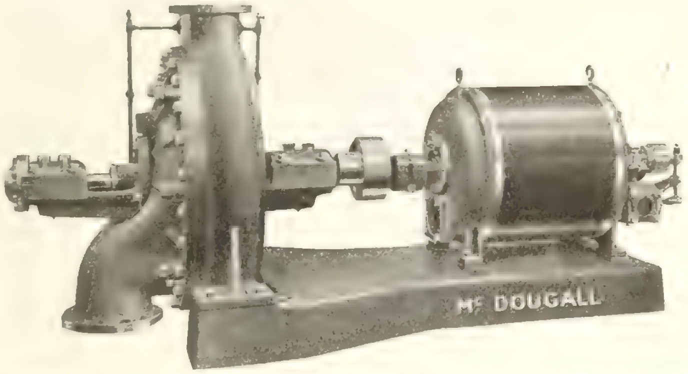
Tel. M. 3877 Don Roadway, TORONTO

Worthington Turbine Pumps

Built for High Speed

The two principal factors which have assisted in the development of the turbine pump are the high speed motor and the steam turbine. The high speeds thus obtained make it possible to design a pump with comparatively few stages and with impellers of small diameter. This not only increases the efficiency of the pump, but also considerably reduces the cost.

See Bulletin 109



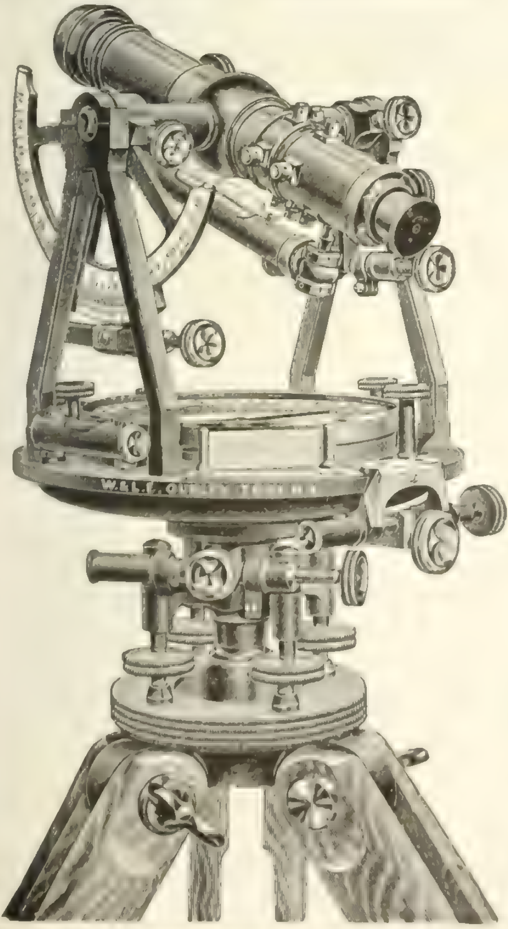
Capacity 1,000 Imperial or 1,200 U.S. Gallons per minute. 150 Feet. 75 H.P. Steam Turbine at 1,500 r.p.m. National Transcontinental Railway.

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

LIMITED

WORKS:
512 William St., MONTREAL

SALES OFFICES:
MONTREAL, TORONTO, COBALT, WINNIPEG, CALGARY, VANCOUVER


W. & L. E. GURLEY TROY N.Y.

1845 **1911**

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

Transits
Y Levels
Compasses
Plane Tables
Current Meters
Levelling Rods
Chains
Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

"Hammer Brand"
Hard Wall Plaster

HARD-WALL PLASTER
HAMMER
A. I. & N.
HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Works Destroyed by Fire
— Now Rebuilding

Producers of the Celebrated
"Peerless"
Bedford Stone

Bedford Indiana
Limestone

Mill Blocks
Sawed Planed and Turned Stone

W. McMILLAN & SON
(Incorporated)
General Offices
Chamber of Commerce Building
CHICAGO, ILL.

Quarries and Mills { Bedford, Ind.
Bloomington, Ind.

Fred Holmes, President C. P. Holmes, Sec'y-Treas.

Telephone North 663

Fred Holmes & Sons
Limited
Building Contractors

1113 Yonge St., Toronto

Armstrong
CRANES

Built for Every Service
up to 75 tons capacity

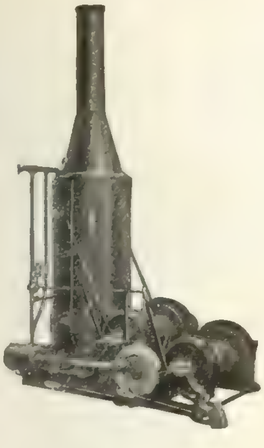
Electric Traveling Cranes, Standard
Electric Traveling Cranes, Special
Electric Gantry Cranes
Electric Jib Cranes
Hand Operated Cranes
Locomotive Cranes
Hydraulic Cranes

H. J. ARMSTRONG
Engineer and Manufacturer
Markdale, Ont., Can.

RADIAL BRICK
CHIMNEYS

H. R. HEINICKE, Inc.
65 Victoria St., Montreal, Que.
Mail Building, Toronto, Ont.
147 Fourth Ave., New York

Consult Us—We are Experts—30 years' experience—Chimneys in all parts of the world



Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

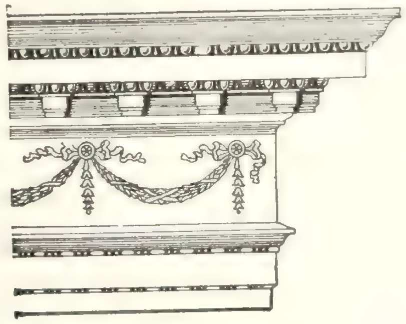
Marsh & Henthorn, Limited

Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

A good appearance is a letter of recommendation—a house well built, a monument to the builder."

Superior Quality Material and Workmanship Count

Metallic Cornices



are the MOST ARTISTIC, MOST DURABLE and MOST EASILY ERECTED cornices you can place on any building.
They are made of sheet copper or galvanized steel and are absolutely rust proof.
"Metallic" cornices can be furnished in any design desired to suit your drawings and specifications.
Let us give you prices and full information--send us your specifications. Our catalogue of sheet metal building materials, No. 70, will interest you. Write for it.

Manufacturers 1951

The Metallic Roofing Co Limited
TORONTO & WINNIPEG

Terra-Cotta Fireproofing

Get an Estimate from

ROBERT BENNETT

Contractor
Scarboro Junction, P. O.

☞ Over 25 years experience in U. S. and Canada

PHONE BEACH 4

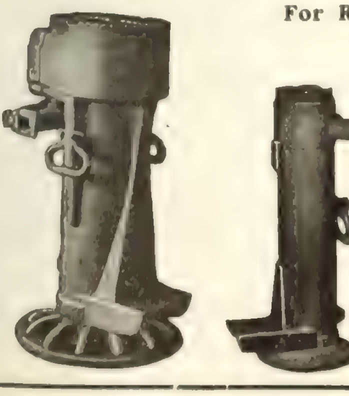
The Carey Roof Standard
CAREY'S FLEXIBLE CEMENT ROOFING

TO PROVE TO YOU the high, standardized construction and composition of Carey's Roofing, we want to send you BOOKLET AND SAMPLE FREE, and give you practical information regarding Carey's Roofing based on 25 years' actual time-proved tests Carey's Roofing is equally adapted to flat or steep surfaces, wood sheathing, tile or concrete. Whether your contract is large or small, we want to show you the advantage of using a standardized roofing material THE PHILIP CAREY MFG. CO., 50 WAYNE AVE Cincinnati, O. 50 Branches.

"FAMOUS FOR DURABILITY"

THE H. & E. PATENT BALL-BEARING LIFTING JACKS

For Railway and Bridge Work, Contractors' and Builders' Use



Made by practical Jack Builders. Material: best grades of malleable iron and steel Fully guaranteed as to durability and efficiency The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used Sizes from 8 to 50 tons capacity now complete. Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

MANUFACTURED BY

H. & E. Lifting Jack Company

Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal

STAR

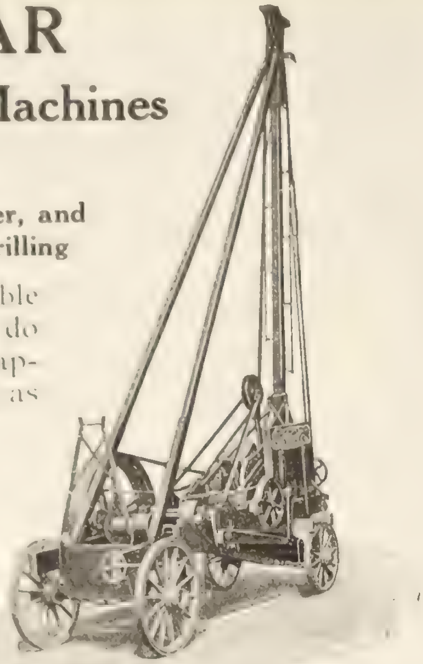
Drilling Machines

FOR

Oil, Gas, Water, and Blast Hole Drilling

No other Portable Machine will do the work as cheaply, quickly and as satisfactorily as the STAR Machine.

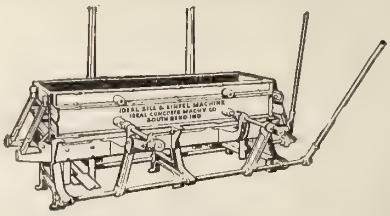
There are reasons for it.



No. 31—Gasoline Machine—250 feet Capacity

The General Machinery Co., Ltd.

526-7 Traders Bank Building
TORONTO, ONT.



MR. CONTRACTOR!

Make your own Sills, Lintels, Coping.

There is no need to use stone at all, nor pay big prices for special cutting. With

'IDEAL' SILL-LINTEL and DIMENSION MACHINES

You can make all your Sills, Heads, Caps, Dentil work, Cornices, String and Frieze Courses, Water Tables, etc.—and by facing the Concrete Blocks with white cement, white sand and marble dust or screened granite, the result is equal to the finest natural stone, granite or marble.

The "Ideal" machines will produce Dimension Stone of almost any size required on contract.

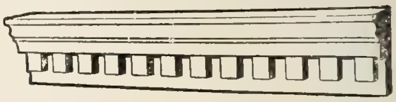
Let us send you our catalogue on "Ideal" Sill-Lintel and Dimension Machines—and also show you how you can close contracts and make money by owning and operating them.

IDEAL CONCRETE MACHINERY CO., LIMITED

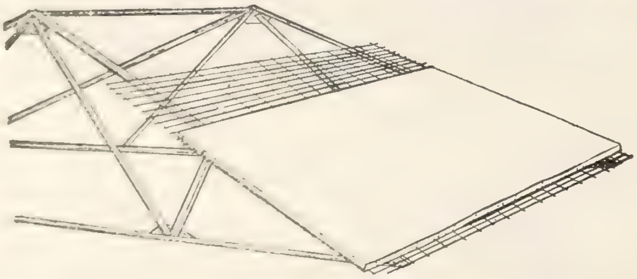
Dept. B - London, Ont.

We can also supply Concrete Mixers, Ornamental Molds, Tile Molds, Fence Post Molds, Tycrete Waterproofing, etc.

Reliable and energetic agents wanted in every locality



Concrete Reinforcement



Our Bonding is a Crimped STEEL WIRE Fabric

Can be made in any Length or Width to suit you.

We claim in the erection of roofs and floors our continuous reinforcement has no superior, inasmuch as it knits the entire mass into an actual monolithic slab, weak at no point and so tied together that in case of accident from any cause whatever, no single section would fall but would be sustained by carrying capacity of wires running in continuous lengths over top of roof trusses or purlins

Inquiries Solicited

When in Need of—

Ornamental

Wire and Iron Work

SEND US YOUR ENQUIRIES

We specialize in

Jail and Prison Work

Canada Wire Goods Mfg. Co., Hamilton

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 1000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

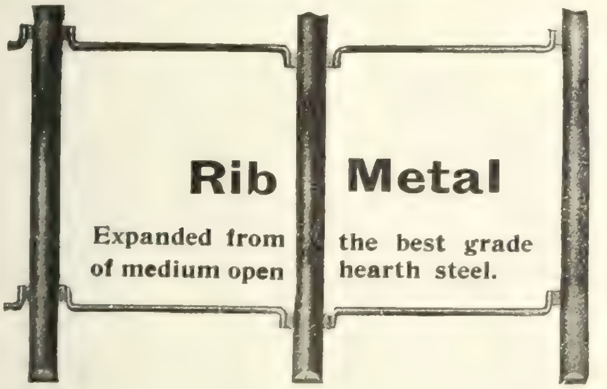
STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, TORONTO
G. W. ESSERY, Manager

KAHN SYSTEM

of Construction includes


Rib
Metal
Expanded from of medium open
the best grade hearth steel.

Supplied in sheets up to 18 ft. in length, width 16 in. to 5 ft. 4 in. For reinforcing concrete floors, roofs, walls, cisterns, etc.

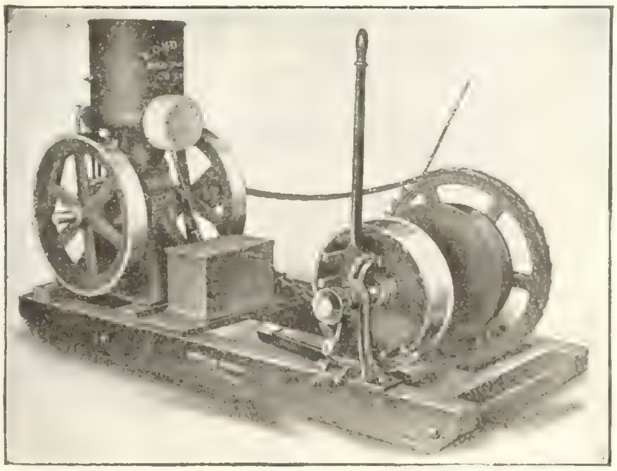
Other Products — **Kahn Truss Bars, Rib Bars. Hy-Rib, Trus-Con.** Chemical products for waterproofing and finishing concrete.

Trussed Concrete Steel Co.
of Canada, Limited

Head Offices and Works, Walkerville, Ont.

BRANCHES:
TORONTO—23 Jordan St.
MONTREAL—128 Coristine Bldg.
WINNIPEG—Union Bank Bldg.
VANCOUVER—52 Hutchinson Bldg.

DO YOU WANT A GOOD HOIST?



Patent Applied For

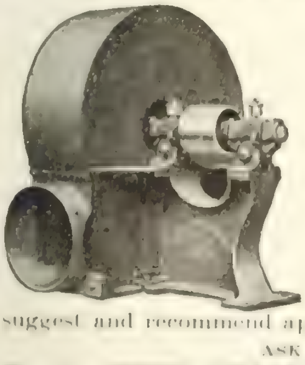
"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work **Mortar Conveying** **Well Digging**
Bridge Building **Sewer Building** **Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists **London, Canada**



Sturtevant

Stock Fans

Embrace such a diversity of types and sizes that nearly any ordinary conditions of fan engineering may be met by a fan shipped from stock.

Spare parts always ready for immediate shipment.

STURTEVANT Engineers suggest and recommend apparatus to meet requirements. ASK THEM. 863

B. F. STURTEVANT, Hyde Park, Mass.

Polson Iron Works Ltd., Toronto Eadie-Douglas Ltd., Montreal

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

Robert W. Hunt, President
Thos. C. Irving Jr., Vice-Pres.
Jas. W. [illegible], Secretary
Chas. Warnock, Treas. & Mgr.

Robert W. Hunt & Co. Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories, Canadian Express Bldg., Montreal, Que.
Branch Offices, Traders Bank Building, Toronto, Ont.
Norfolk House, Laurence Pountney Hill, London, E.C.

Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's New Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Perfection Wire Mesh

for concrete reinforcement is made from high carbon, cold drawn wire. The process of cold drawing eliminates the possibility of flaws. Perfection Wire Mesh is necessarily perfect.

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

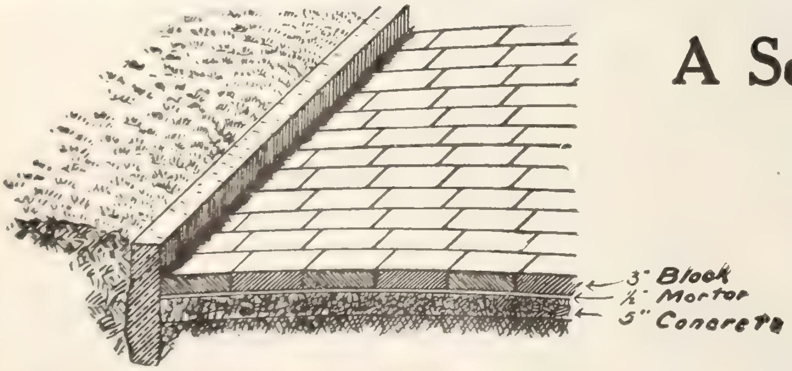
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

for Highest Efficiency, Absolute Reliability, Greatest Economy

Used by the Largest Mining Companies and Hydro-Electric Plants.
Also Extensively for Dredging, Exhaust Steam, Compressed Air, etc.

Sizes 3 to 42" Diameter up to ¼" in thickness
Easily installed and securely connected with our Forged Steel Flanges or All Steel Bolted Joints.

Write for our Catalogue 5-4 and prices on your requirement

AMERICAN SPIRAL PIPE WORKS — MAIN OFFICE CHICAGO
NEW YORK OFFICE—50 Church Street

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction. This bucket gave complete satisfaction.

(Extract from letter referring to above.) "Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."

W. S. Downing, (Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.
1032 Garfield Building, CLEVELAND, OHIO
SELLING AGENTS
The Dominion Equipment & Supply Co., Winnipeg, Canada

Strengthen Your Concrete

BY USING

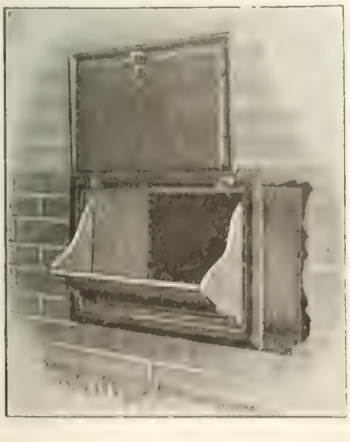
Guelph Hydrated Lime

The engineer who is dealing with concrete construction can greatly strengthen his job by using **Guelph Hydrated Lime.**

It makes the work Waterproof, and a better color.

Specify **Guelph Hydrated Lime** and insist on your dealer supplying it.

Standard White Lime Co.
Guelph, Ontario



EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 15 No. 3—33 x 22 x 18

Send for our illustrated booklet, [illegible] Coal Chutes

The Down Draft Furnace Co., Limited
Galt, Ontario, Can.

Montreal Representative: E. F. Dartnell, No. 8 Beaver Hall Square.
Gorman, Clancey & Grindley, Agents, Calgary and Edmonton, Alberta.

Save 75 cents a day on each Bricklayer

Possible with **Renfrew Lime** and you can lay 200 more bricks a day.

" Renfrew " will make more mortar per 100 lbs. of lime and it sets very hard.

Bricks are easily bedded down when " Renfrew " Lime is used.

Try it, and be convinced.

'Renfrew' the Lime of Quality

Jamieson Lime Co.

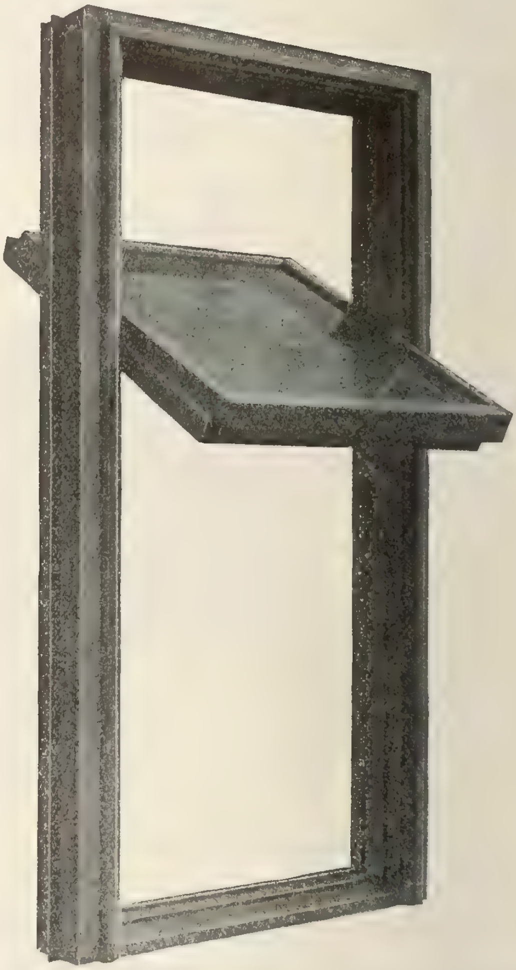
RENFREW, ONTARIO

White Lime - Stone - Grey Lime
Brick - Drain Tile

Reasons why

you should specify

DOUGLAS BROS.
FIREPROOF WINDOWS

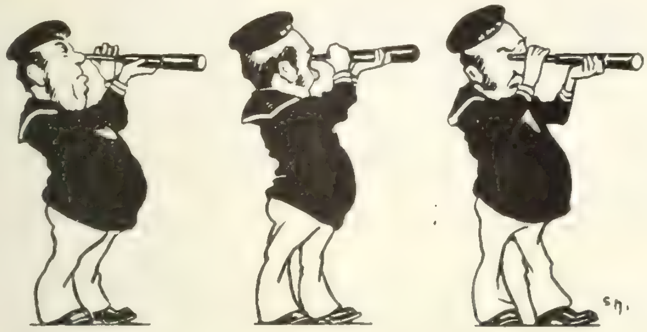


View of Double Hung Window

Easy to handle.
Mechanically perfect in construction.
Rigid and easily glazed.
Simply made and easily adjusted.
Made in a model factory by special machinery and skilled workmen.
And always delivered on time.
Other reasons will be found in our catalogue.

SEND FOR A COPY

Douglas Bros., Limited
Toronto, Ont. Montreal, Que.



Looking for Business

Then our DAILY REPORT SERVICE will help you. Our organization provides the only systematic method yet devised for reporting Building and Engineering projects from their inception to completion.

Special facilities for gathering news of sales opportunities in machinery, equipment and materials required.

Ask us for further information. Let us send you rates and specimen reports.

We Want Men

We require a man in every important town in Canada to report the progress of the building and engineering activities of his locality. We want men to tell us when machinery, equipment, supplies and materials are required—men who can report promptly and accurately news of all sales opportunities in these trades.

We report this information daily to our subscribers. This enables them to get in direct touch with the buyer.

There are one or two places where we are not represented. Perhaps it is your town. It will be worth your while to ask us.

MacLean Daily Reports

Head Office: 220 King St. West, Toronto. Branches: Vancouver, Winnipeg and Montreal

---

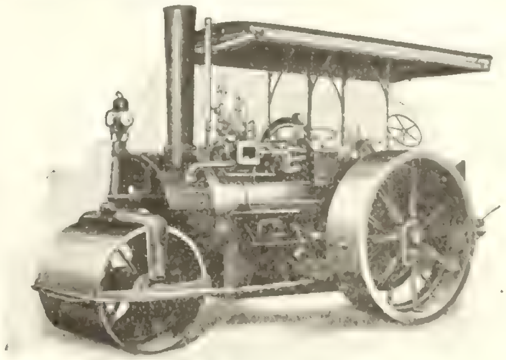
IRON STAIRS

Dennis Wire & Iron Works Co.

London, Canada Limited

Toronto Offices - 12 QUEEN STREET E.

"A Canadian Roller for Canadian Roads"



THE WATEROUS
DOUBLE CYLINDER
STEAM ROLLER

is built essentially to suit Canadian road building conditions. Over 100 Rollers in use in Canada to-day are proving their ability as road makers of the highest quality. A greater rolling capacity, with less cost of maintenance and operation, are its distinguishing characteristics. [illegible]

The Waterous Engine Works Co.

BRANTFORD, CANADA Limited

Agent: Hugh Cameron & Co., 72 Queen St. E., Toronto, Ont

Ritchie Contracting & Supply Co.,

Limited

7th Floor Bower Building, 543 Granville Street,
VANCOUVER, B.C.

Manufacturers and Dealers in Building Materials and Contractors' Supplies

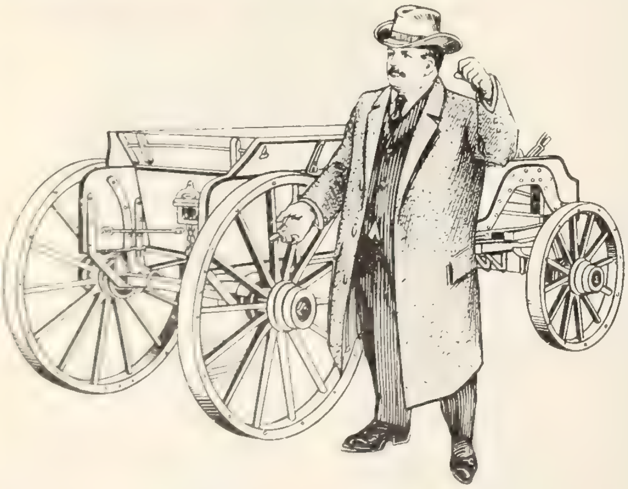
We carry in stock **Ransome Concrete Mixers** and parts.

AGENTS FOR :—**Hart-Ottis Convertable Cars**
Davenport Locomotives
McCully Rock Crushers
Marion Steam Shovels
The Dominion Wire Rope

Write, phone, or call for prices and catalogues.

Our aim, prompt delivery.

Jim Fellowes Talks :—



I wish you could see and hear about the line of marvelous "just-as-good" stuff that salesmen try to unload on the Watson Wagon Company.

Only the other day a salesman drifted in with a most astonishing substitute for linseed oil. He proudly referred to the fact that another builder of dump wagons was already using the substitute, and had contracted for his requirements a year in advance!

And substitutes for turpentine! The woods are full of them. Now, gentlemen, all these things cheapen manufacturing cost and they cheapen a wagon accordingly. There is no other excuse for their existence. In fact, no other excuse is offered.

Let me assure you that genuine turpentine and real linseed oil are still good enough for the Watson people to use, and that NO substitutes go into Watson paint.

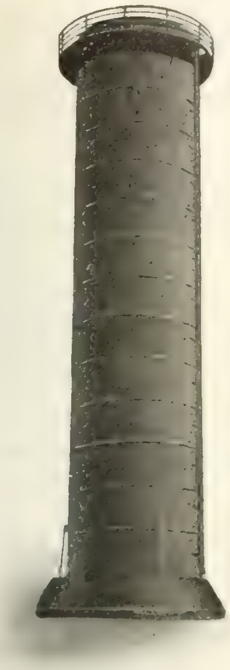
This is no small matter. The three coats of paint and a coat of varnish that stand between the wood and the weather, on a WATSON, are right. There is no adulteration and the paint goes on by hand, with a brush; no dipping. Think this over.

JIM FELLOWES, Canastota, N. Y.

Watson Wagon Company, Canastota, N.Y.

The First Builders of Bottom Dump Wagons

BRANCH OFFICES:
256 Broadway, New York, N.Y.
604 Witherspoon Bldg., Philadelphia, Pa.
806 Renshaw Bldg., Pittsburg, Pa.



STAND PIPES
and
Elevated Tanks

Highway Bridge and Concrete Work.

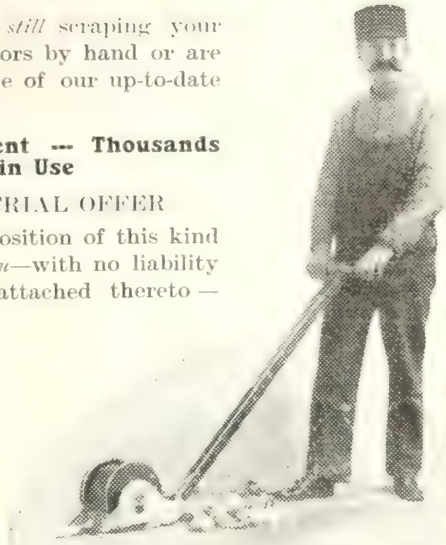
Boilers of all kinds.

Steel Piling.

Over a quarter of a century's experience in the manufacture of these lines.

Get our figures before closing your contracts

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.



The Contractor's "Money Saver"

Are you *still* scraping your hardwood floors by hand or are you using one of our up-to-date machines?

No Experiment --- Thousands in Use

FREE TRIAL OFFER

If a proposition of this kind appeals to *you*—with no liability or expense attached thereto—write us **to-day.**

MACHINE
PAYS FOR
ITSELF
IN A FEW
DAYS.

"Little Giant Floor Scraper"

Hurley Machine Co. Limited
Atlantic Avenue - Toronto

MODERN CONTRACTORS' PLANT
THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18" x 26" cylinder Mogul, Standard Gauge, and 18-10" x 14" Vulcan and Davenport dinkeys, 36" Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36" Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8" Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3 -Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Wagons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag-Scrapers an 1—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36" Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW
May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED
St. James St. and Dollard Lane - - MONTREAL, CANADA

Everything in Lumber for the Contractor

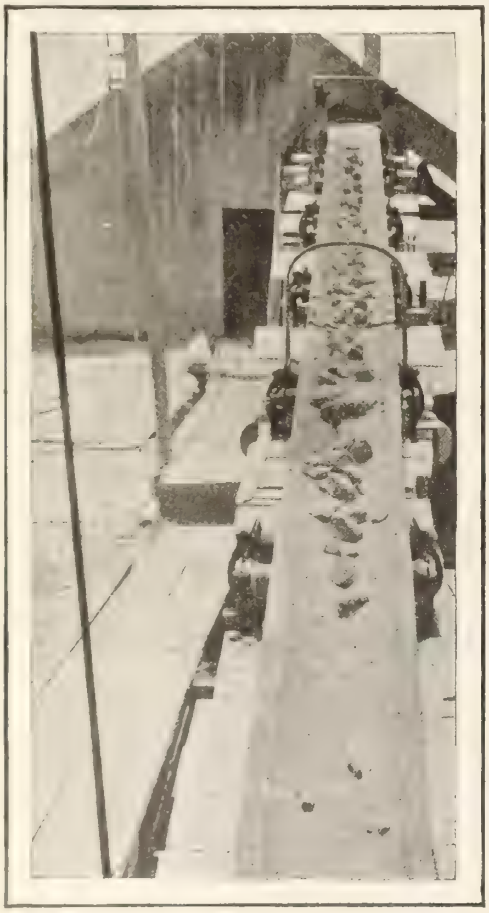
Fir, Hemlock, Spruce, Pine and Oak Timber and Lumber

We specialize in

Southern Pine Timber and Piles

10,000 Green Tamarac Piles for Immediate Shipment. Get our Prices.

THE ELMITT LUMBER CO. LIMITED, OTTAWA, ONT.



SCANDINAVIA
FEDERAL ENGINEERING & SUPPLIES LIMITED
TORONTO
BELTING

for Conveying Materials

Conditions may be WET or DRY

Federal Engineering & Supplies
Limited

Head Office, 284 Yonge Street, TORONTO
329 St. James Street, MONTREAL

THE
Thames Quarry Co.
St. Mary's, Ont.

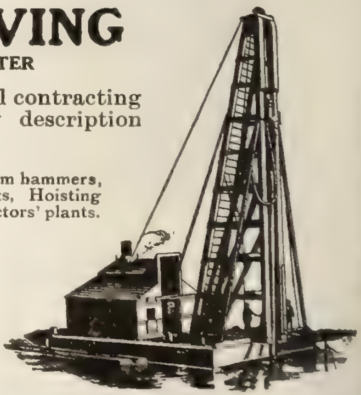
CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.



Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.

The

Missisquoi Marble Company
Limited

Canada's Pioneer and Leading Concern in the Marble Business

They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd.	Toronto, Ont.
C. N. Barclay	Winnipeg Man.
Bosse & Banks	Quebec, Que.
General Contractors Supply Company, Ltd.	Halifax, N. S.
129 Sparks Street	Ottawa, Ont.
James Robertson Co. Ltd.	St. John, N. B.
G. R. Duncan	Fort William, Ont.
Walker & Barnes	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd.	Vancouver, B. C.
315 Coristine Building	Montreal, Que.

Everlasting Building Brick

GLENBOIG

Every Glenboig Brick bears the brand

GARTCOSH

GLENBOIG

Manufactured from the natural product without any sand. This makes a hard brick proof against destruction by time, tempest or climate changes.

Specify "GLENBOIG" on your next job

MAKER'S SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another.

Tide Water Iron Works

HOBOKEN, N.J. U.S.A.

Builders' Supplies

Mouldings
Turnings
"Empire Brand"
Hardwood Flooring
Stair Building
Interior Trim
Sash
Veneered Doors
Pine Doors

J. R. Eaton & Sons
Limited
Orillia, Ontario

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 604 / 605 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C. P. R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

MARSH GAUGES

FOR ALL PRESSURES AND PURPOSES

THE STANDARD FOR ALMOST HALF A CENTURY

PROMPT SHIPMENTS

WRITE FOR OUR PRICES
Gauge and Air Valve Catalogues

Jas. P. Marsh & Co., 224 Washington St. CHICAGO, ILL.
Established 1865

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches.......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES

(Installed in Toronto).

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite, 55 cents per square foot.

Viterous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 4 compression bath cock ....net	$1.65
No. 4½ Fuller's ....net	2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

PAINTS AND OILS

(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, 8cc per gallon.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Brown sills and heads, in the rough, delivered, 40 cents per foot.

Rubble stone in car lots, $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds, delivered f.o.b. Toronto.

Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.

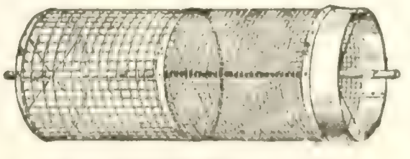
Lime, per cwt., delivered, 38 cents.

Plaster of Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

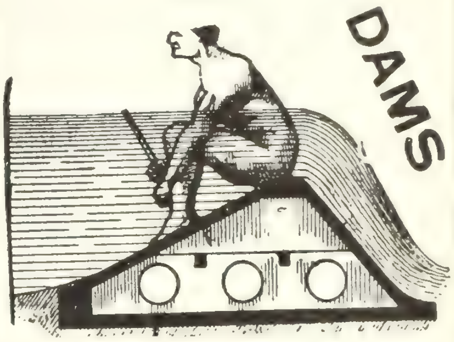
H. J. GLAUBITZ, C.E.
Consulting Engineer
Electric, Hydraulic, Steam Engineering
Blast Furnace and Mill Practice
Structural Work
1103 TEMPLE BLDG., TORONTO

We manufacture
Revolving Screens



and anything in the screen line.
Also railings, wire guards, grills etc.
Electro-plating and all metal finishes.
Estimates Given Send for Catalogue
Crescent Wire & Iron Works
Partridge & Sons KINGSTON

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
Office and Works:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

DOMINION BRIDGE CO.
LIMITED

WE BUILD
BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF
Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co. Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter
River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS and CONTRACTORS

Water Washed Sand
Crushed Granite
Crushed Lime Stone

Prompt Attention Given Orders

Our Dock Spadina Ave.
PHONES
Office - Adel. 1947
Yard - Adel. 1948

SAND & SUPPLIES, LIMITED
TORONTO

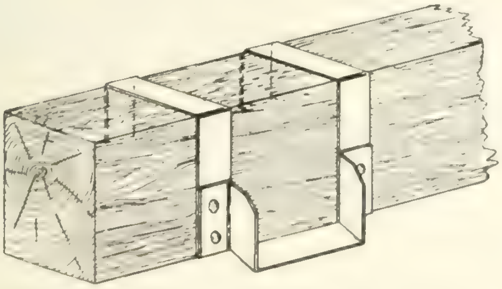
The
Phœnix Bridge & Iron Works Limited
MONTREAL
General Steel Contractors
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

Portland Cement

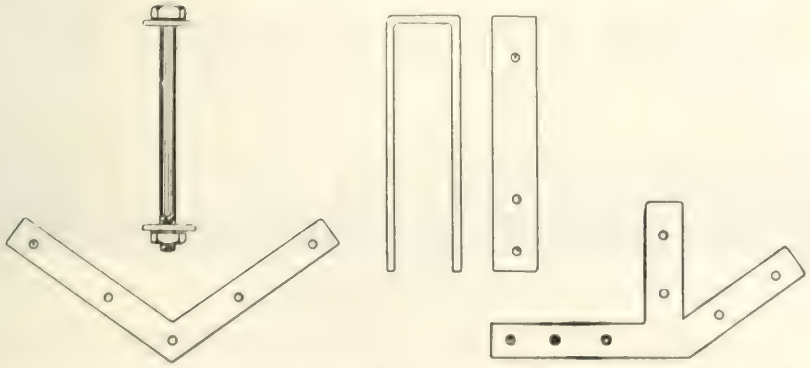
High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company, Ltd.
HAMILTON, ONT.



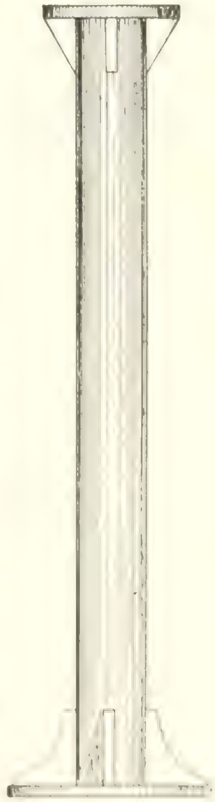
STEEL JOIST HANGERS, Single or Double



IRON FORGINGS, for Wooden Trusses, Apex Straps, Stirrups, Bolts and Rods made to order

Beams,
Angles,
Channels,
Plates,

All Size from 1½ inch to 24 inches, and any length up to 70 feet.



CAST IRON COLUMNS
all sizes and designs

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

JAMES THOMSON, President. J. G. ALLAN Vice-President. JAMES A. THOMSON, Secretary.

THE CARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The Roofers Supply Co. Limited

- Roofing Slate
- Red Slate
- Green Slate
- Mottled Slate
- Black Slate
- Blackboards Slate
- Structural and Electrical Slate
- Terra Cotta Tiles
- Asphalt
- Pitch
- Tar
- Asbestos Sheathing
- Building Papers
- Tarred Felts
- Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

- Glass Wired and Rough Rolled
- Galvanized Sheets
- Black Sheet
- Copper Sheet
- Tinplates
- Canada Plate
- Zinc Sheets
- Corrugated Iron
- Gutters
- Pipes
- Elbows
- Spikes
- Nails
- Slater's Tools, Etc.

ROCALITE

The Ready Mixed

Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

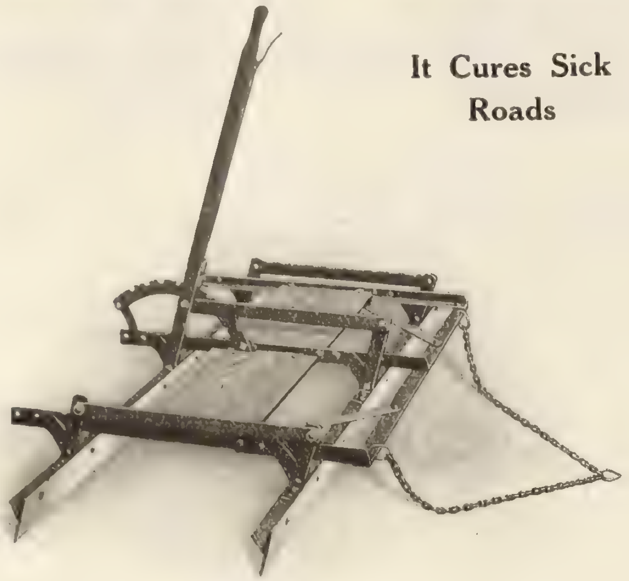
CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridge's Bay, TORONTO

Abrico Road Drag No. 1



It Cures Sick Roads

Patented April 28, 1908

Length 8 feet. Width between blades 30 inches. Blades 6 inches. Weight 300 pounds.

Do you want nice smooth roads?

This Drag will take out all of the **bumps** and fill up all the **ruts.**

It is of steel construction and is adjustable, both forward and backward, and can be operated by one man and team.

Do not let distance keep you from having one.

Your order by mail will be given careful attention.

Manufactured by

Attica Bridge Company

Attica, Indiana, U. S. A.

Canadian Representatives desired. Write for special terms.

HERCULES

Waterproofing and Strengthening Compound

A Practical, Efficient, Economical and Everlasting Material for Waterproofing and Strengthening Concrete (or Cement)

Absolute Impermeability

Increases Density Increases Strength

Hercules Waterproofing Compound

To be mixed with ordinary cement, a fine ground powder, which when mixed with the cement before the addition of the sand and water, not only renders the concrete waterproof, but increases its strength from 20 to 35 per cent.

Hercules Liquid Waterproofing

A thin, colorless liquid to be applied on set concrete with a brush, two coats being sufficient to render the concrete absolutely waterproof. One gallon covering about 150 square feet.

DISTRIBUTORS:

Toronto—Ontario Lime Association, Ltd.
Ottawa—D. J. MacKenzie.
Welland—David Dick & Sons.
Niagara Falls—W. E. Thomas.
Montreal—Alexander Bremner, Ltd.
Hamilton—Drake & Avery.
St. Catharines—Wilson Lumber Co.

The Hercules Waterproof Cement Company

BUFFALO, N. Y., U. S. A.

The Des Moines Hemispherical Bottom Steel Tanks and Towers

have been used and approved by nearly all leading Engineers. They are undoubtedly the most economical means of storing water at an elevation.

We have built many of these in Canada the United States and Mexico.

Estimates cheerfully furnished.

Send for Catalog No. 15

Des Moines Bridge & Iron Co.

Pittsburg, Pa., U.S.A., 945 Curry Bldg.
Des Moines, Iowa, U.S.A. 938 Tuttle St.

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A

JAS. DICKSON, Pres. GEO. T. DICKSON, Vice-Pres.

Dickson Bridge Works Co.
Campbellford, Ont. Limited

Bridge over Spanish River at Massey, Ont.

Steel Bridges, Steel Buildings Roof Trusses

and other Structural Steel

Foundry and Machine Shop in connection.

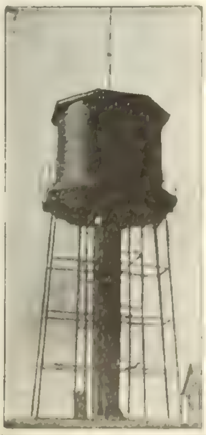
Estimates on application

This Space has been Reserved by

National Bridge Co. of Canada, Ltd.

J. N. Greenshields, President.
H. W. Beauclerk, Treasurer.
Wm. Lyall, Vice-President.
J. L. Brown, C.E., Gen. Mgr.

Works and Head Office:
MONTREAL, QUE.



Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Tenders

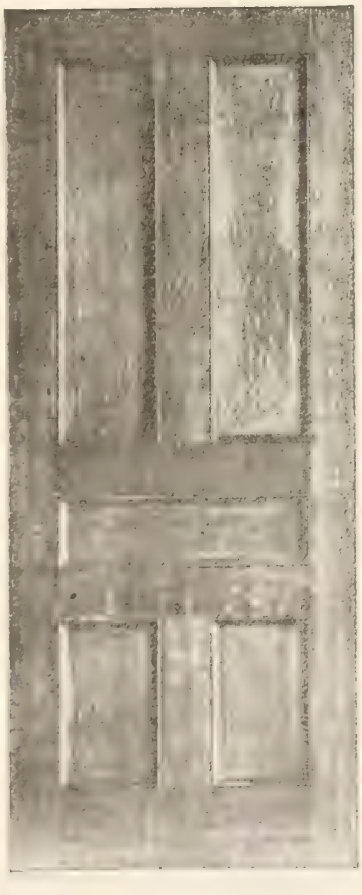
A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

The above cut shows building built by us last year for the Ford Motor Co. of Canada, Walkerville, Ont. We have just been awarded the contract for two more buildings for the same firm. One building, 75 x 200 ft., four stories and the second building, 40 x 110 ft., two stories.

WELLS & GRAY, Limited, Engineers and Contractors, **Toronto**



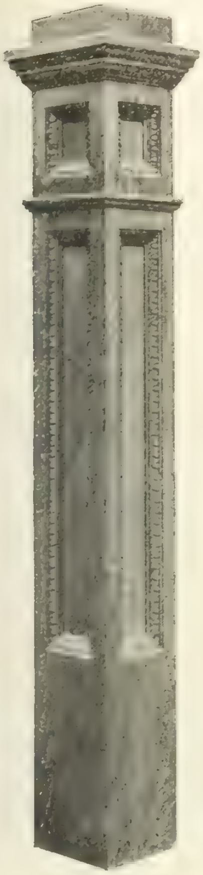
Doors Sash
Frames
House Trim

Midland Brand

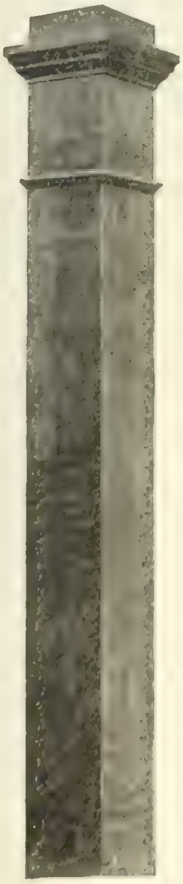
All manufactured in our new and up-to-date factory with latest and best machinery. A knowledge of the requirements of contractors and architects demanding high grade material has enabled us to market interior finish that CAN'T BE BEATEN.

Georgian Bay Shook Mills, Limited

MIDLAND, ONTARIO



Newel Post
No. B.L. 206



Newel Post
No B.L. 203

BATTS

Limited

FOR

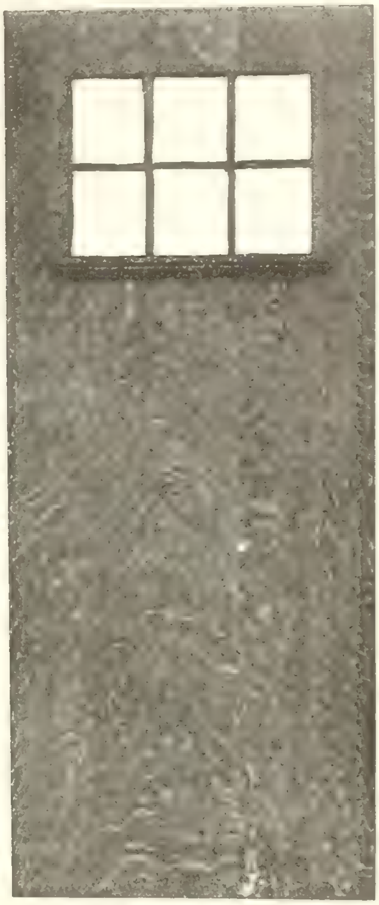
Columns
Newel Posts
Doors
House Trim
Sash

With our immense column department containing over 10,000 square feet of floor space and equipped with up to date machinery we are able to handle your orders promptly and properly. Our doors do not warp, sag or check.

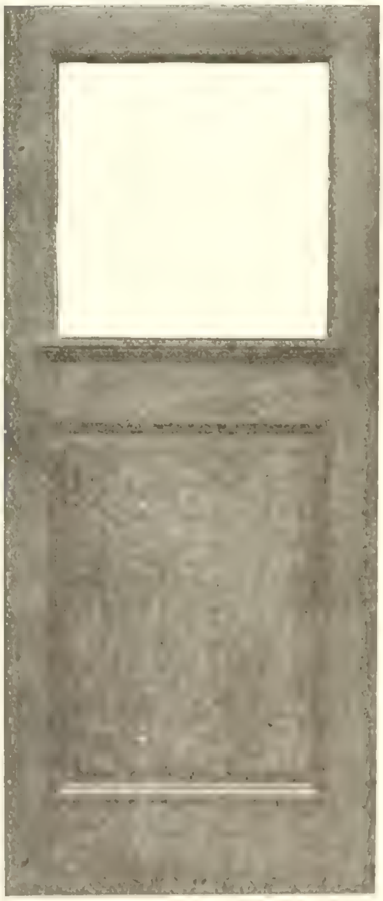
We have a catalogue for you

Batts Limited

374 Pacific Ave., West Toronto



Door No. B L 312



Door No. B. L. 310

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO WINNIPEG

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING

Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

CONSULTING ENGINEER

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street East, MONTREAL

John. T. Farmer

MECHANICAL AND HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT · ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.

A. M. Can. Soc. C. E. A. M. Am. Soc. C. E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.

Suite 413, Pacific Block, Vancouver, B. C.

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { Waterworks, Sewerage and Electric Lighting.

Winnipeg and Calgary

John Haddin E. L. Miles

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

Allan Keefer

Architect

Ottawa, Ontario

Arthur L. Weeks

Architect

Canada Life Building, Ottawa

Reinforced concrete and steel structures. factories and commercial buildings

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

The

Laurentian Granite Co.

Limited

MANUFACTURERS OF

Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St. **Montreal**

Bell Tel. M. 4354

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Bonds of Suretyship

for Officers and Employees in positions of trust.

Bonds Bid and Supply

in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies.

The Guarrantee Company of North America

The Pioneer Company. *Established 1872*

Head Office - Montreal

Capital and Resources over - $2,000,000
Claims Paid over - - - $2 300,000

NO CLAIMS IN DISPUTE

This Company is not a party to any premium tariff combination.

THE FOUNDATION COMPANY

LIMITED

Bank of Ottawa Building - Montreal, Canada

RECENT CONTRACT

C. P. R. St. Lawrence River Bridge

13 Existing River Peers, 2 Land Peers and 2 Abutments, all extended to twice their present length. Also 4 New River Piers.

Our Scope

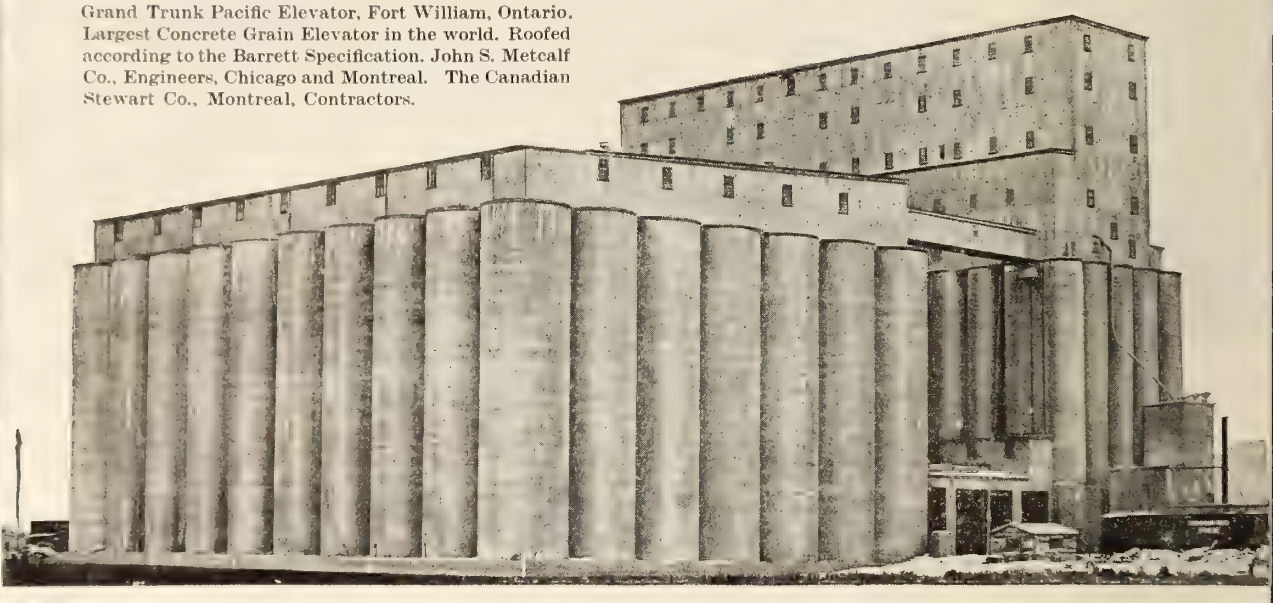
- Bridge Piers
- Mining Shafts
- Tunnels
- Water Power Construction
- Power Plants
- Sea Walls
- Wharves Quays,
- Dams
- Lighthouses
- Heavy Building Foundations

Our Methods

- Pneumatic Caissons
- Open Caissons
- Wooden and Steel Sheet Piling
- Concrete Piles
- Wooden Piles
- Coffer Dams
- Concrete Steel Construction

We Invite Inquiries in Reference to Cost and Design of Difficult Foundation Work.

Barrett Specification Roofs



Grand Trunk Pacific Elevator, Fort William, Ontario. Largest Concrete Grain Elevator in the world. Roofed according to the Barrett Specification. John S. Metcalf Co., Engineers, Chicago and Montreal. The Canadian Stewart Co., Montreal, Contractors.

Largest Concrete Grain Elevator in the World

THE accompanying illustration shows *the largest concrete grain elevator in the world.*

It has a capacity of 2,500,000 bushels, and is part of a plant which, when completed, will be capable of storing one-third the wheat crop of Western Canada. This section cost $1,250,000. Its roof area 75,000 square feet, is covered with a Barrett Specification Roof.

The reasons for this choice of roofing were:

First—*Low Maintenance Expense.* As a Barrett Specification Roof never needs painting and will last 20 to 30 years, the maintenance expense may be said to be nothing.

Second—*Low Unit Cost.* For a roofing, the unit cost is the cost per square foot per year of service. Dividing the cost of a Barrett Specification Roof over, say 20 years (its probable life), gives the very low unit cost of about ¼c. per foot per year. This is far below that of any other type of roofing known.

The foregoing reasons explain the enormous popularity of Barrett Specification Roofs on permanent structures of all kinds.

Copy of the Barrett Specification on request. Address nearest office.

The Paterson Manufacturing Co., Limited

Montreal Toronto Winnipeg Vancouver, St. John N.B. Halifax, N.S.

Canada Wire & Cable Co., Ltd.

Announce the Opening of their New

Wire, Cable, and Wire Rope Works

at Toronto

The Product of our Electrical Wire Department will include

Electrical Wires and Cables

in Aluminum and Copper

BARE AND INSULATED—FOR ALL PURPOSES.
GALVANIZED IRON TELEGRAPH AND TELEPHONE WIRE

The Product of our Wire Rope Department will include:

- Standard Hoisting Ropes
- Semi-Pliable, Pliable and Extra Pliable Ropes
- Improved Patented Crucible Cast Steel Hoisting Ropes
- Improved Mild Steel (Siemens-Martin) Elevator Ropes
- Transmission and Colliery Ropes
- Tiller Ropes
- Galvanized Steel Hausers
- Galvanized Strand—2, 3 and 7 wire for Guys
- Ropes to any Standard Specification

Literature ready for distribution at an early date. Write for it

CANADA WIRE & CABLE CO.

LIMITED

Factory at
1160-70 Dundas Street
Toronto

HEAD OFFICE
KENT BUILDING, 156 YONGE STREET,
TORONTO

Wheel Barrows

For Every Purpose

We carry a complete stock of "Kilbourne & Jacobs" Barrows, suitable for every requirement. These barrows will out-wear any other make and once you install "K and J" Barrows on your work you will use no other make. They cost no more and when you purchase barrows—you might just as well get the very best. We have a special Barrow Catalogue, which illustrates and describes fully every imaginable style of wheelbarrow—we want you to have a copy—it will surely come in useful—perhaps not now at the monent—but some day.

If you need barrows for your present work—tell us your requirements—we may be able to suggest a type of barrow which will be just what you always wished for. We have so many different styles—Barrows for

Concrete Stone Sand Earth Ashes
Mortar Brick Sawdust Coal
Coke Metals, Etc., Etc.

Drop Us a Line for Copy of Catalogue 30

F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.
GORMAN, CLANCEY & GRINDLEY, LTD., Calgary and Edmonton Agents

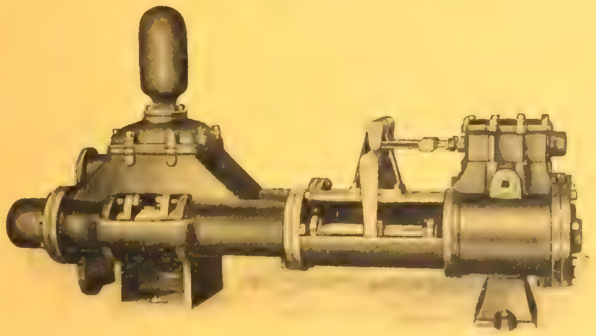
Vol. 25 Toronto, August 16, 1911 No. 33

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

We manufacture Steam and Power Pumps, Condensers, Travelling Cranes, Etc.



Write for Catalogue

The Smart-Turner Machine Company
HAMILTON, ONTARIO Limited

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: 91 to 133 Don Roadway
TORONTO

SANDERSON'S

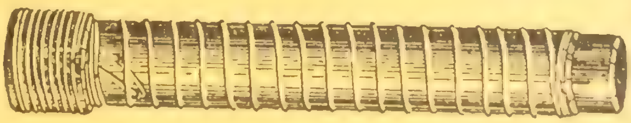
CAST STEEL

"Canada Crown"
"Crucible Tool"
"Superior"
"Extra"

"Special"
"Double Special"
"Self Hardening"
"Rex" High Speed"

All Good Grades at Lowest Prices

A. C. Leslie & Co., Limited
Montreal
Canadian Sales Agents



Continuous and Machine Banded Wood Stave

WATER PIPE

RESERVOIR TANKS

for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

---

THE "AMERICAN" IS THE PROPER MACHINERY FOR HANDLING SAND

The equipment shown in the illustration, consisting of

An "**American**" Stiff Leg Derrick, a Double Drum Belt Hoist and a Three-quarter Yard Clam Shell Bucket, is handling from **sixty to eighty yards of sand per hour.**

The contractors have been piling up profits with this machinery for two years and it's as good as new to-day,

If you wish to write the owners, we will furnish their names.

Name

Address

Please send information and prices on Derrick for Handling Sand.

AMERICAN HOIST
& DERRICK CO.
St. Paul, Minn.
C R 8-[illegible]

American Hoist & Derrick Company

St. Paul, U.S.A.

Gorman, Clancey & Grindley, Edmonton, and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot. Ltd., Vancouver, B.C.
The Stuart Machinery Co. Ltd., Winnipeg, Man.

More and more frequently Canada Cement is being named in specifications because Builders and Architects keep these facts in mind

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

CANADA CEMENT COMPANY LIMITED
PORTLAND
CANADA
CEMENT
MONTREAL

Canada Cement Company, Ltd.

MONTREAL - TORONTO - WINNIPEG - CALGARY

SQUEEGEE

COMBINED

Sprinkler and Sweepe

Send for Particulars of This Mos Up-to-date Machine

20 Fillings of Tank will Clean 40,000 Square Yards of Asphalt or any Smooth Pavement.

Rubber Squeegees good for 450 to 500 Working Days. :: :: :: ::

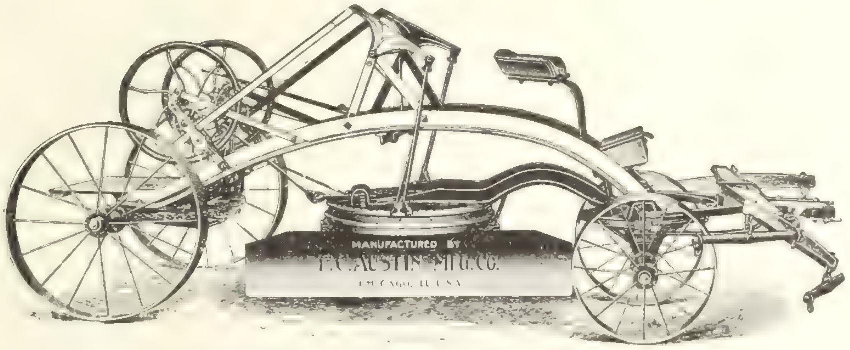
Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

Road Machinery

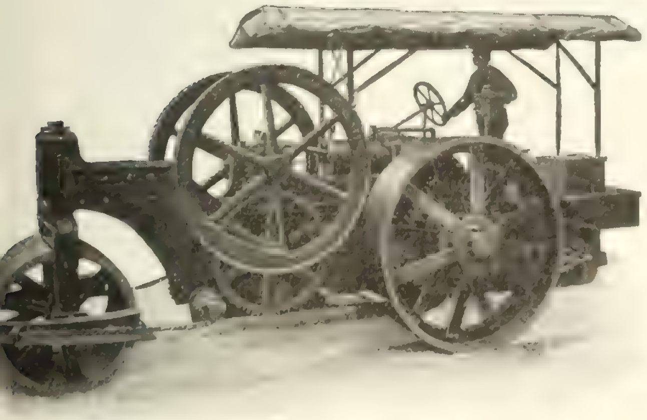
of All Kinds

raders
Sweepers
Sprinklers
Scrapers
Ploughs



AUSTIN ROAD GRADER

team and Motor Road Rollers



AUSTIN MOTOR ROAD ROLLER

Send for
CATALOGUE 29
on
MUNICIPAL SUPPLIES

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Architects

Page

Keele, Alan 92

Weeks, Arthur I. 92

Architectural Iron Work

Canada Wire Goods Mfg. Co. 82

Dennis Wire & Iron Works 77

Meadows Co., Geo. B. 33

Air Compressors

Escher Wyss & Co

Asphalt Plant

East Iron Machine Co. 73

Buckets

American Hoist & Derrick Co. 2

Sackett Screen & Shute Co. 94

Belting

Federal Engineering & Supplies, Ltd 80

Brick Chimneys

Heinicke, H. R.

Blowers

Sturtevant Co., B. F. 71

Boilers

Inglis, John 67

Jenckes Machine Co. 2

Leonard & Sons, E. 73

Marsh & Henthorn 71

McDougall Caledonian Iron Works 69

Mussens Limited 4

Waterous Engine Works Co. 77

Brick Machinery and Supplies

Berg Mfg. Co.

Wert C. S. 10

Whitehead, John 68

Brick

American Enamelled Brick Co.

Don Valley Brick Works 7

Hamilton Pressed Brick Co.

Milton Pressed Brick Co 90

Port Credit Pressed Brick Co. 86

Toronto Pressed Brick Co. 18

Brickmaker's Supplies

Sackett Screen & Shute Co. 94

Bridges (Steel)

Attica Bridge Co. 88

Canadian Bridge Co. 84

Cleveland Bridge Co. 84

Des Moines Bridge and Iron Co. 72

Dickson Bridge Works

Dominion Bridge Co. 84

Hunter Bridge and Boiler Works 79

National Bridge Co. 89

Phoenix Bridge and Iron Works 85

Pennsylvania Steel Co. 84

Cement

Alsen Portland Cement Co 74

Britnell & Co 80

Bremner, Alex 87

Canada Cement Co 3

McNally & Co., W. 85

Morrison & Co., T.A. 92

Rogers, Alfred Limited 9

Concrete Pipe

Dominion Concrete Co. 22

Lock Joint Pipe Co. 17

Cement Waterproofing

Ceresit Waterproofing Co.

Chillas-Black 19

Hercules Waterproofing Cement Co

Mansbendel, F. P. 31

Cranes, Travelling & Locomotive

Page

American Hoist & Derrick Co. 2

Armstrong, H. J.

Brown Hoisting Machinery Co. 79

Males Co 64

Parker, S. E 20

Willis Shaw Machinery Co 64

Conduits

Conduits Co., Limited 87

Crushed Stone and Granite

Sand and Supplies 85

Concrete Mixers and Machinery

Canada Foundry Co 20

Chain Belt Co 88

General Machinery Co.

Gould, Shapley & Muir 16

Hopkins & Co., F. H. 96

Ideal Concrete Machinery Co.

Jenckes Machine Co 2

London Concrete Machinery Co. 33

Milwaukee Mixer Co. 16

Mussens Limited 4

Morrison & Co., T.A. 92

Municipal Engineering & Contracting 70

Richert Mfg. Co. 25

Steel and Radiation (Cement Gun) 23

Standard Scale 94

Vining Bros. 30

Wettlaufer Bros. 30

Wert C. S. 1

Contractors' Plant

American Hoist & Derrick Co. 2

Acme Eqpt. & Engineering Co. 75

Beatty & Sons, M. 6

Hepburn, John T. 12

H. & E. Lifting Jack Co.

Hopkins & Co., F.H. 96

International Marine Signal Co. 8

Willis Shaw Machinery Co. 64

Marsh & Henthorn 71

Montreal Locomotive Works 32

Mussens Limited 4

Parker, S. E 20

Richert Mfg. Co. 25

Ritchie Contractors Supply Co.

Tiffin Wagon Co.

Troy Wagon Works 89

Watson Wagon Co.

Wert C. S. 10

Crushers (Stone and Rock)

Berg Machinery Co

Hopkins & Co., F. H. 96

Jenckes Machine Co 2

London Concrete Machinery Co. 33

Males Co 64

Mussens Limited 4

Morrison & Co., T. A. 92

Willis Shaw Machinery Co. 64

Corrugated Iron

Galt Art Metal Co 88

Metallic Roofing Co 71

Metal Shingle and Siding Co.

Ormsby, A. B., Limited 11

Roofers Supply Co 87

Contractors

Bennett, Robt. 72

Foundation Co

Holmes, Fred.

McIlwraith, Jas. A. 83

Nadel & Adler 92

Wells & Gray

Coal Handling Apparatus

American Hoist & Derrick Co. 2

Down Draft Furnace Co. 75

Parker, S. E 20

Derricks and Derrick Fittings

Page

American Hoist & Derrick Co. 20

Parker, S. E 20

Drills

Beatty & Sons M 6

Canadian Rand Co

Drilling Contractors

Harvey, J 83

Dredges

Beatty & Sons, M 6

Males Co 64

Willis Shaw Machinery Co 64

Dry Kilns

Sturtevant Co., B. F. 71

Electrical Apparatus, Motors

Canada Ford Co. 34

Engines

Canadian Boving Co. 73

Inglis, John 67

Jenckes Machine Co 2

Leonard & Sons, E 73

Mussens Limited 4

Sturtevant Co., B. F. 71

Waterous Engine Works Co. 77

Engineers (Civil) and Mechanical

Barber & Young 92

Chipman & Power 92

Bowman & Connor 92

Farmer, John T. 92

Fuce, Edw. O. 92

Galt Engineering Co., John 92

Hancock, H. Syd. 92

Inglis, John 67

Kennedy, Jas. C. 92

Lea & Ferguson 92

Mace, T. Harry 92

Mitchell, C. H. 92

McRae, John B. 92

Moore & Scollan 92

Taylor, James 92

Exhaust Heads

Sturtevant Co., B. F. 71

Filters

American Water Softener Co. 90

Floor Surfacers

Schleuter, M. T.

Friction Clutches

Berg Machinery Co

Field Instruments

Consolidated Optical Co

Gurley, W. & L. E. 70

Fire Brick

Gibb, Alexander 81

Fire Apparatus

Morrison & Co T. A. 92

Seagrave, W E. 80

Fireproof Doors and Windows

Douglas Bros 76

Mussens Limited 4

Ormsby, A. B. 11

Steel and Radiation 23

Granite and Marble

Laurentian Granite Co. 83

Missisquoi Marble Co. 81

Smith Marble & Construction Co. 76

Glass

Page

Consolidated Plate Glass Co. 86

Hobbs, Mfg. Co. 72

Luxfer Prism Co. 93

Toronto Plate Glass Importing Co. 1-30

Hoists (Hand Gasoline and Electric)

Parker, S. E. 20

Heating Apparatus

Jenckes Machine Co. 2

Leonard & Sons, E. 73

Steel and Radiation 23

Hoisting Machinery

American Hoist & Derrick Co. 2

Beatty & Sons, M. 6

Canada Ford Co. 34

Inglis, John 67

Jenckes Machine Co 2

Hopkins & Co., F. H. 96

London Gas Power Co. 71

Marsh & Henthorn 71

Mussens Limited 4

Parker, S. E. 20

Sturtevant Co., B F. 71

High Pressure Pipe Lines

Escher Wyss & Co

Hydrants

Canada Iron Corporation 87

Gartshore-Thomson Pipe Co. 86

Kerr Engine Co. 91

Interior Finish and Doors

Anglin, S. 74

Brennen & Sons, M. 94

Batts Limited

Canada Office & School Furniture Co

DeLaplante, Ltd. 81

Bryan Mfg. Co. 70

Eaton & Sons, J. R. 81

Elmitt Lumber Co. 80

Georgian Bay Shook Mills 92

Rhodes Curry & Co. 88

Wilson Bros. 26

Locomotives

Montreal Locomotive Works 32

Metal Form for Concrete

Reichert Mfg. Co. 25

Lime

Christie, Henderson & Co. 82

Jamieson Lime Co. 76

Ontario Lime Association

Standard White Lime Co 75

Metal Lath

Galt Art Metal 88

Metallic Roofing Co. 71

Noble C. W. 74

Steel and Radiation 23

Meters

Hopkins & Co., F. H. 96

McDougall Caledonian Iron Works 69

Neptune Meter Co. 25

Paving and Paving Materials

Dominion Carbolineum Works 14

Metropolitan Paving Brick Co. 72

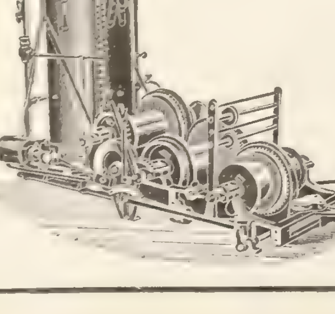
Ontario Asphalt Block Co. 74

Shawmut Paving Brick Co. 72

Silica Barytic Stone Co. of Ontario 83

(Continued on page 10)

M. Beatty & Sons, Limited **Welland, Ontario, Canada**



Dredges - Ditchers - Derricks

Steam Shovels

Steel Dump and Deck Scows

Submarine Rock Drilling Machinery

Mine Hoists, Hoisting Engines

Centrifugal Pumps, Clam Buckets

Steel Skips, Coal and Concrete Tubs

and other Contractors' Machinery

Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Engineers and Builders

OF ALL

Steel and Iron Structures

Mill Buildings our Specialty. Roofs, Bridges, Columns and Girders of Every Description. Large Stock of Structural Shapes always on hand for immediate shipment. Ask for Designs and Estimates on your Work.

International Marine Signal Company Limited
OTTAWA, CANADA

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.
WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster
Page

Albert Mfg. Co...
Britnell & Co 82
Calkins, H. W. .. 80

Portable Saw

Canadian Fairbanks 27

Pipe

American Spiral Pipe Works 75
Canadian Pipe Co 80
Dominion Wood Pipe Co..... 12
Dominion Concrete Co. 22
Gartshore-Thomson Pipe Co. 86
Lock Joint Pipe Co 17
Manderich & Co 11
National Iron Works 87
Pacific Coast Pipe Co.......... ... 1
Pedlar People..................
Steel Co. of Canada.................. 19
Steel and Radiation.................. 23

Plumbers' Supplies

Standard Ideal Co. 34

Power Engines

Inglis Co., John........ 67

Paints and Varnishes

Paterson Mfg. Co............ ......

Pile Driving Machinery

American Hoist & Derrick Co... ... 2
Lincoln Construction Co..... 80

Pumps and Pumping Machinery

American Well Works............ 24
Beatty & Sons, M........... 6
Cook, A. D........................ 30
Escher Wyss & Co.................
Hopkins & Co., F. H. 96
Inglis Co , John.............. 67
Leonard & Sons, E 73
McDougall Caledonian Iron Works.. 69
Mussens Limited........ 4
Ontario Wind Engine & Pump Co 72
Smart-Turner Machine Co. 1
Waterous Engine Works Co 77

Roofing Materials
Page

Asbestos Mfg Co............ 27
Galt Art Metal Co. 88
Metallic Roofing Co.............. 71
Metal Shingle & Siding Co. ....
Noble, Clarence W 74
Paterson Mfg. Co. ....
Philip Carey Co.................... 71
Roofers Supply Co............ 87
Standard Paint Co............. ..

Railway Supplies

Gartshore, John J..... 92
Hopkins & Co., F. H..... 96
Mussens Limited...... 4

Reinforcements. Concrete and Steel

Ambursen Hydraulic Construct'n Co. 83
Canada Wire Goods Mfg. Co...... 82
Steel Co. of Canada.... 19
Steel & Radiation.... 23
Trussed Concrete Steel Co........ 78
Turner, C. A. P....... 26

Road Machinery

Hamilton Machinery Co. 15
Morrison & Co., T. A 92
Mussens Limited. 4
Western Wheeled Scraper Co....... 11

Shovels (Steam)

Beatty & Sons, M........ 6
Canada Foundry Co.... 20
Hopkins & Co., F. H......... 96
Montreal Locomotive Works...... 32
Mussens Limited.. 4
Males Co........ 64
Willis Shaw Machinery Co........ 64

Stone

Anderson, Geo 18
Britnell & Co............. 82
Brodie, Jas.........................
Christie, Henderson & Co. 82
Consolidated Stone Co.... 90
Contractors' Supply Co.... 82
Corinthian Stone Co.... ....
Crushed Stone, Limited...... 73
Doolittle & Wilcox....... 87
Hagersville Contracting Co.. 11
Laurentian Granite Co...... 83
McMillan & Son, R................ 70
Morrison & Co., T. A.... 92

Stone
Page

Myers, Oakley............ 73
Roman Stone Co 13
Sackville Freestone Co. 8
Sand & Supplies................... 85
Thames Quarry Co.................. 80

Sand and Gravel

Rogers Supply Co................ 31
Sand & Supplies 85

Steam Apparatus

Sturtevant Co , B. F............... 71

Submarine Diver

Rouleau, Joseph N. 92

Structural Iron and Steel

Dominion Bridge Co........... 84
Franklin Steel & Iron Co.. 29
Steel Co. of Canada 19
Pennsylvania Steel Co.......... 84
Phoenix Bridge & Iron Works 85
Reid & Brown.... 83
Salter, W. H............... 85
Steel & Radiation.................. 23

Sewer Pipe

Britnell & Co 82
Canada Iron Corporation.... 86
Dominion Sewer Pipe Co..... 21
Gartshore Thomson Pipe Co.. 86
Hamilton & Toronto Sewer Pipe Co. 20
Lock Joint Pipe Co. 17
National Iron Works 87
Ontario Sewer Pipe Co.... 21
Standard Drain Pipe Co..... 21

Slate

Roofers Supply Co........... 87

Steel Shingles and Ceilings

Galt Art Metal Co................. 88

Smoke Stacks

Leonard & Son, E...... 73

Safes and Vaults

Taylor, J & J 94

Tents

Woods Limited..................... 25

Page

Testing and Inspection Bureau

Hunt & Co., Robt. W............... 92

Tiles

Smith Marble & Construction Co., 76

Tanks and Stand Pipes

Berg Machinery Co...................
Inglis, John 67
Jenckes Machine Co.... 2
Leonard & Sons, E......... 73
Marsh & Henthorn.... 71
McDougall Caledonian Iron Works.. 69
Ontario Wind Engine & Pump Co. 72

Trade Journals

Castellanos A. W.................. 72

Valves

Canada Iron Corporation.... 87
Gartshore-Thomson Pipe Co.. 86
Kerr Engine Co............. 91

Ventilating and Heating Apparatus

Sturtevant Co., B. F............... 71

Water Softeners and Filters

Berg Machinery Co.................
American Water Softener 90

Wire Rope

Canada Wire and Cable Co...... 95
Greening Wire Co., B.. 93
Smith, Thos. & Wm............ ....
Steel Co. of Canada 19

Wire Guards and Screens

Canada Wire Goods Mfg. Co. 82
Crescent Wire Iron Works.........
Greening Wire Co B............... 93
Sackett Screen & Shute Co 94
Steel and Radiation................ 23

Water Wheels

McDougall Caledonian Iron Works. 6
Canadian Boving Co....... 73

Water Turbines

Escher Wyss & Co....... ....

Wires and Cables

Canada Wire and Cable Co....... 95

Wheelbarrows

Sackett Screen & Shute Co......... 94
Parker, S. E....................... 20

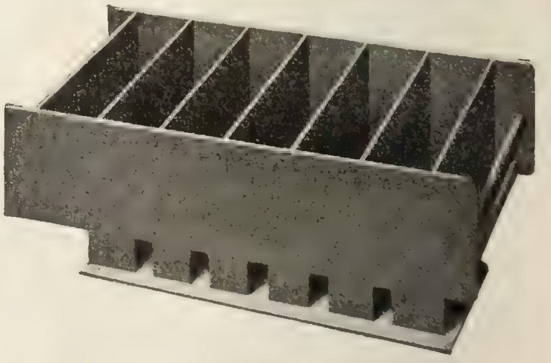
THE POPULAR AND SUPERIOR
PERFECT
BRICK MACHINE
AND MY VARIOUS MOULDS ARE USED
IN ALL PARTS OF THE WORLD
Patented in Canada

C. S. WERT
Inventor and Manufacturer of
The Perfect Brick
Machine and Moulds
602 North Main St.,
Kendallville, Ind., U. S. A.

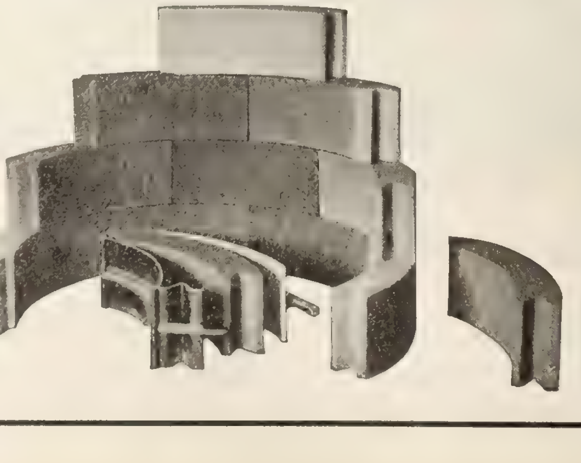
Write for Catalogue and Prices

Agents and Distributers wanted
in Canada.

THE POPULAR AND SUPERIOR
PERFECT BRICK MOLD
IS USED IN ALL PARTS OF THE WORLD

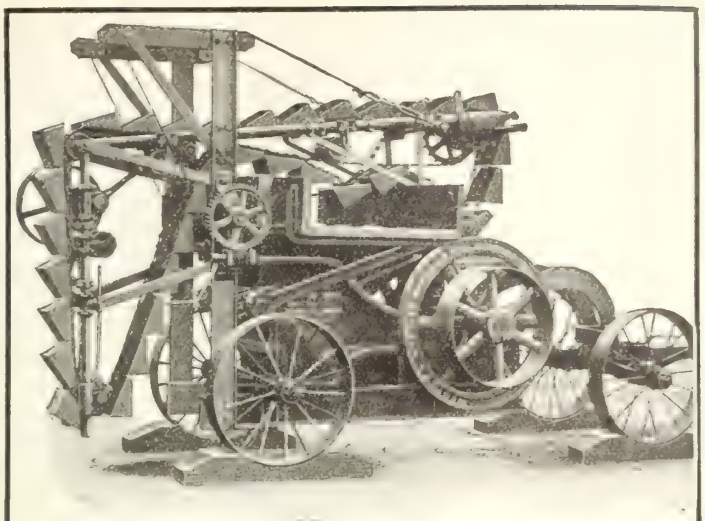


The Perfect Well, Cistern and Silo Molds



PRICE LIST
No. 3 Circle Mold. The diameter of its circumference, 3 feet.
No. 5 Circle Mold. The diameter of its circumference, 5 feet
No. 7 Circle Mold. The diameter of its circumference, 7 feet.
All sizes up to 7 foot retail at $12.00 each. All other sizes retail at $15.00 each.
The Circle Moulds vary in length from 22 to 28 inches, depending on the diameter of its circumference.
In ordering Circle Molds always give the diameter of what you are going to build and I will then understand the kind of Circle Mold you desire
No. 10 ircle Mold is 10 ft. diam.
No. 12 " " " 12 " "
No. 14 " " " 14 " "
No. 16 " " " 16 " "
Price $15.00 each

MUNDERLOH & Co Ld.
MONTREAL.
Seamless Steel Traction and Lighting Poles.
Mannesmann Seamless Steel Pipes for Gas & Water Mains.
In Lengths up to 40 Feet.
An Improvement on Cast Iron.
All Pipes Tested 75 Atmospheres before Leaving Works.
Write us for Illustrated Booklet.
Send us your Enquiries.
We are Sole Agents in Canada for–
MANNESMANN TUBES.
For All Purposes.



Steel Castings and No Lost Motion

forged steel yoke, cross bars on yoke remove all strains from main frame, moving jaw given a compound oscillating and reciprocating motion so that crushing is **continuous,** are features of the

Aurora Steel Rock Crusher

Its compact form combines great strength with light weight, making it very portable, and **specially adapted for contractors' use.** Strongest and most durable crusher on the market combining maximum product with minimum power. Adjustable to various sized stone. *Get our Special Crusher Catalog*

Western Wheeled Scraper Co.
AURORA, ILL.

WE GIVE YOU

Appearance and Finish

When we install our **Kalameined Clad Fireproof Doors** for you, we give you really **Fireproof Doors** that are as fine looking as any kind of a wooden door. They have a very fine appearance and you can finish them to any color scheme. If finished in Mahogany they cannot be told from the real thing. Our goods are **machine made.** There is no bulging, no nail heads or seams. Send us your details and let us quote you a figure.

A. B. Ormsby, Limited
Experts in Fireproof Windows and Doors
Factories: - - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE
FOR
CONCRETE AND MACADAM

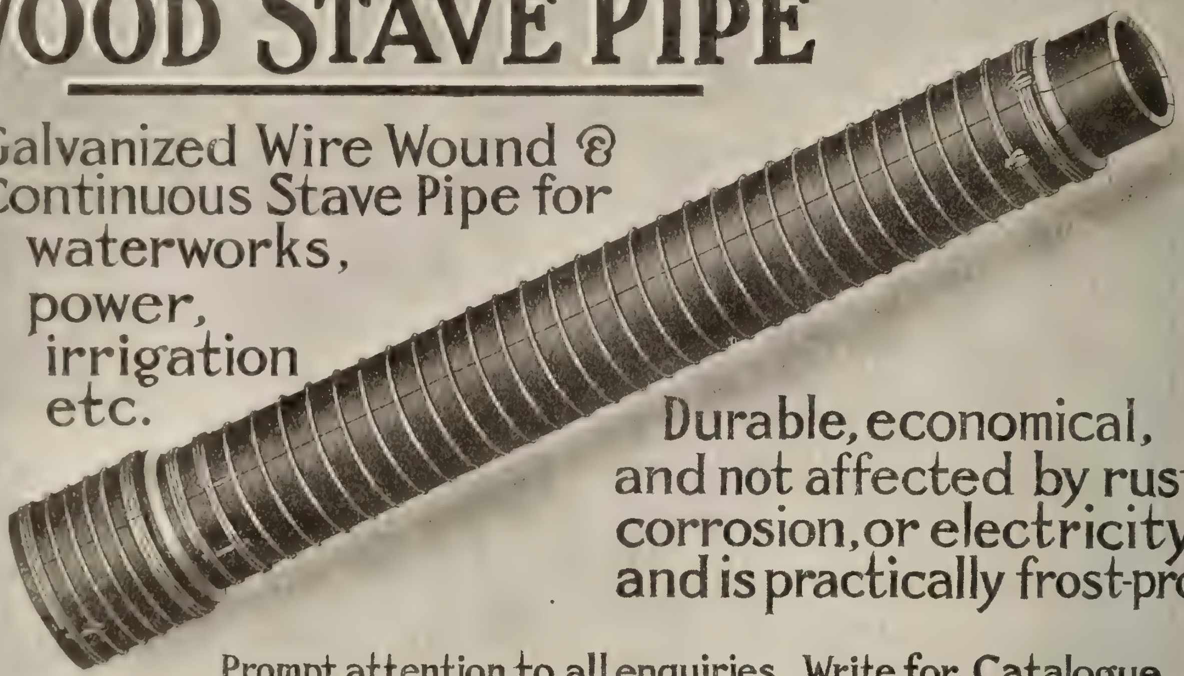
The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R.
and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.



WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.

Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

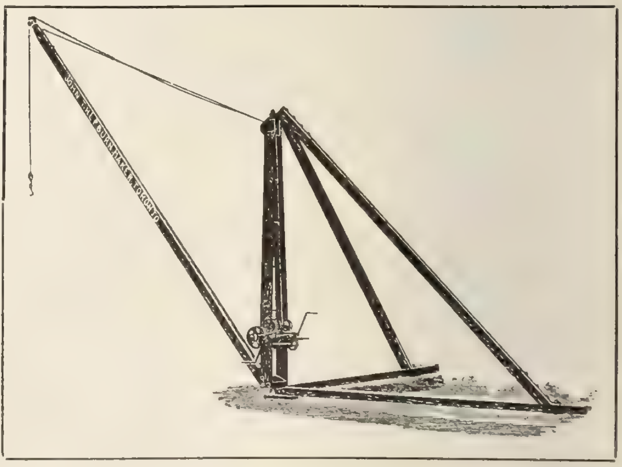
Better Order that Derrick To-Day

You have contracts on hand. Labour is scarce. And every day that passes means one day nearer the end of the season.

What are you going to do?

John T. Hepburn
Scotch Derricks

will do a lot of hard work in a little time. They are designed to do it, and built to do it—designed and built for the man who can see the spot-cash value of time saving and labour saving equipment. A HEPBURN DERRICK shows a labour saving over the old-Style derrick of fully 50 per cent. Can you afford to do without one.

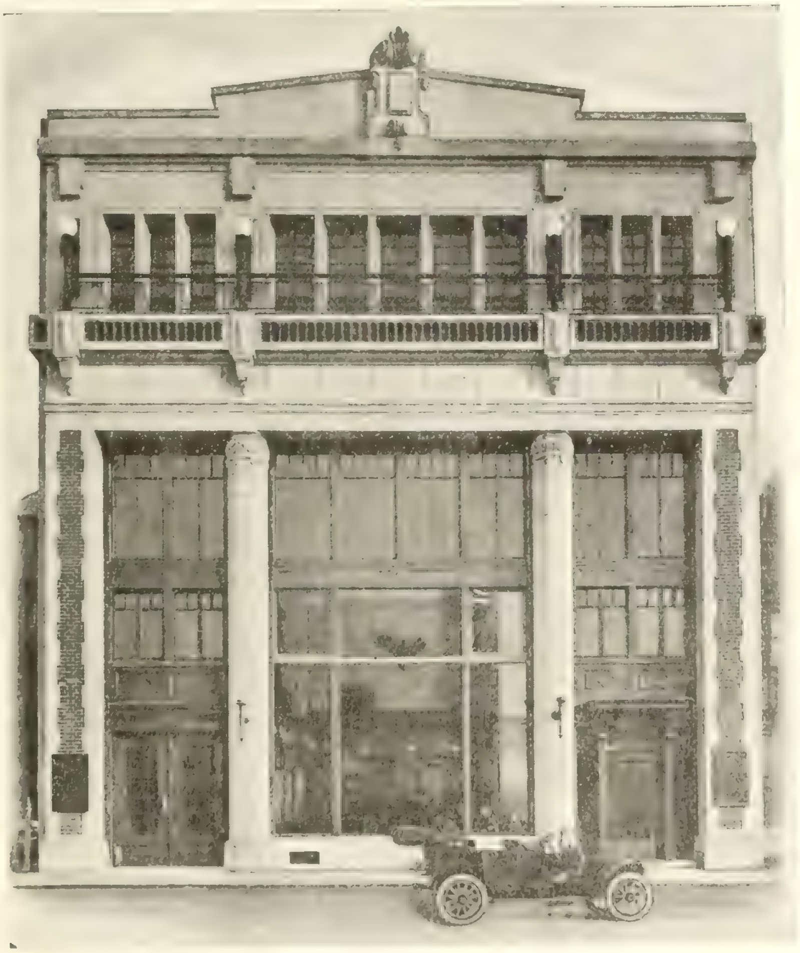


Don't wait till to-morrow. Write to-day for full particulars. One day now is worth two days later on.

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

Roman Stone

(Trade Mark Registered)



Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company
Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

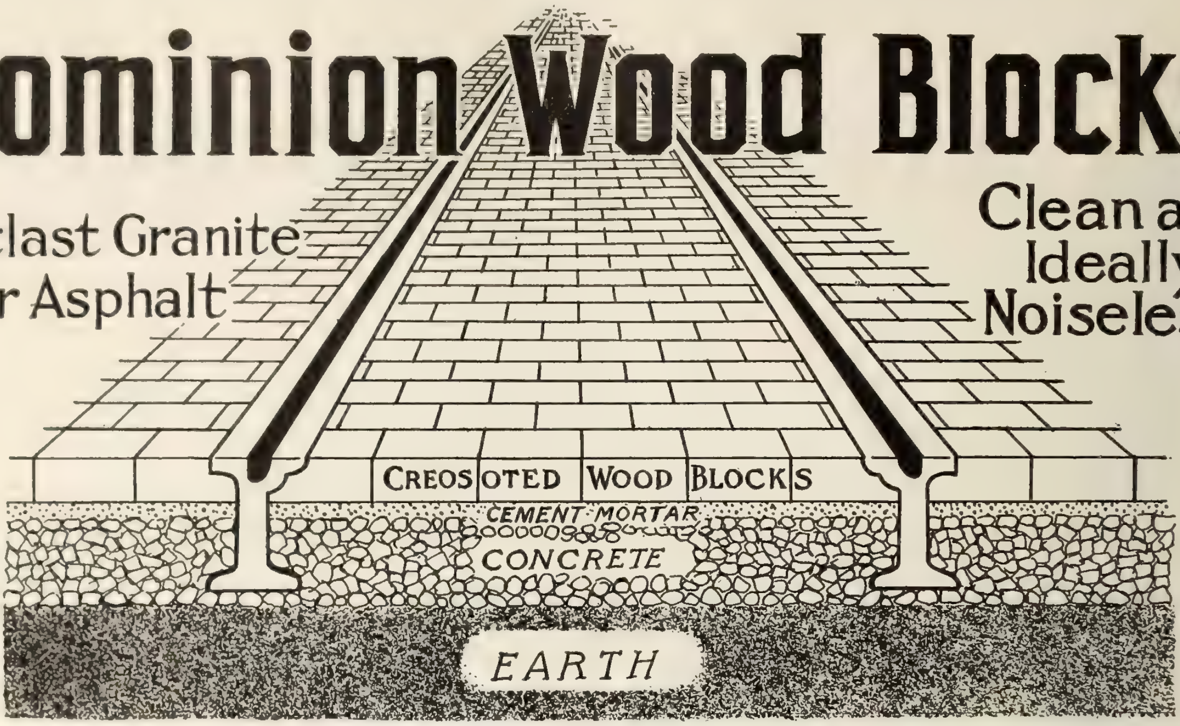
A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

Dominion Wood Blocks

Outlast Granite or Asphalt

Clean and Ideally Noiseless



Dominion Wood Blocks

make the most durable pavement for all classes of service, from the lightest wear of boulevard vehicles to the grinding of the heaviest trucking traffic. It is the one pavement that won't need the annual attention of the repair gang and will pass out of reserve in perfect condition.

Don't put your money in a pavement that will need patching before the final payment is made on the assessment.

The Dominion Creosoting Co., Ltd.

SUCCESSORS TO

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

"CHAMPION"

Road and Contractors' Machinery

makes contracting a business, not a gamble

There is no element of uncertainty as to just what you can look for from "CHAMPION" Machinery. It does its work and stands up to it—no expensive break-downs—no costly loss of time—no frequent tinkering—only the ordinary wear and that at a minimum.

In these days of competition, profit margins are not so large that anyone wants to run the risk of unexpected delays and expense. And yet everybody knows that unreliable machinery can easily sap away all the profit.

"CHAMPION" Road Machinery has exclusive features possessed by no others.

"CHAMPION" Road Machinery is made of the highest grade materials in the finest factory in the country devoted to this line.

The famous "CHAMPION" Rock Crushers with their double motion jaw, "CHAMPION" Elevator and Graders and various other machines have made this reliable line

"Standard in Canada for 20 Years"

Write for our catalogs telling us in which machine you are interested.

SPECIAL: Send all orders for repair parts direct to the Hamilton Machinery Co. and save 3 to 5 days.

American Road Machine Company, of Canada, Limited

GODERICH, ONT.

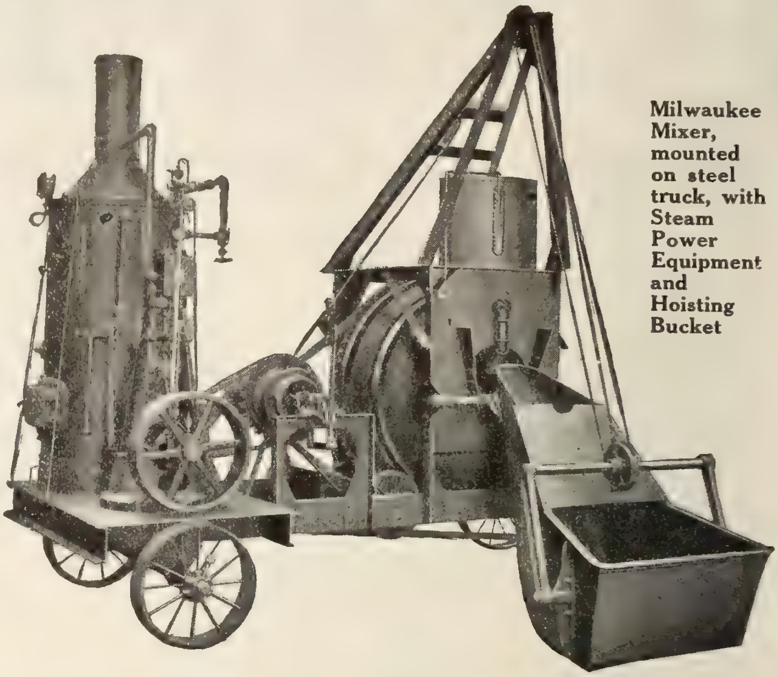
Address all Correspondence to

THE HAMILTON MACHINERY CO., LIMITED, HAMILTON, ONT.

(Sole Selling Agents)

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

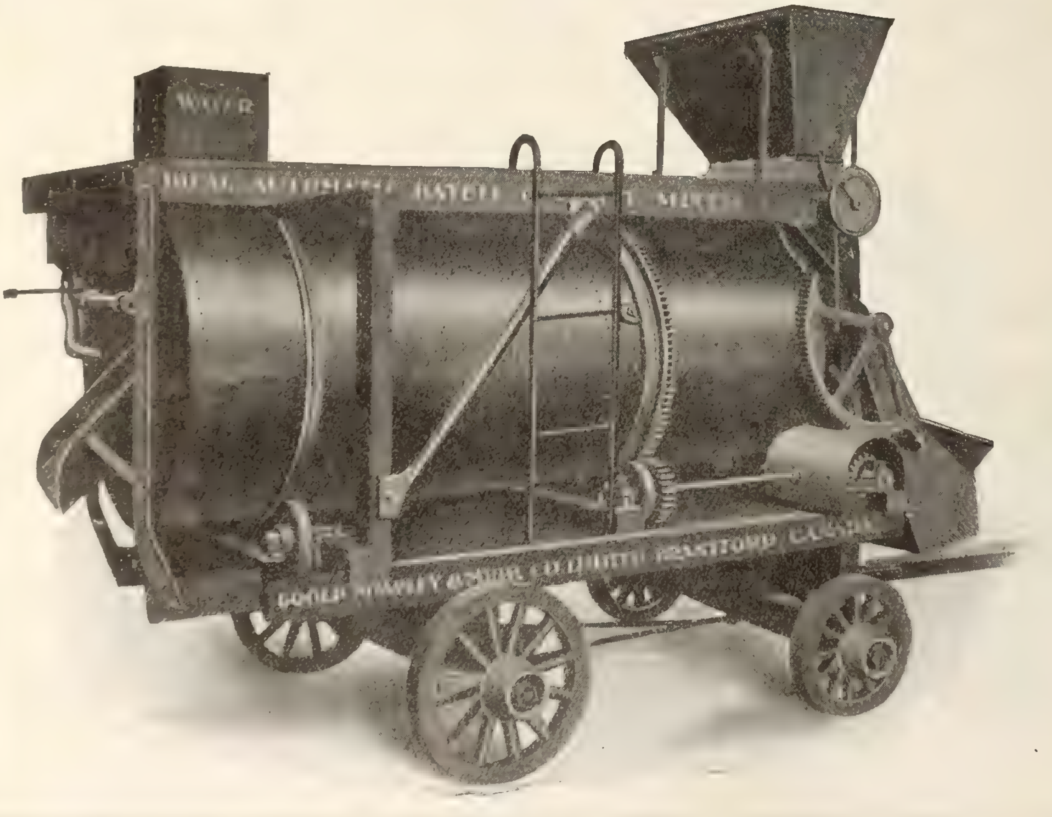
No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES.

The Stuart Machinery Co., Winnipeg, Man. C. W. Stancliffe & Co., Vancouver, B. C.
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

CONCRETE MIXERS



Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

Manufacturing 24 in., 27 in., 30 in., 33 in., 36 in., 42 in. and 48 in. pipe at Hamilton, Ontario.

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

Write for Illustrated Catalog

QUEBEC AND ONTARIO
Francis Hankin & Co.
231 Coristine Bldg., Montreal
199 Yonge St., Toronto

MANITOBA, SASKATCHEWAN AND ALBERTA
F. H. McGavin Company Limited
103 Osborne St., Winnipeg

BRITISH COLUMBIA
Pacific Lock Joint Pipe Co.
1005 A St. Tacoma, Wash.
Globe Bldg., Seattle.

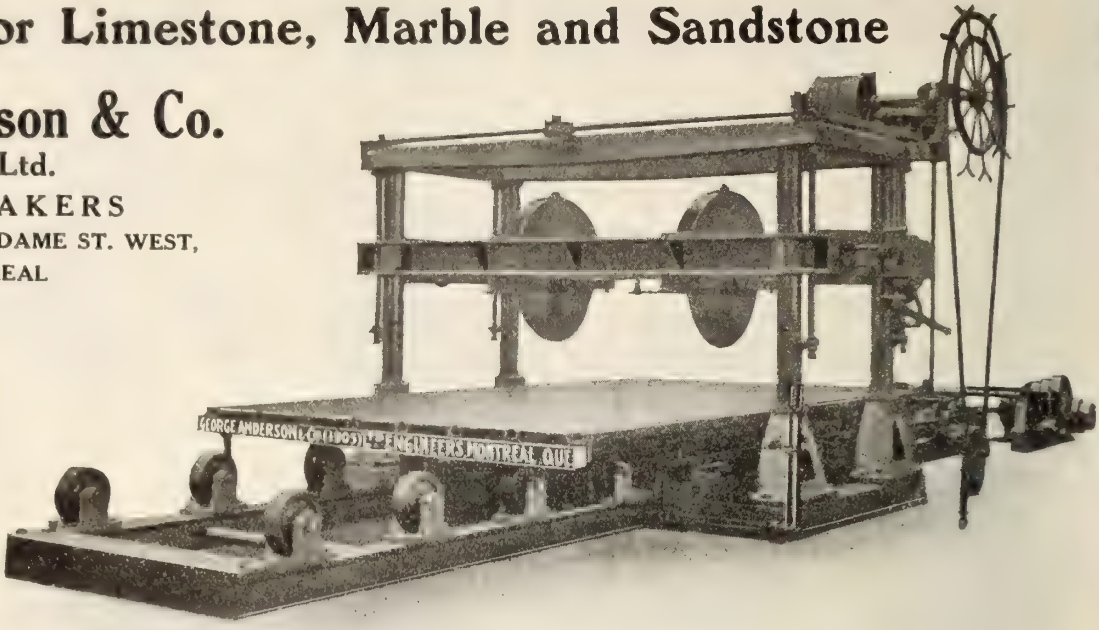
Circular Diamond Saws

For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICE & WORKS
London, England, 82 Victoria St. S. W., Newark N.J. U.S.A. 420-422 Ogden St., Montreal Works, 157 Craig St. West, Head Works, Carnoustie, Scotland

MAKERS OF
CANCS PLANERS, MARBLE DRESSERS DERRICKS, AND ELECTRIC TRAVELING CRANES UP TO 50 TONS, QUARRY MACHINERY, GAS ENGINES AND PRODUCER PLANTS 10 H.P. TO 150 H.P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 SINGLE AND DOUBLE TABLES

About 50 of the above Machines at work in Canada

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILE, CRESTINGS, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS
Head Office - - MILTON, ONT.
C. J. LEWIS, Proprietor
Montreal Agent: E. F. DARTNELL, 157 St. James St. Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade

USE

"TOCKOLITH"

(TOCH BROTHERS)

IT PERMANENTLY PROTECTS IRON AND STEEL AGAINST ALL RUST AND CORROSION

IT COMBINES WITH INITIAL RUST AND PREVENTS FURTHER ACTION

SEND FOR CIRCULARS AND INFORMATION

INVALUABLE FOR

STRUCTURAL IRON STEEL SMOKE STACKS
STEEL GIRDERS STEEL BRIDGES

CANADIAN OFFICE AND FACTORY

THE R. I. W. DAMP RESISTING PAINT CO.

1372-1376 BATHURST STREET - TORONTO

CANADIAN DISTRIBUTERS:

CHILLAS-BLACK, LIMITED
TORONTO

E. F. DARTNELL
MONTREAL

WM. N. O'NEIL & CO.
VANCOUVER

The Steel Company of Canada Limited
Hamilton - Toronto - Montreal

PLAIN ROUNDS, & SQUARES, COLD TWISTED SQUARES

MAXWELL DEFORMED BAR

STEEL BARS for Reinforcing Concrete

J. H. NEW, President RYLAND H. NEW, Vice-Pres.

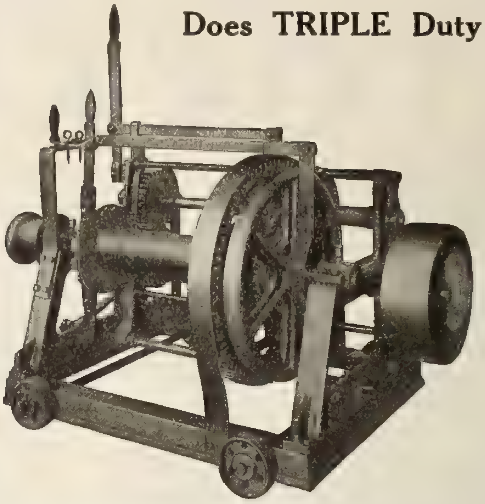
Hamilton Vitrified Salt Glazed Sewer Pipe

Known as the best for 50 years
The Quick Shippers

The HAMILTON & TORONTO SEWER PIPE CO., LIMITED
HAMILTON and TORONTO

LONG DISTANCE PHONES: Toronto, Main 990, College, 1558
Hamilton, 3990, 3991, 3432

The Parker Reversible Friction Hoist
Does TRIPLE Duty



Run with Gasoline Engine or Motor

No Experienced Operator Required

Drum. Elevator Sheave, Winch-head all operate independently of each other, and are each reversible. This hoist operates a derrick from the drum, a double cage material elevator from the sheave, and serves various other purposes from the winch-head—all on one job.

PAYS FOR ITSELF ON ONE ORDINARY JOB.

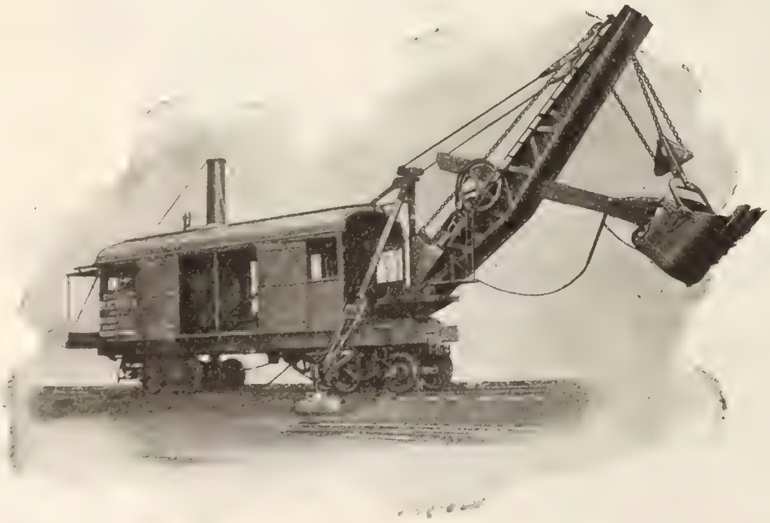
"I have used your No. 100 Reversible Hoist for over 5 years. It runs like a clock and has cost me nothing for repairs."
From an Experienced Contractor.

We also build derricks, steam and electric hoists in all sizes. Sole manufacturers of the PARKER PATENTED DERRICKS.
Write for information and prices.

S. E. PARKER, 1800-2 N. Francisco Ave., Chicago, Ill.

Selling Agents:
Gorman, Clancey & Grindley, Calgary and Edmonton, Alta.
J. L. Stuart Machinery Co., Winnipeg, Man.
A. G. Langley & Co., Vancouver, B.C.
F. H. Hopkins & Co., Montreal, Que.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

The

Standard Drain Pipe Co.

Limited

TWO FACTORIES:

St. Johns, P. Q. and New Glasgow, N. S.

MANUFACTURERS OF

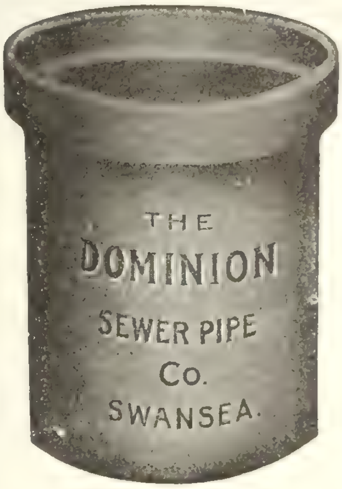
Sewer Pipes, Culvert Pipes, Chimney Linings, Hollow Building Blocks, Fire Clay, Stove and Range Bricks and all kinds of Fire Clay and Vitrified Goods.

Catalogue and prices on application

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.

(The Independent Co.) **Limited**

SWANSEA (near Toronto)

Mimico Pipe - Is Right

Round Pipe and Square Dealings

It is Vitrified and Salt-Glazed

AND WILL MAKE YOUR

Sewer or Culvert

A Credit to You

AS SMALL AS 4 AND AS BIG AS 24
SINGLE AND DOUBLE STRENGTH

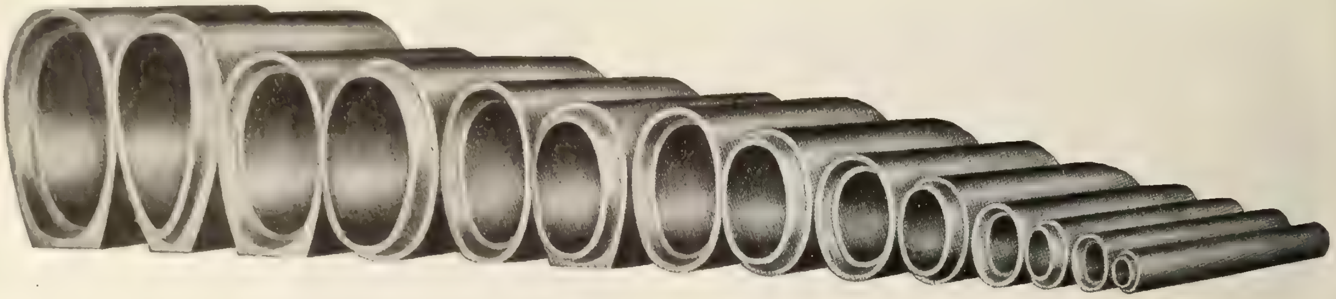
ORDERS PROMPTLY FILLED

Try Us

The ONTARIO SEWER PIPE COMPANY, Limited

MIMICO, ONTARIO

Telephones, Toronto Connection, Park 422; Evenings, Park 3888 and 3889



We Guarantee Our

Reinforced Concrete Pipe

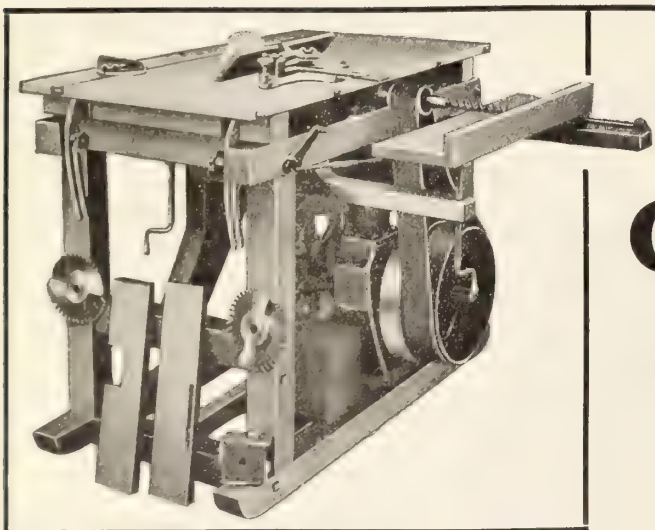
for Culverts and Sewers

"Long Service at Low Cost"

Our **Pipe** is **frost-proof, indestructible** and **everlasting.** It is easily handled, easily placed, and easily procured. It has been approved by **most particular, most renowned, most experienced,** and **most skilled engineers.**

Stock sizes 6 inch to 48 inch. Other sizes to order. Write for catalogue and prices.

Dominion Concrete Company, Limited
KEMPTVILLE - ONTARIO



On Every Concrete Job

You can save 10 to 15 per cent by using our Contractor's Portable Saw and Variety Woodworker.

Now is the time when you are starting to do your concrete work and this saw will be just what you are looking for—a cheap practical saw that will prove itself a time saver and money maker for you.

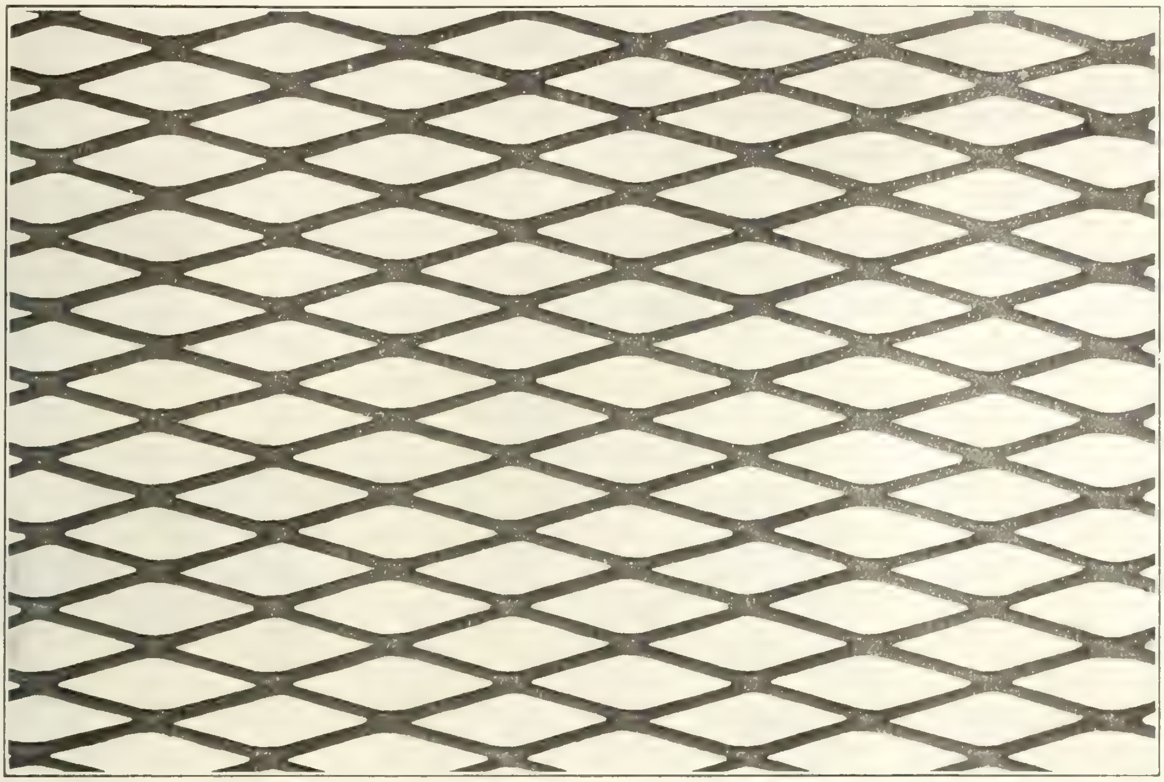
CONTRACTORS SUPPLIES OF ALL KINDS

The
Canadian Fairbanks Co., Limited
Fairbanks-Morse Gas Engines, Fairbanks Scales. Safes and Vaults.

Montreal Winnipeg Toronto Vancouver
St. John, N.B. Calgary Saskatoon Ottawa

WHAT IT IS

- A Rip Saw
- A Matcher
- A Mitre Saw
- A Cut-Off Saw
- A Dado Machine
- A Jointer
- A Boring Machine
- A Gaining Machine
- A Grooving Machine
- A Babbitting Machine
- A Moulder with Self-Contained Power



"Steelcrete" Diamond Mesh — the Lath with a Reputation

Since Expanded Metal was first made in Canada "Steelcrete" has been the acknowledged standard from Coast to Coast.

To-day, there are more yards of it in actual use, probably, than all other Canadian Laths combined —a few "Steelcrete" jobs being the King Edward Hotel, Toronto, the Royal Mint, Ottawa, Ontario Parliament Buildings, Toronto, Winnipeg Post Office, new East and West Blocks Dominion Parliament Buildings, Ottawa.

"Steelcrete" Expanded Metal Lath

-weighs $3\frac{1}{2}$ lbs. per square yard—half as much again as is claimed for laths of same gauge.

-acquiring rigidity by shape and weight of strand has no raised ribs or beads to bury—hence makes plastering easier, quicker and cheaper.

—being made in sheets 30" wide wastes only half as much in laps and costs only half as much to apply as other laths.

—is made by same process and with same care and precision as heavy expanded metal therefore is perfectly flat and straight.

Samples, Prices and Lath Catalogue on Request.

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE FRASER AVENUE

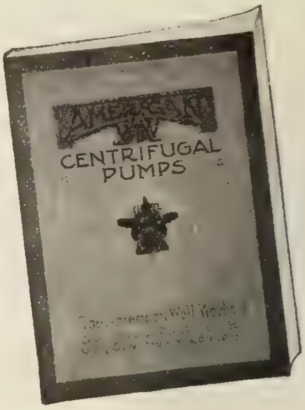
MONTREAL
138 CRAIG STREET WEST

St. John—13 Germain St.
Quebec—153 St. Paul St.
Ottawa—83 Banks St.
Regina—Black Block

Fort William—113 N. May St.
Winnipeg—334 Garry St.
Calgary—309 8th Avenue.
Vancouver—416 Pacific Bldg.

Why "American" Centrifugals

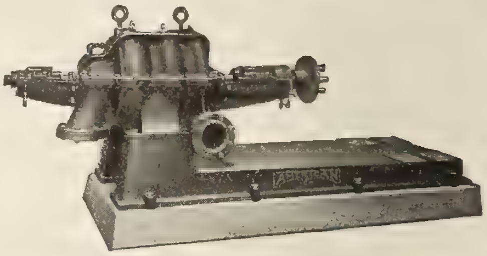
Are Most Economical in the Widest Range of Pumping Conditions.



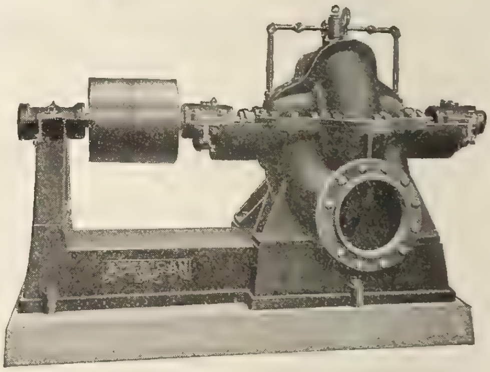
The reason why "American" Centrifugals are unequalled for economy is that they represent the highest development of the most modern type of pump and there are the best of reasons for this higher development.

Instead of building a single type of centrifugal and recommending it for every purpose "American" centrifugals are built in over fifty distinct types and every size of every type is carefully tested in our own complete hydraulical laboratory and its efficiency proved before it is permitted to leave our works.

It must meet our standard of efficiency before it is allowed to leave our works and that is what is making the American trademark famous in pumping machinery.

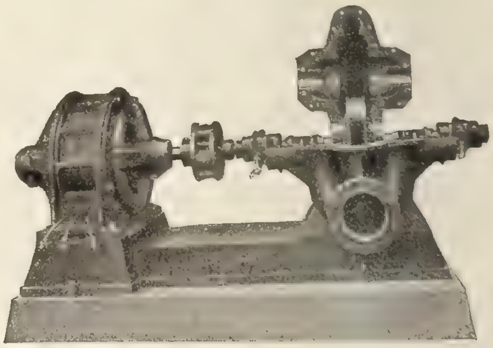


AMERICAN



"American" centrifugals attain up to 80 per cent. mechancal efficiencies and many of our specially designed pumps, installed according to our own specifications, show much higher efficiencies, enabling them to operate against high heads. We have many single stage centrifugals installed operating on over 200 feet heads.

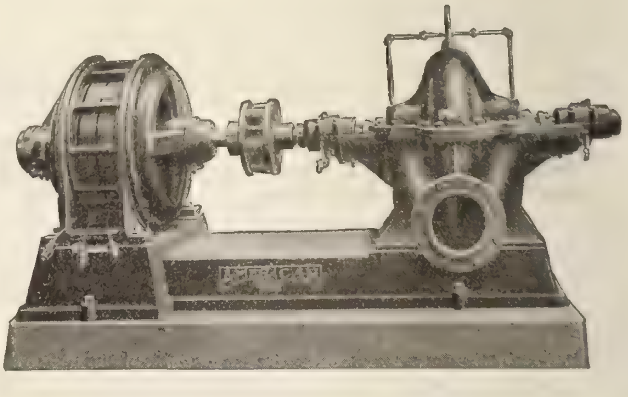
The low first cost of "American" centrifugals as compared with old style plunger pumps, combined with their high efficiencies, low cost for attendance and small cost for repairs make them **far more economical** than any other type of pump in nearly all conditions where **all costs are considered.**



Greatest economy in the end is the claim we make for "American" centrifugals and we are ready to prove that claim.

If you are interested in irrigation, write for our booklet, "Irrigation by Pumping" Bulletin No. 118.

Our General Centrifugal Pump Catalog No. 117 is the most complete ever issued. Write for it today.



The American Well Works

General Office and Works: Aurora, Ill., U. S. A.
Chicago Office: First National Bank Building

Canadian Sales Agency:
234 Craig Street West, Montreal
441 Seymour Street Vancouver, B.C.

TENTS

for Engineers and Contractors

We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

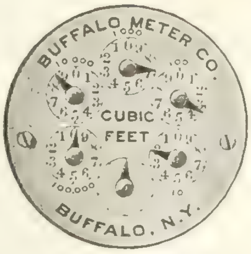
Send for our catalogue
It will interest you

Woods Limited

Woods Building - Ottawa, Ont.

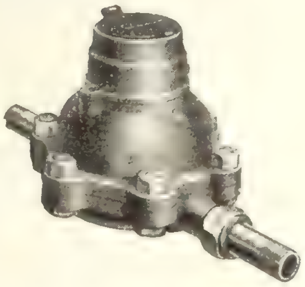
AMERICAN AND NEW NIAGARA

WATER METERS



Standard Dial

Straight Reading Dial



Jewel Bearing
Intermediate Gears
Self Cleaning and Sanitary
Adjustment for Pressure
Extra Thick, Strong Disc
Accuracy Guaranteed
Fewest Parts

BUFFALO METER CO.

290 TERRACE, BUFFALO, N.Y.

The United States Steel Corporation, at Gary, Ind.;
Stone & Webster Engineering Corporation, Minneapolis, Minn.;
A. Monsted Co., Milwaukee, Wis.;
Geo. B. Swift Co., 903 Security Bldg., Chicago.;
Pacific Coast Condensed Milk Co.. Seattle, Wash.;
Sheffield Farms-Slawson Decker Co. Amenia, N.Y.; and
Inland Steel Co., Indiana, Ind.,
are among the largest users of concrete in the United States. They and many others, are using

REICHERT METAL FORMS

And saving from 3 to 7 cents per square foot.

Why do YOU stick to the old methods and let this additional profit slip away from you?

Building a big factory building with Reichert Metal Forms. Pacific Coast Condensed Milk Company's plant at Berlin, Wis. Stone & Webster Engineering Corporation, builders.

REICHERT MFG. CO.

MILWAUKEE, WISC., U.S.A.

Neptune Meter Co.

Manufacturers of the well-known

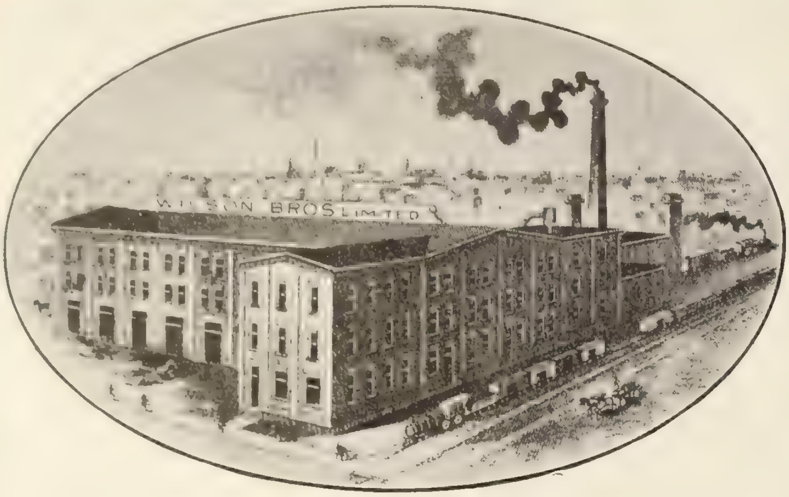
TRIDENT

Frost-Proof Water Meters

Write for Catalogue

Main Office - 90 West Street

New York City



Hardwood Flooring and Interior Finish

"Wilson Bros. Limited" on flooring means a carefully kiln dried and well manufactured article. Our flooring is straightened, hollow-backed, bored, end-matched, steel polished and bundled. -:- -:- -:-

We specialize in Veneered Doors to detail.

Wilson Bros. Limited **COLLINGWOOD, ONT.**

The Mushroom System

Of Reinforced Concrete is strong, economical and durable. Based on scientific principles, every pound of steel does the work it is designed to do.

The system is fully covered by broad patents in Canada, the United States, and all civilized foreign countries.

For lists of buildings, descriptive literature and estimates, address

C. A. P. Turner, M. Am. Soc. C. E.
816 Phœnix Building, Minneapolis, Minn.

Diagonal or French Method of laying 12"x 12" Asbestos Shingles

"Asbestos Shingles"

They Last Forever

Asbestos Cement Slate is a scientifically prepared roofing material and, like concrete, it improves and becomes harder with age.

"Asbestos Shingles," besides being waterproof, fireproof and weatherproof make an exceptionally cool roofing.

"Asbestos Shingles" possess extremely high physical strength and elasticity rendering them immune to destruction by blow or shock.

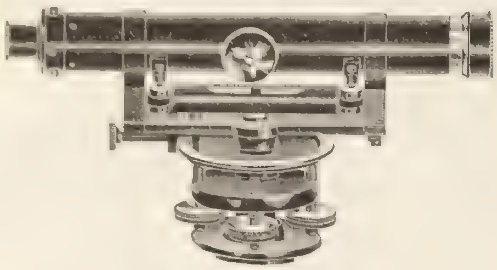
Your repair bill on "Asbestos Shingles" will be "O."

ALWAYS SPECIFY

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P. Q.
Factory at Lachine, P. Q.



Extract from a recent letter from a Railway Engineer:

" With regard to the transit I purchased from your firm, I am thoroughly satisfied with it; and for the work in which I am engaged, i. e., railway surveying, I do not think it could be surpassed. The telescope especially is far superior to any I have ever used before in every respect, but particularly in power, and sharpness of definition."

Original can be seen with many others.

Drafting materials, drawing instruments, scales and tapes, slides, rules, drawing, paper, tracing cloth, etc., etc.

Look for us in the Manufacturers' Building, Toronto Exhibition

Toronto Agents for E. R. Watts & Son

Consolidated Optical Co. Ltd.

400 Richmond Street West

Toronto - - Ontario

CALLING FOR TENDERS

Consulting Engineers and Municipalities with a contract to let should advertise in the

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

the great national medium for advertising "Tenders Wanted". Carries more paid tender advertising than all other Canadian technical publications combined, which means it is securing for its advertisers

"More Bids and Closer Bids"

Send all advertisements to the Head Office, 220 King Street West, Toronto, and your plans and specifications to any one or all of our offices where they will be shown to prospective tenderers free of charge.

Contract Record

Montreal
B34 Board of Trade

Toronto
220 King St. W.

Winnipeg
404 Traders Bdg.

Vancouver
26 Crowe & Wilson Chambers

British Made

Terra Cotta

the product of

King Brothers, Limited

STOURBRIDGE, ENGLAND

Proprietors of Stourbridge Clays

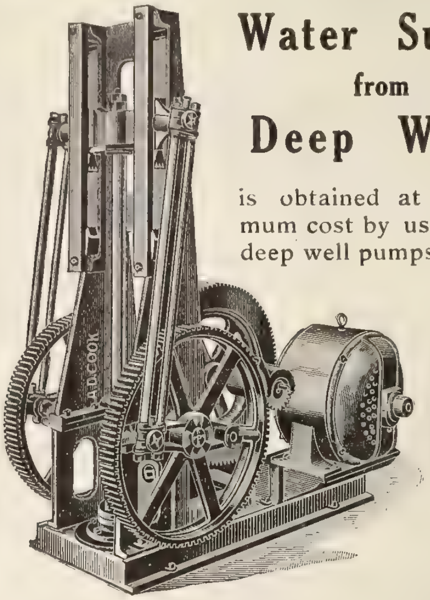
REDS--BUFF--STONE--GREY

and all Colors, Glazed and Unglazed

Estimates on application by

The Toronto Plate Glass Importing Co

Tel. M. 3877 Don Roadway, Toronto Limited



Water Supply from Deep Wells

is obtained at a minimum cost by use of our deep well pumps.

Write for Bulletin 26 explaining the use of Cook's Patent Brass Tube Well Strainer

A. D. COOK

Lawrenceburg, Indiana, U. S. A.

Manufacturer of a Complete line of **DEEP WELL SUPPLIES** including Steam, Belt and Motor Driven **DEEP WELL PUMPS**, Wind-mill and Hand Pumps, Working Barrels and Valves, Pump Rods and Pump Rod Joints, Drill Rods and Drill Rod Joints, Drilling and Well Tools.

CATALOGUE MAILED UPON REQUEST.

For QUICK and THOROUGH mixing it takes a WETTLAUFER MIXER

That is what our customers say and they know. I't the **heart-shaped drum** that does the trick of speedy mixing and discharging.

Our mixers are easily cleaned and cost nothing for repairs. Every mixer guaranteed for one year against breaks from defective material. Power costs are reduced to a minimum with the Wettlaufer mixers.

WETTLAUFER BROS., 178 Spadina Ave., TORONTO

A. R. Williams Machinery Co., 15 Dock St., St. John, N.B. W. E. Ransome, Moose Jaw, Sask

The
Rogers Supply Co.
28 King St. West - - - Toronto

Stone
Cement
Sand

Prompt Delivery Service ::: Main 4155

KITON is nothing else but **TAR**
which through a Patented Process is made
Soluble in Water

This solubility however is lost, the moment KITON becomes dry for the first time, that is, after evaporation of the water with which it is mixed. From that instant on, KITON can never be re-dissolved in or washed off by water. It is **impervious** and **weatherproof.**

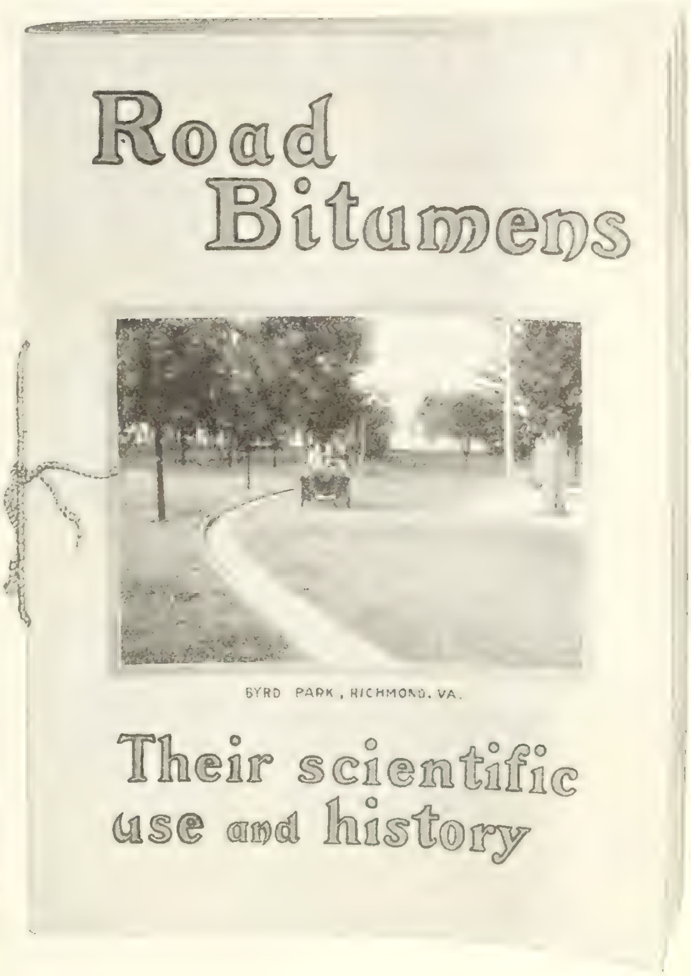
just like tar

BECAUSE it can be applied as easily as ordinary paint,
" it can be coloured if desired,
" it is so economical and yielding,
" it is instantly ready when you want it,

KITON is the cheapest and most reliable surface coating for material subjected to the deteriorating action of weather and atmosphere.

ASK FOR BOOKLET, SAMPLE AND PRICES
ATTRACTIVE PROPOSITION FOR DEALERS

F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.



Road Bitumens

BYRD PARK, RICHMOND, VA.

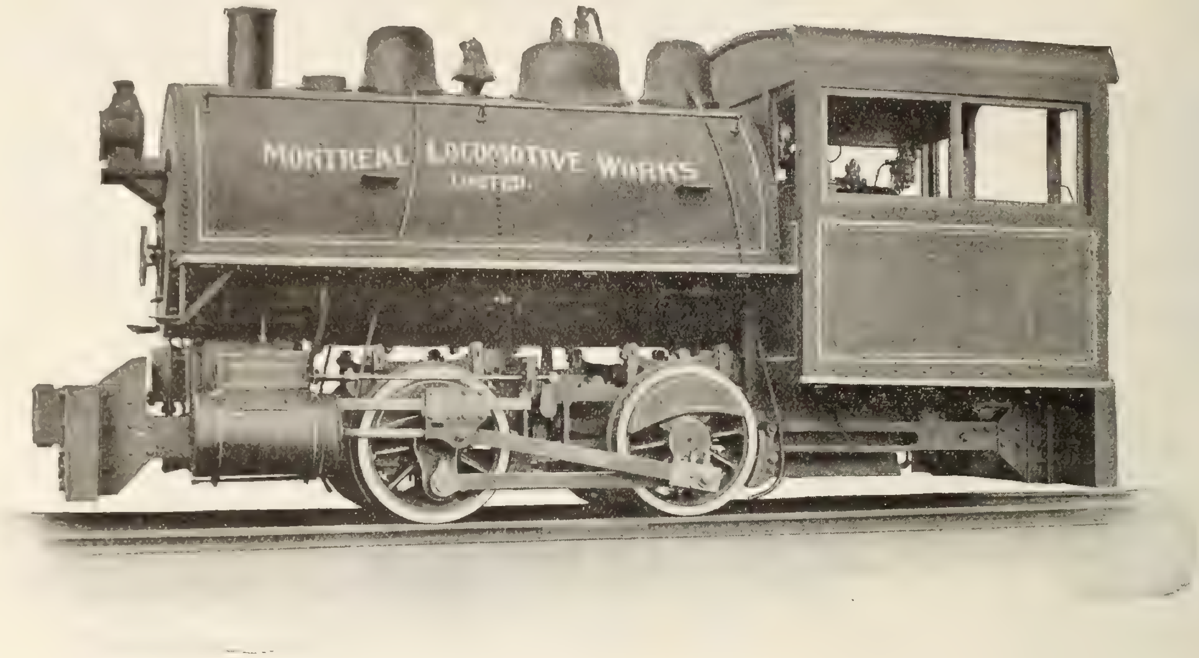
Their scientific use and history

There was published in January, by the Good Roads Improvement Company, Cincinnati, a book on the subject of road bitumens, their history and use, together with the summary of the reports made by the U.S. Government, American Society of Civil Engineers, etc. The book is profusely illustrated; also a pamphlet on the subject of road oilers for applying the material hot, or at atmospheric temperature.

Send for the Book

Good Roads Improvement
Company
First National Bank Building
CINCINNATI

CONTRACTORS LOCOMOTIVES



ONLY ONE QUALITY

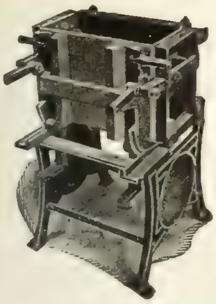
Montreal Locomotive Works, Limited, standard contractors locomotives are designed by engineers who have made a life study of the special conditions of contractors service and know what is needed to meet these conditions.

Their large boilers insure free steaming and ability to handle the load for which they are rated. Every piece of material entering into their construction must conform to the same specifications required for 200-ton locomotives. Only the best materials are used.

Contractors locomotives must frequently be operated long distances from repair shops, therefore simplicity and facility for repairs are vitally necessary. This was considered in designing this type of locomotive.

Every part is made in jigs or to gauges, and every part is sure to fit. Stocks are always available at our Works at Longue Pointe, Montreal, Canada.

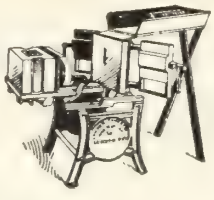
MONTREAL LOCOMOTIVE WORKS, LIMITED
OTTAWA BANK BUILDINGS, MONTREAL, CANADA



London

Face-Down Adjustable

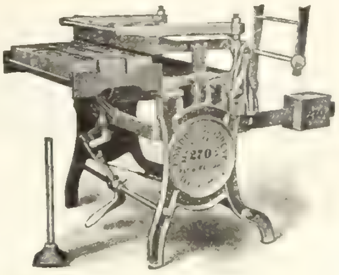
Concrete Block Machine



makes every kind, size and design of block. **All sizes of blocks made** in the **one adjustable mould. All sizes of blocks made** on the one **size pallet.**

Any size core desired can be used which is withdrawn vertically and thus allowing all blocks to be made by the wet process, or with crushed stone in the block. Machine fully **covered by patents.**

SEND FOR CATALOGUE.



London Cement Pressed Brick Machine

Hundreds in operation. Needs no recommend from us. The brick **have frog impression.** The only machine which makes a brick **polished on every side.** Our **self-racking pallet** does away with racks for curing which makes it possible for the contractor to manufacture the **brick on the ground** where the building is to be erected. One man operating makes 5000 brick per day.

Our catalogue tells all about it.

The London Adjustable Sill, Step and Window Cap Mould

Every Contractor and Manufacturer of Cement Products should know the class of goods that can be produced on this mold. **Can you afford to be without one?** Write for catalogue and learn what this mold will do.

We also manufacture London Standard Drum Batch Mixers in five sizes, London Automatic Batch Concrete Mixers in two sizes, Cement Brick Machines, Face-Down Block Machines, Power Drain Tile Machines, Hand Drain Tile Machines, Silo Curbs, Sewer Pipe Moulds, Ornamental Moulds, Cement Working Tools and a full line of Concrete Machinery.

We are the Largest Manufacturers of Concrete Machinery in Canada

London Concrete Machinery Co., Ltd., 19 Marmora St., London, Canada

Branches

A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
Hamilton Machinery Co., 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.
Foss & Hill Machinery Co., 329 St. James St., Montreal.

(See Our Exhibit at Toronto Exhibition, South-east of Machinery Hall, or London Exhibition in Cement Machinery Hall.)

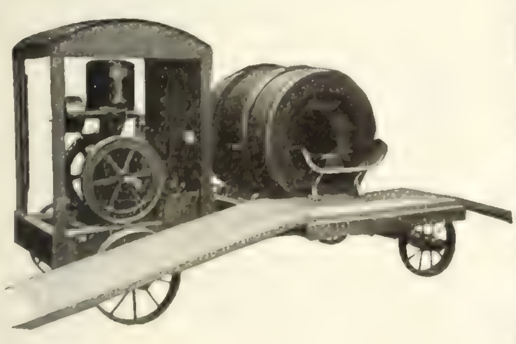
To Any One Who Will Investigate

There is a fact that compels Conviction That The Eclipse Low Charging Concrete Mixer

SAVES MONEY

Saves in the first cost of the machine, saves in power, saves in fuel, saves in manual labor, saves in attendance of the machine, saves in portability, saves in delays, and saves in repairs.

Figure all of this saving and the aggregate saving is so important that the greater economy must be evident to you.



First of all it charges only about 2 feet from the ground. There is no charging elevator required, no mechanism to operate a charging elevator, no extra man to attend it and no additional power required to operate it.

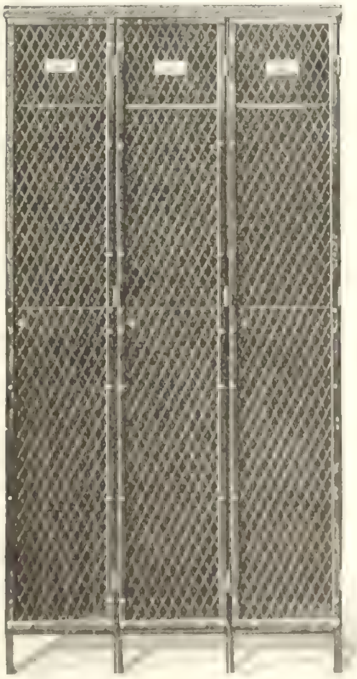
There is only the simple mixing drum direct connected to the power required to operate it, so simple, so compact and so portable that the workmen can move the mixer to any location on the job in a moment's time. And the large, open drum removes all guess work from the mixing. You can see the entire batch when mixing.

Catalog No. 45 describes it. Shall we send the catalog.

The STANDARD SCALE & SUPPLY Co

New York, 136 West Broadway; Pittsburg, 243-245 Water Street; Philadelphia, 35 South Fourth Street; Chicago, 1345-1347 Wabash Ave.

The Up-to-Date Building



Should be equipped with metal lockers for the safe and sanitary keeping of clothing.

If you appreciate good value and rigid construction in a locker, you will use MEADOWS' METAL LOCKERS on your next contract.

Send for our interesting booklet entitled

"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA

SPECIAL REPRESENTATIVE
C. L. TRIMINGHAM
Canada Life Bldg.
WINNIPEG

Concrete Mixers

We want to send you a booklet giving a brief and interesting history of our Mixer. Before you make any further purchases it will pay you to read our literature which is based on actual results. Let us know your wants for we believe we can interest you in our Concrete Mixer.

485 St. James St.,
MONTREAL

485 St. James St.,
MONTREAL

CANADA FORD COMPANY

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

THE STANDARD IDEAL COMPANY LIMITED
GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

THE STANDARD IDEAL

Automatic Individual Bowl Syphon Action Range Closet

The most perfect range closet ever produced.

Write for our Booklet "E"

showing our Range Closets and Urinals and giving roughing measurements.

Plate F. 517

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76 82 LOMBARD ST.

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 August 16, 1911 No. 33

A Result of Revision

With the proposed readjustment of the Toronto building by-law the question has arisen as to whether the local brick makers will experience any material decrease in the demand for their products. For some time there has been an unprecedented call for all classes of brick in the city for residence, factory, mill and office buildings, and the supply has been taxed to the limit.

It will be some time, of course, after the revision occurs before reinforced concrete asserts itself to molest the present prices of brick, so great has it been retarded during recent years by the stringent conditions that are still applied to this class of building in the city. American cities with their well utilized application of reinforced concrete, are already years in advance of Toronto in modern fireproof structural work. However, when the time arrives in which these buildings commence to increase in size and number, the advance will be sane and safe, as they will be featured with a knowledge of the mistakes and difficulties of their earlier kin.

The city of New York has adopted the use of reinforced concrete in the erection of its city buildings to such an extent as to meet with a formal protest from the Greater New York Builders' Association a few weeks ago. The issue arose from the city's contemplating the erection of 48 fire company houses, all to be built of concrete. The association meeting was attended by a large number, representing over seventy concerns manufacturing brick and tile. The discussion brought out the fact that most of the buildings being erected in the city were of concrete, and that the brick industry was suffering by the more general use of cement product.

In Toronto there is ample field for the steady use of both materials and there is no occasion to attempt to force either of them into every conceivable application. When the unusual severity of the Toronto by-law towards reinforced concrete construction has been moderated there will be an influx of concrete structures, the building of which has been withheld until the allotted time. This branch of building material will receive the attention it deserves, but in its own field, and it is altogether likely that the field of the brick industry will suffer no material infringement or limitation. Such a state of affairs would be in the best interests of Toronto building, as the builder will then be able to choose with lessened restriction, and increased freedom, between materials.

The Necessity of Skilled Labor

The fallacy that concrete can be properly mixed and placed by any kind of labor under any kind of supervision is fast disappearing, and every specification for concrete work should contain a clause after the manner of the following: All reinforced concrete must be constructed by laborers skilled in this special field and under the supervision of an expert in reinforced concrete construction.

The loads and stresses in the proposed construction are usually high, and while the design may have been carefully prepared with due consideration of safety factors and accurate locations for steel, much depends on the manner in which the work is executed, and the engineer will not jeopardize the construction by permitting incompetent workmanship.

The factor of safety that is required for building materials is accompanied by an additional factor of safety for labor. In case of both concrete and reinforced concrete the former item has become very fairly defined as to strength by experiment and experience. It is the workmanship factor that here demands the most serious and strict inspection and no matter how careful the inspector may be some defects are almost sure to be overlooked unless the workmen themselves are competent to judge in cases of poor ingredients, too rapid setting, removal of forms or improper mixing.

In the interests of concrete construction the report of the commission that was appointed to thoroughly investigate the failure of the Heinke Building in Cleveland is of great value, since nothing developed to cast doubt in any way upon the efficiency of reinforced concrete as a building material. The city building department, the architect, the owner and the contractor are all indicated as contributing to the failure by acts of either commission or omission. The report of the commission is given below.

It is the belief of the commission that the architects were negligent in the following respects:—

1. Although the evidence shows that the architects advised and requested the owner to place a special reinforced concrete inspector on the work during the progress of construction, they did not specifically call the owner's attention to section 473 of the building code, which, by "mandatory requirements," provides that the owner shall place such an inspector on the work.

2. The architects did not name in the application for the building permit a special inspector, as required by section 473, who was to be continually on the work during the placing of concrete and steel.

3. The architects did not give adequate consideration to the removal of the forms of the concrete work. They evidently gave little attention to weather conditions from October 22 to November 22, inclusive, when, according to the United States weather reports, there were 16 days of which the temperature was at or below 35, on 9 of which the temperature was 32

or below with a minimum of 25; and during which time there were only 4 clear days with 15 days of rain or snow. Under these weather conditions more than ordinary precaution should have been taken in the removal of forms.

4. The architects did not give adequate consideration to the sand used in the building. The specification called for washed sand, while unwashed sand, not of uniform quality, was used.

5. The architects did not exercise proper judgment in advising the owner in regard to the rapidity with which the work could be safely prosecuted.

It is the opinion of your commission that the contractor upon signing the 'contract, assumed the responsibility of executing the work in accordance with the plans and specifications. The contractor was negligent in the following particulars:

1. The foremen employed on the building were ignorant of the requirements of the drawings and specifications; did not exercise proper care in the measurement and mixing of concrete aggregate and the placing of reinforcing steel; allowed brick work and erection of forms to proceed upon green concrete; and conducted the work generally in a loose, slipshod and hurried manner.

2. The reinforcing steel was carelessly placed in ribs, girders and columns, and "no provision was made to insure steel being in its proper position after concrete had been poured."

3. The structural members of concrete were not of proper sizes, concrete was of poor quality and not properly placed.

4. The sand used was, in many cases, of inferior quality, contained loam and clay and did not meet the specification requirements for washed sand.

5. The cement delivered at the building was apparenly 20 per cent. less in amount than the amount necessary to properly construct the work in accordance with the specifications.

6. The forms were usually removed without the consent of the architects in violation of the specification requirements.

In the east side of the third storey, forms, supporting the fourth floor, were removed in 16 days after the pouring of concrete, and the floor re-shored. The removal of these forms, in this short time, was, considering the weather conditions during the month of November, extremely dangerous. This time would hardly have been sufficient under favorable weather conditions.

These forms were removed without the consent of and contrary to the instructions of the architects.

It is the opinion of your commission that the removal or changing of these forms and shores was the one primary cause of the collapse.

In the opinion of your commission the owner was negligent in that he did not employ a special reinforced concrete inspector on the building as advised by the architects.

The report proceeds as follows:

The evidence shows that the inspector of buildings, engineer of construction and the masonry inspector in that district were at the building enough times to have ascertained whether such special inspector was on the work or not; to say nothing of the fact that daily reports were not being made to the inspector of buildings by such special inspector.

On the subject of concrete construction the commission says:

Your commission finds, from its investigation, no reason to condemn the use of concrete in combination with steel for the structural parts of buildings; provided, the concrete is composed of proper materials, accurately measured and thoroughly mixed; the steel of sufficient strength and properly placed; the work installed by competent contractors and workmen, and the specifications, drawings and construction prepared and executed under the direction of competent designers and inspectors.

The commission was composed of able and unbiased engineers and architects and the report merits study and consideration. The failure was one of workmanship and not of material.

Preservative Treatment for Poles

In compiling statistics of the use of poles in recent years the forestry branch of the Department of the Interior reveals the extent of a rapidly growing demand for one important line of forest wealth. The total number purchased was 782,841, an increase of 118 per cent. over 1909. The total value of these poles at the point of purchase was $1,043,874, and the average price was $1.33, or less by six cents than the price per pole in 1909. Steam railways, telephone, and telegraph companies used 95 per cent. of these poles, the remaining 5 per cent. being used by electric railways and power and light companies. Of the total consumption 97 per cent. were cedar poles, which for their cost give better service than any other wood. At present none of these poles are treated or preserved by any method, in which respect Canada is not abreast of the times.

The Railway and Marine World, in commenting on this growing demand, strongly urged the adoption of preservative treatment. In the United States, where 3,738,740 poles were used in 1909 at a cost of $1.98 each, it has been found profitable to adopt preservative methods. During the last three years the treatment of poles has advanced so rapidly that in 1909 15 per cent. of the total number were treated by creosote or other methods. This is an increase of 67 per cent. over the number treated in 1908. At present the United States has 87 pole-treating plants, while Canada has none. Pole users in Canada should take up this cheap and rational method of securing greater service from the poles used, thus lessening the drain on our forest. The conservation of resources is a growing necessity.

Regarding the advisability of limiting the height of buildings in Edmonton to six storeys, Mr. H. M. Martin states the following:

"At the convention of building owners and managers in Cleveland there were men who represented an investment of three billion dollars in large buildings," said Mr. Martin. "The concensus of opinion among these men seemed to be that buildings twenty storeys or more in height were as satisfactory from the point of view both of the owners and the occupants, as lower buildings. The presidents of the building owners' associations from Cleveland, Detroit, Seattle and Chicago all favored 20-storey buildings as being the most satisfactory from every point of view. Some were of the opinion that it would be a good thing to limit the height of buildings to 160 feet, but none would have the limit placed at anything less than that height."

Methods of Ordinary Building Operation

The Design and the Erection in Relation to the Owner, Architect and Contractor—The Success that One May Expect in the Capacity of the Other

By W. B. Bamford*

All building or engineering operations are divisible into two parts.

(1) The planning and designing of the structures, and

(2) Their constructing and erecting.

Each of these divisions is separate and distinct from the other, and is governed by different conditions. The fact that, in the majority of modern work, the planning and erecting are so inseparably merged has caused the guide marks of proper procedure to be almost lost and obliterated. This has resulted in mistakes or inconsistencies which have caused needless trouble.

The methods followed in the planning and erecting of buildings are now going through a transition period. It seems, therefore, unwise and inexpedient to attempt to treat the erecting entirely independent of the planning, because, by such a limitation, it would be impossible to forcibly bring out many of the defects of the present practice which are due to lack of a correct understanding of the possible lines of cleavage between planning and erecting.

There are many possible business relationships which can be made for the planning of work and also for its erecting. Each variation is subject to certain restrictions and limitations. There is no one of these possible relations that will be satisfactory for all kinds of construction work; nor is there any particular kind of work which can be undertaken under all the different relationships. It is necessary, therefore, to understand the advantages and limitations of all the possible methods for planning and erecting buildings, and then select the one which should be the most satisfactory for the particular work in hand.

Dependent on Circumstances and Efficiency

The selection of any method for the planning or erecting of a particular piece of work should be controlled by the relative efficiency of the method in the light of the circumstances surrounding the particular work. There are, of course, certain theoretically desirable situations, and the mistake is often made in devising hypothetical assumptions in order to substantiate the advocacy of any particular method. The acid test of time and experience ignores everything but facts, and views efficiency in the light of results under the conditions as they actually existed.

It has already been pointed out that, in nearly all walks of life and in all countries, radical changes are in progress at the present time. The new spirit of practical efficiency will more certainly judge the actual results obtained, and methods must undoubtedly give way or be modified where they do not conform to the correct standard of true efficiency.

In order to concisely present a general view of the various possible methods for the planning and erecting of buildings, the following outline is given. These are divisible into five general methods:

D planned by	A Owner	1 Personally 2 By organization
	B Professional Adviser	3 Engineer-Contractor or building corporation
	C Contractor	4 Professional adviser employed contractor

D A1—Where owner personally plans his building.

D A2—Where building is planned by owner through his organization.

D B —Where building is planned by a professional adviser for the owner.

D C3—Where building is planned by an "engineer-contractor" or by a "building corporation."

D C4—Where building is planned by a professional adviser who is employed by the contractor and not by the owner.

Planning and Designing of Buildings

All work must be conceived and planned before it can be erected. The planning of work is an entirely separate and distinct operation from the erecting, but this fact is often forgotten because, in many cases, they are almost imperceptibly merged into a continuous operation. The planning of buildings may be done (a) by the owner, (b) by the contractor, or (c) by a person employed by an owner or contractor because of his special qualifications, and hereafter called a professional adviser. The professional adviser may be called an "architect," "engineer," "consulting engineer," "chief engineer," etc.

Owner as Planner of Buildings

(D A1) An owner may personally plan his own building. This is done in the case of architects who plan and design their own residences, etc. How many architects will testify to their entire satisfaction with such method? If an architect cannot satisfy himself in the plan and design of his own residence, what can a mere owner, who is presumably less able, do? Much personal mortification and many family jars would surely be eliminated if a law were enacted by the Congress absolutely prohibiting, under pain of death or banishment, any architect from planning and designing his own buildings.

(D A2) Many states and municipalities, public bodies, and corporations have a permanent staff and organization for planning and designing their architectural and engineering work. This is one of the most usual conditions met with at the present time.

Where the volume of work handled is of sufficient amount to keep at least the skeleton of such an organization busy at all times, this method can be made efficient by a proper executive staff and organization. If the amount of work handled is not constant enough to keep the skeleton organization busy at all times, then it may become less efficient than an independent professional adviser who is employed only when required.

---

*Condensed from a paper published in the Journal of the American Society of Engineering Contractors, June 1911

In states, municipalities, and corporate bodies, practical politics play such a demoralizing part that the true efficiency of any method has been a difficult matter to determine. The modern spirit of efficiency is, however, fast overthrowing the old barriers of party politics and a new era is dawning in even our political life.

Professional Adviser as Planner of Buildings

(D B) The independent professional adviser is (together with D A2) one of the most common means employed for the planning of buildings. The reasons for his existence is due solely to the fact that much work is done for parties who do not have sufficient work to justify their employing a permanent staff or organization to handle their work; and they, therefore, employ the independent professional adviser when occasion requires.

Ability is the same under whatever name the possessor may operate. If men with the proper ability are members of an executive staff of a public body or corporation; if they are in the service of a contracting organization as hereafter outlined; or if they are in independent practice, they can still exercise their ability. The question, therefore, becomes—by what method can the most efficient results be achieved?

The speaker believes that, where possible, the independent professional advisers should be the most efficient, but, if they would hold their places, they must prove their efficiency. It is hoped that this summary may prove of some assistance in directing investigation along the proper lines.

Hereafter some of the shortcomings of professional advisers will be pointed out.

Contractor as Planner of Buildings

(D C3) The "engineer-contractor" and the "building corporation" have made rapid strides recently in abrogating to themselves the functions of the professional advisers. They have made such successful progress that the American Institute of Architects in 1907 felt compelled to set its seal of disapproval upon such practice. In 1908, however, a new committee took a little broader view of the situation and recognized that architects themselves were not blameless for existing conditions, that condemnation alone was inadequate to stay the movement, that the only sure way of combating such tendency was by showing that the innovation offers no greater efficiency than can be obtained from professional advisers and has inherent disadvantages.

It is, of course, understood that the "engineer-contractor" and the "building corporation," to be successful, must have within their organization men who are capable of performing the work which can be done by professional advisers.

(D C4) The practice is not new of a contractor dealing directly with an owner, and then the contractor, and not the owner, employing a professional adviser to plan and design the work the same as he employs mechanics to execute such work. Several firms in New York City have been successfully doing this very thing for a number of years, and a number of prominent firms of architects have been kept busy working for these contractors.

Both D C3 and D C4 are seriously threatening the independent professional adviser. These methods have already done inestimable good in awakening professional advisers to their shortcomings, and causing them to begin to repair their defective fences. This alone is a most encouraging sign and much good should come of it.

There is another important situation which occurs when the contractor is also the owner and plans the work. This will be reviewed later.

Methods for Erecting Buildings

Buildings may be erected (a) by an owner, (b) by a contractor, or (c) by a combination of owner and contractor. The contractor may furnish the labor and materials or only the labor; the material being supplied by the owner. The following are the possible variations:

E Erected by
- A Owner
- B With assistance of professional adviser
  - 1 With own organization
  - 2 By day labor
  - 3 By employing trade contractors
    - a Unsecured cost contract
    - b Secured-cost contract
- C Contractor
- D Constructor who is also owner
  - 4 General contractors
  - 5 Engineer-contractor or building corporation

This gives thirteen methods which may be followed:

E A1 —Where erecting is done by owner with his own organization.

E A2 Where erecting is done by owner by day labor.

E A3a—Where erecting is done by owner with trade contractors under an "unsecured-cost" contract.

E A3b—Where erecting is done by owner with trade contractors under a "secured-cost" contract.

E B3a—Where erecting is done by owner, with assistance of professional adviser, with trade contractors under an "unsecured-cost" contract.

E B3b—Where erecting is done by owner with assistance of professional adviser, with trade contractors under a "secured-cost" contract.

E B4a—Where erecting is done by general contractor, under supervision of professional adviser, under an "unsecured-cost" contract.

E B4b—Where erecting is done by general contractor, under supervision of professional adviser, under a "secured-cost" contract.

E C4a—Where erecting is done by general contractor, without supervision, under an "unsecured-cost" contract.

E C4b—Where erecting is done by general contractor, without supervision, under a "secured-cost" contract.

E C5a—Where erecting is done by "engineer-contractor" or "building corporation," without supervision, under an "unsecured-cost" contract.

E C5b—Where erecting is done by "engineer-contractor" or "building corporation," without supervision, under a "secured-cost" contract.

E D —Where erecting is done by contractor who is also owner.

Owner as Constructor of Buildings

(E A1) When an owner, like municipalities, private corporations, etc., has a permanent organization, skilled in the kind of work to be undertaken, it is possible to consider the relative economy and efficiency of the owner erecting his own work instead of having it done by contract.

This is a very broad and interesting subject, and has been very extensively discussed. For public work this is the old question of public vs. private activity, so hotly contested in the discussion of municipal ownership and the trend of socialism.

In the case of building operations, at the present time, if the owner already has an organization competent to perform the proposed work, it may be more economical and efficient to utilize it than to employ a contractor. If no organization exists, a contractor should be more efficient and economical than assembling an organization for the work in hand unless the prospects of additional future work may make it advisable to organize a contracting department with the future as well as the present in view. Then again the work may be so large or novel that there is no contractor properly equipped to handle it, and a contractor would, therefore, have no immediate advantage, in assembling a proper organization, over an owner. This situation was one of the factors which finally determined the U. S. Government to construct the Panama Canal with an organization of its own rather than to undertake the work by contract as originally contemplated.

There is a different situation which occurs when the constructor is the owner .

(E A2) Whether an owner shall do his erecting with his own organization or by day labor is a question largely of whether there is an organization competent and free to handle such work. Whether the erecting should be done by day labor or by contract, presents a similar situation to D A1. An owner may have a permanent executive organization which could perform the required work by employing the mechanics needed. It then becomes a question of the efficiency and economy of day labor for erecting vs. contract work. This situation arises more frequently with municipal work than in building operations. Many municipalities have done work both by day labor and by contract, and the relative efficiency of the two methods is still a much debated subject.

E A3) Where work is planned by an owner or by his organization, as under D A1 and D A2, it may be economical for the erecting to be done by the employment of trade contractors rather than employing a general contractor. The owner would then be saving the profit of the general contractor and certain overhead charges which must be carried by general contractors. It may, however, be necessary or desirable for an owner to assume the same overhead charges as a general contractor. The owner's saving would then be only the profit of the contractor plus possible greater efficiency in erecting the work.

Owner as Constructor with Assistance of Professional Adviser

(E B) When an owner is not able or desirous of planning or directing the erection of work, either personally or through his organization, his alternative is to employ an independent professional adviser to supervise and direct the constructing, or to deal directly with a contractor.

When a professional adviser is employed, the work can be constructed either by a general contractor or by trade contractors.

(E B3) When trade contractors are employed, the situation is practically that of an owner erecting his own work by means of trade contractors, except that the professional adviser relieves him of the technical work of supervising and directing the erecting. Such a relationship presents some interesting practical problems.

Contractor as Constructor Under Supervision of Professional Adviser

(E C4) The usual method for erecting buildings is to have a general contractor as constructor. The alternate method of having trade contractors has just been set forth.

When an owner is unable or not desirous of erecting buildings himself, a contractor of some sort must be used. The question of this kind of contractor and form of contract must be matters for special consideration in conjunction with the particular work in question.

The usual practice in building operations, and the common popular understanding, is that the architect who plans a building will be the one who supervises its erecting. That this relation is not essential and is often modified for important work should be noted here.

It is possible, if architects confine their activities to the planning and designing of buildings and do not consider more carefully the economic side of the erecting, that some of the methods for erecting building may become popular where the architect is not an important factor during the erecting.

Contractor as Constructor Without Supervision

(E C5) There has recently loomed into view a horrible reality which is disturbing the peaceful sleep of many independent professional advisers. The "engineer-contractor" and the "building corporation" are the names at present given to these nightmares. They designate a contractor who is also qualified to perform the duties usually assumed to be the exclusive prerogative of the professional adviser. These contractors must, of course, have the training and experience of architects or engineers, or have such men in their organizations. They are, therefore, able to deal directly with an owner for work, and can arrange to plan as well as to erect buildings.

Under D C4 it has been shown that these contractors may and do employ professional advisers when required to plan and design buildings. As they deal directly with an owner for a finished product, they are in an excellent position to compete with the independent professional adviser, provided they can show a greater degree of efficiency in obtaining the finished result. In such a situation the architect is relegated to the subordinate position of a designer or draftsman for the work.

Architects have been too strenuously contending that their primary excuse for existing was to improve the artistic side of architecture! and, that contractors being commercially minded men, art must surely be damned in their hands without the guidance of the independent architect. The fallacy of this condition has been disproved by an analysis of the methods for erecting many of the ancient marvels of architecture or in observing the superior artistic excellence of many products made to-day by commercially minded concerns.

Under the following section an additional and most important position which contractors can occupy will be discussed.

Contractor as Owner

E D) There is a strong recent tendency for the building corporation to occupy the position of owner of the property until the building is finished, the ultimate owner being merely the purchaser or prospective purchaser of the finished product. This can be developed into a very satisfactory and business-like procedure, and conforms more correctly to the usual ideas of manufacture and sale.

The methods for obtaining prospective purchasers by a contractor-owner can be varied in several ways, some of which are clever innovations. Among them might be mentioned: where the constructor owns the land and arranges with a purchaser to erect a suitable building; where financing an operation and placing a mortgage is part of the transaction to induce a purchaser to deal with a constructor; where buildings are erected for sale with no definite purchaser before they are undertaken, etc.

These and various other alternatives place a constructor-owner in an important position to treat directly with purchasers who need not become actual owners until the building is completed.

Some will say that this method is not practical or that it can never seriously menace the present method for erecting buildings under the direct supervision of the professional advisers. That the method is practical is testified to by its successful use. Several New York firms have been doing a large amount of work for several years under what is virtually such a method, and the experiments and tendency of the large building corporations are in this direction.

Any method is dependent for its continuance on its efficiency. Of the old or new method, the most efficient will survive. The old method has not been satisfactory; it must be modified. Both the old and the new method have almost an equal chance; both may succeed and be used, or either one may ultimately supersede the other, depending on the practical efficiency of its operation.

The modern development of the constructor-owner is almost certain to bring about large building corporations who handle the entire work, and have an organization which is also competent to perform all the functions of the independent architect or engineer as well as to erect the work. Under such a constructor-owner an architect or engineer in independent practice might be employed, but he would usually be merely a designer and seldom have any connection with the erecting of the building.

The whole tendency of the constructor-owner movement is along the logical lines of economy and efficiency in the erecting of large buildings. The effect on architects will be to relieve them of any connection with the erecting of work and will confine their attention to the ministerial duties of the draughting room in the designing and planning of buildings.

The "speculative builder," "real estate operator," etc., are variations of the constructor-owner, and probably do 50 per cent. of the residential work throughout the country.

Architect as Contractor

Should the architect have a perverted idea of becoming a contractor, he should change his title and become a "contractor-owner," "engineer-contractor," common garden variety "contractor," etc., as already outlined. Therefore, we may omit consideration of an architect as constructor and not shock the sensibilities of those who contend that an architect is not a practical man, but an artiste; which would of course preclude the possibility of such architects becoming successful contractors.

Summary of Conclusions

The purpose of this paper is twofold. Firstly, to present a resume of methods for planning and erecting buildings; because, without a clear understanding of all the various possibilities it is impossible to compare the probable economy and efficiency of any method over its alternatives. Secondly, by outlining all possible methods for planning and erecting buildings, to offer a basis for more intelligent criticism of any method in the light of its relation to all other possible methods, and to facilitate suggestions for improvement in the details of procedure connected with such method.

Buildings must be planned and designed, and then constructed and erected. The properly planned and constructed building involves a proper knowledge and application of many various and varied subjects. This knowledge must be possessed and applied by men. A man is a man, whether he be called "owner," "architect," "engineer" or "contractor," and, if possessed of the necessary knowledge, fortified by homely honesty and common sense, it should matter as little to-day as it did in times past, by what title the planner or constructor is called, provided only, that the result is well and truly achieved to the best of his ability.

Vancouver's New Wharf

The C. P. R. wharf extension at Vancouver is the latest corporation work in progress in that city. Their two present wharves are at James Bay, nearly opposite the Parliament Buildings. The new dock is 250 feet in length, which, being an extension to the former dock, will furnish a length of 650 feet. The width of the earlier constructed portion is 90 feet, which will be increased to 120 feet.

The extension will be built upon piles, over a thousand of which are to be driven. Part of these, some 250 in number, are Australian turpentine hardwood and the remainder are the best British Columbia creosoted fir. These will be surmounted by a layer of 4-inch plank.

On top of the new wharf will be erected a freight shed with dimensions 500 feet by 40 feet, or an addition in length to the old shed of over 10,000 square feet floor space. Gangways, slips, etc., will be installed in the new sheds, which will be used for both freight and passenger effects in transit. This wharf will be the principal one used and the extension will cost some $35,000. The contractor for the work is Mr. E. R. Doe.

The Grand Trunk Pacific Railway are preparing to extend their line into Minneapolis and St. Paul and several branches are being surveyed down to the United States border.

Canada has a continuous waterway from the Atlantic to the head of Lake Superior, along which vessels of 14-foot draught may pass. The length is 2,300 miles, measured from Belle Isle to Fort William.

Railway Development in Western Canada

Consular Report of Unprecedented Construction on the Three Great Canadian Lines—Four-fifths of the Canadian Northern Line is in the West

In a recent report from Consul General Jones, of Winnipeg, the railway improvement in Western Canada for this season is estimated to involve the expenditure of $45,000,000, and the continuous employment of 30,000 men and 10,000 teams, and the accomplishment will be the construction of 2,800 miles of track.

At an early date two more railways will reach the Pacific coast in Canada—the Canadian Northern and Grand Trunk Pacific lines. The former, which is following a route said to have been the original proposed location of the Canadian Pacific Railway, will terminate at Vancouver; the latter will reach the Pacific at Prince Rupert, about 450 miles north of Vancouver. Besides these extensions westward the northward ramifications of the railway system include a line to Port Nelson, on Hudson Bay, two converging branches from North Battleford and Edmonton meeting at Athabasca Landing, and a line running up to within 40 miles of the fertile Peace River country. In Ontario there are to be constructed branches of important size entering the Thunder Bay Algoma district. Through southern Manitoba the Great Northern Railway will enter Winnipeg.

The three railways now traversing western Canada—the Canadian Northern, Canadian Pacific, and Grand Trunk Pacific—are vying with each other in extension work. The Canadian Pacific, the oldest of the three railroads, which already crosses Canada from coast to coast, is devoting its attention to double tracking its system. A review of the work of the three railroads underway and in contemplation follows:

The Canadian Northern

The Canadian Northern now operates a total mileage of 5,471 miles over the whole system, while 4,120 miles of this is laid in western Canada. The company announced that it would spend about $14,000,000 in construction work this year, laying 1,000 miles of new track and employing about 12,000 men.

This company is credited with making a careful selection of its territory and exercising discretion in regard to new town sites and the encouragement of building towns without unnatural boom. The close of the summer will see about 130 miles of new track completed by the Canadian Northern in the Province of Manitoba, including a line running up into a new territory between Lake Winnipeg and Lake Manitoba, where it is said 1,000 homesteads will thus be made accessible.

In Saskatchewan, the Canadian Northern is building 300 miles of new railroad, employing 2,500 men and 500 teams. One of the most important of the new line now under construction in that province is the Maryfield extension, to be carried through the coal fields to Lethbridge, Alberta. Another branch of considerable importance is the Jack Fish line, which is being constructed from North Battleford into the Peace River country, and has 18 miles of steel already laid and another 40 miles graded. Then, most notable of all, is the Hudson's Bay line of some 450 miles, running from Le Pas to Fort Nelson, which is being constructed by the Government and will be operated, it is thought, by the Canadian Northern. At present the contractors are busy on the bridge that is to span the Big Saskatchewan River.

In Alberta, the Canadian Northern will build 450 miles of line. On the Vegreville-Calgary line the track has been laid to a point about 14 miles beyond Red Deer River, while the grade has been completed to within sight of Calgary. This line, when finished, will make in all 200 miles of steel to be taken over by the company for operation this fall. Grading has been completed on the line to Athabasca Landing, and an outfit has gone out to commence laying the steel. The most important work being done in the province is that on the main line, which has been graded as far as the Pembina River. On the Canadian Northern line to Peace River, 100 miles is to be completed this fall.

In British Columbia the work is confined to the main line, which is being constructed from Vancouver eastward to the Rockies.

The work in Ontario includes many minor improvements in the Thunder Bay-Algoma district.

It is stated that the Canadian Northern route between Port Arthur and Nipigon is so close to the Canadian Pacific that it is probable an arrangement will be made by which the two companies will run their own trains over a double-track line.

The Grand Trunk Pacific

The Grand Trunk Pacific is spending $17,000,000 this year in constructing some thousand miles of new track. It is stated that 10,000 men and 4,000 teams have been engaged. There is keen competition between the Grand Trunk Pacific and the Canadian Northern as to which will first reach the Pacific coast. Up to the present the grade on the main line has been carried almost to Tete Jaune Cache, a point about 1,100 miles west of Winnipeg, while steel has actually been laid as far as Fiddle Creek, about 80 miles east of Tete Jaune Cache.

One of the most important branch lines which the company has under construction is that running 50 miles from Biggar to Calgary, where steel will shortly be laid. This branch will probably intersect the Edmonton-Calgary line a few miles north of the latter point, and when completed will offer the most direct route between Winnipeg and Calgary. The richest territory tapped by the Grand Trunk Pacific is said to be that traversed by the branch running southwest from Dandurand, a point a few miles west of Edson and entering down in the Brazeau fields, so as to serve the Pacific Pass Coal Co. It is estimated that there are 400,000,000 tons of coal available in this district.

The Grand Trunk Pacific also contemplates a line into the Peace River country.

From Regina to the international boundary a 100-mile line is being constructed; and, as the grade work is almost completed, it is expected the steel will be laid this fall.

In the mountain section a regular service has been inaugurated to Vanarsdol, 100 miles east of Prince Rupert. The grade is well advanced for 140 miles farther eastward, and the company hopes to operate trains as far east as Aldemere this fall. Tenders will be requested shortly for the building of the 410-mile gap between Aldemere and Tete Jaune Cache, the link which will make the road complete to the coast. It is expected that the line will be thus completed by the end of 1913. An agreement was approved by the Prince Rupert city council on June 8 last under which the company was to give the city 100 feet of water front and certain areas for park and cemetery purposes; build a dry dock to cost $2,500,000; build a station and other terminal buildings to cost $1,000,000, and a hotel to cost a similar amount, in return for a fixed payment of $15,000 a year as to taxes, for 10 years. The board of railway commissioners has authorized the company to open for traffic its line from Prince Rupert easterly for 100 miles, the speed of the trains to be limited to 12 miles an hour. A contract has been let to a Seattle contractor for the construction of a concrete wharf and warehouse at Vancouver for the company's steamship business; and plans are under consideration for the building of a similar wharf and warehouse at Victoria.

The Canadian Pacific Railway

Recently it was officially stated that the Canadian Pacific Railway had 10,758.8 miles of tracks now, as against 10,270.6 in 1910. To this there is to be added in the present year 1,023 miles over the whole system, of which 897 miles are being built in single track. It is understood that the company intends to spend in the neighborhood of $12,000,000 in improvements and the construction of new lines in western Canada this year. A contract has been let for the erection of the station building in Regina, which is to be used jointly by the Canadian Northern, under the terms of an agreement between the two railways. The building will be three storeys high, with two wings, and is to be completed by May 1, 1912. The contractors started clearing the site on June 12. The proposal to build a car and other repair shops at some point in Alberta is under consideration.

The new lines include: Another branch for Lethbridge, Alberta; a line from Bassano to Langdon, Alta., looping the irrigation block; and a branch from a point 40 miles north of Taber, into Calgary. It is proposed to build a new station at Calgary, a new wharf on the Fraser River at New Westminster, and a large station and railroad yard at Vancouver, containing 180 miles of side tracks.

New Fireproofing Methods

One of the interesting features of the new City Hall in Chicago is found in connection with the method adopted for fireproofing different parts of the structure. For example, instead of fireproofing the columns with wire lath and plaster, they are fireproofed with 2 in. of porous hollow terra cotta, built 2 in. away from the extreme projections of the steel work, each course being wired on with No. 10 copper wire. The intervening space between the tile and the steel is completely filled with a rich Portland cement concrete grouting, poured into place. All pipes are only allowed to be set outside of the fireproof covering thus constructed, so as to make it impossible for these pipes to damage the fireproofing. The pipes are again protected against fire by another covering of tile.

The floor construction consists of 6-in. hollow segmental side construction tile arches, spanning the distance of about 10 ft. from beam to beam. The bottom flanges of the beam are protected with 2-in. hollow soffit tiles. Below this fireproof construction an additional fire protection is offered in the shape of a suspended ceiling of incombustible material. In the corridors the space intervening between the tile arches and the suspended ceiling is used as space for pipes. In this manner a double protection is afforded at the place where the heat will be greatest in case of fire.

Above the tile arches the beams are surrounded with 2 in. of Portland cement concrete. Cinder concrete is filled in on top of the floor arches up to a height of 4 in. above the top of the steel beams, and this construction will make it impossible for a fire to damage the top flanges of the beams. By introducing the segmental tile arch the dead weight of the floor construction has been cut down to a minimum.

July Building in Edmonton

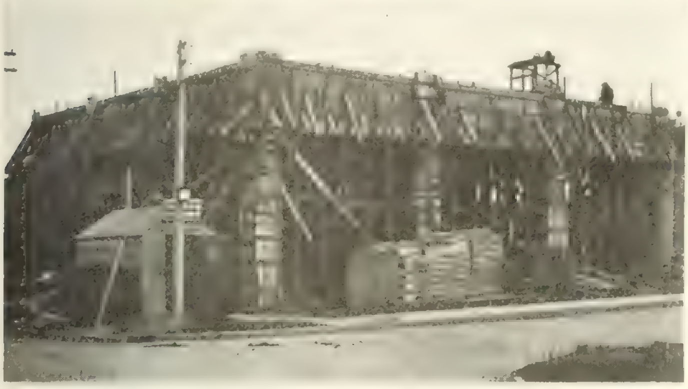
The demand for houses of residential type in the city of Edmonton shows no signs of abating and is unprecedented. Numerous permits are applied for each day for new ones, the builder knowing that he will be sure to sell the house long before completion. Numerous business blocks are going up and there is a pleasant tone of industry in all parts of the city. The big Tegler Block, the framework of which is up to the sixth storey, is to have an additional storey to the number originally planned, making seven in all. The first floor was let in a long lease prior to commencement of construction, showing the great opportunities the city offers in the way of building investment. Several large blocks are projected and we expect to have these applications in during the coming month. House rents are on the increase and cases are rare where a habitable house is vacant for even a week.

The total issue of building permits for the past month amounted to $474,909, which is an increase of nearly $15,000 over July, 1910. The total of permits issued this year to date amounts to $2,095,340, showing that in the city of Edmonton the building industry is playing a very important part among the others.

A novel method of building up cement piles or supports in quicksand is the subject of a German patent. A pipe of suitable size has at its lower end an auger point and a helical screw blade, several holes being driven through the wall of the pipe just above the blade to permit the discharge of cement grout outward. By water pumped through the pipe, the apparatus is twisted into the sand, jets being used to aid the sinking if necessary. When the required depth has been reached, the grout is pumped into the pipe and the drill is turned backward to withdraw it. Flowing out along the face of the blade, the cement becomes mingled with the sand directly above, and the turning screw passes the mixture to the space below. A cylindrical pile is thus built up in the semi-liquid sand. Others may be produced in the same way alongside the first, and these may be readily consolidated into very strong and substantial piers.

Local Type of Concrete Building

The Hamilton Gear & Machinery Company, specializing in cut gears and high grade tool and machine work, are erecting a building of reinforced concrete at the corner of Concord and Van Horne streets, Toronto. This structure is indicative of the extensive use to which reinforced concrete may be put, and although comparatively small in size, provides for extensions both in height and floor area in a very simple and convenient manner. The accompanying photographs are shown to give an idea of the work as it has developed week by week.



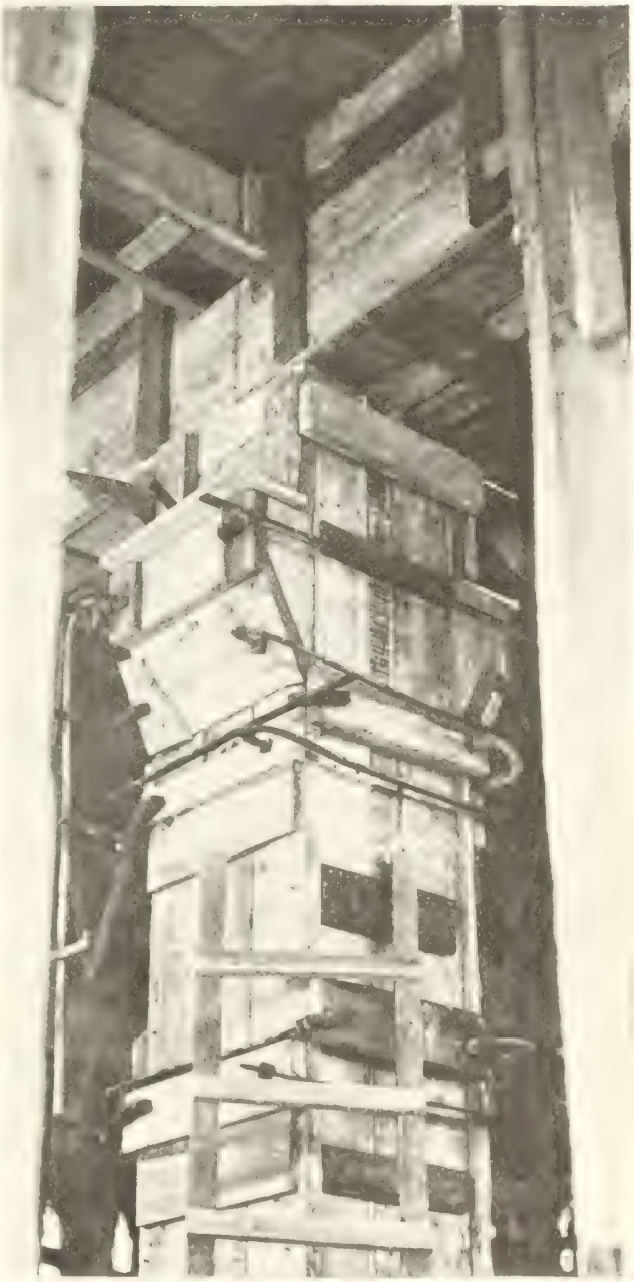
After five weeks ; first storey forms in place

The main beams are shown to run lengthwise of the building, while secondary beams cross them making three panels to each spacing between columns. This gives a maximum head room for crane work. The floor to ceiling distance is 16½ feet, while the crane just clears the secondary beams. The crane girders, which are 10 inch I-beams, are shown in the accompanying illustration to rest on heavily reinforced concrete brackets poured integrally with the columns. The reinforcement consists of ¾ in. smooth rolled steel rods bent as shown with a large arc contracting by 4-inch radius and projecting downwards for approximately 6 inches. These pieces are inserted in the concrete just inside the four vertical rods for column reinforcing, while more centrally located are two ¾-inch steel rods supplied at the ends with 2¾-inch washers as shown.

The crane girders themselves are bolted together by two ¾-inch tie rods on each side of the supporting column. The whole forms a very substantial support, of neat appearance and requiring but little space.

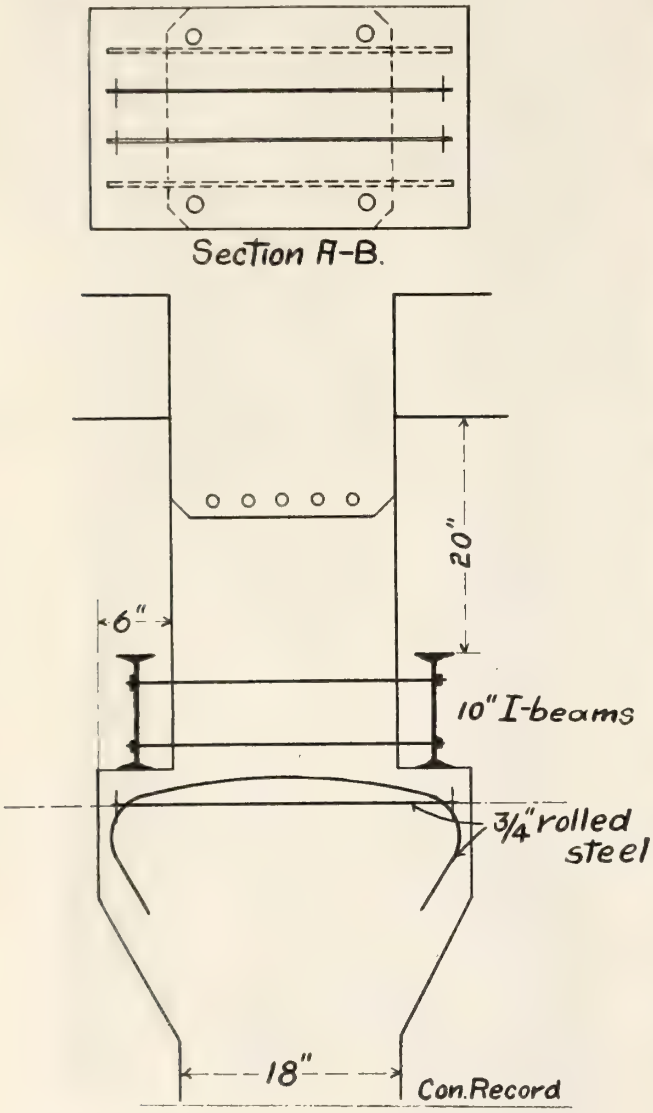
Building after removal of forms, showing window area

The line shaft for power transmission purposes is carried on post hangers bolted to the columns with the pulleys just clearing the crane girder and having intermediate journals carried on brackets of angle iron forming a centre to centre distance between bearings of 9 feet 3 inches. The four slabs, which at the present time constitute the ceiling of the first storey, are of 4½-inch concrete with .29 square inches per foot reinforcing spanning 5 feet 4 inches in the clear, and .07 square inches per foot temperature rods running lengthwise of the panels. The secondary beams are 10 inches by 18½ inches, deriving half of their strength from the T action of the end beams. The inside main beams resting on the columns are 18 inches by 34 inches, the columns themselves being 18 inches by 18 inches. The outer long beams and the corresponding beam across the end of the building are 14 by 48 inches. Only a small part of this depth of outside beam is below the ceiling, giving ample opportunity for high and large window area, the remainder of the beam extending upwards to form a parapet wall and



Pillar with crane brackets ; note removability of all forms separately, including beam forms finished off with the window sills of the future second storey, which will also be of concrete of corresponding design.

The floor contains 4½ inches of rock concrete, on top of which are laid 2 by 3 inch nailing strips with bevelled sides and 16-inch centres except 10-inch centres under the heavy machinery. The intervening space is filled with cinder concrete and an air space left to prevent future floor decay. The floor itself consists of ⅞-inch hemlock diagonally laid and covered with ⅞-inch maple. The windows on the sides of the building exposed to possible neighboring fires are all fenestra with wired glass. Approximately one quarter the window area in the building is of swing design for the purposes of ventilation.



Diagramatically showing peculiar reinforcement of crane bracket

The boiler room and blacksmith shop are in the same building, but are separated by a partition of 6-inch hollow tile and have cement floors, eliminating any danger of smoke and grit injuring the fine machinery in the other parts of the plant.

One of the photographs shows the arrangement of the joists and trimmer beams around the elevator shaft. Use is made of the same opening in the upper floor of both chimney and shaft, so as to eliminate unsupported portions of slab as much as possible. The temporary roof is surface graded with wet cinders rammed hard, and four inches of cinder concrete on the top, giving a surface pitch of three-eights of an inch to one foot, with the lowest point in the proximity of one of the centre columns, where a cement funnel leads to a cast iron pipe inside the boiler room clear of all crane ways. At present ordinary 4-ply felt and gravel roofing is laid on the top of the cinder concrete surface, the top of the slab roof being unfinished as the second floor will be constructed in a manner similar to the lower floor already described. The plant is just commencing operations and the first orders are being put through. Mr. A. H. Harkness is the designing engineer and the Bishop Construction Company the contractors.

Corner of ceiling, showing joists and trimmer beams

Users of reinforcing material will be pleased to learn that wire reinforcement has met with a progressive change of form which eliminates what has previously been a serious drawback. Owing to the fabric being shipped in rolls its tendency to curl during the process of laying has limited its general use. This has been regrettable owing to the fact that, for bonding, wire reinforcement is considered superior to any other material. It has been stated that the Page Wire Fence Company are now able by the use of special machinery to supply their wire reinforcing in flat sheets, thus getting rid of the curling tendency.

Building operations in Hamilton have this year exceeded anything previously reported. The industry has been very general throughout the city, and has included a large number of residences as well as factory buildings.

Proper Sizes of Culverts

At the present time practically all of the culverts are too small to carry the water that comes to them. The matter of the required area is one that has been given very little attention. When a new culvert is to be constructed, the township commissioners generally each make a guess as to the area required, and then agree by a majority vote as to what the size should be, which vote is largely determined by the amount of money that is available for a particular structure, or how many of the commissioners live in that neighborhood. There is no excuse whatever for this unbusinesslike guessing method, for the railroad companies have made accurate surveys of drainage areas and computed the run-off from the maximum rainfall per hour, and have designed their structures according to these scientific methods, and in most cases have had an opportunity to determine from practical use as to whether their computations were correct or not.

Drainage Areas and Approximate Areas of Waterways

Column D=Areas in square miles.
Column A=Areas of Waterway in square feet.

D	A	D	A	D	A
.01	2.0	4.8	443.0	60.0	1,650.0
.02	4.0	5.0	455.0	65.0	1,720.0
.04	7.5	5.5	483.0	70.0	1,780.0
.06	10.5	6.0	509.0	75.0	1,840.0
.08	13.5	6.5	533.0	80.0	1,900.0
.10	16.0	7.0	556.0	85.0	1,960.0
.15	25.0	7.5	579.0	90.0	2,015.0
.20	32.0	8.0	601.0	95.0	2,065.0
.25	38.0	8.5	622.0	100.0	2,120.0
.30	44.0	9.0	641.0	110.0	2,220.0
.40	56.0	9.5	660.0	120.0	2,315.0
.50	66.0	10.0	679.0	130.0	2,405.0
.60	74.0	11.0	710.0	140.0	2,500.0
.70	81.0	12.0	740.0	150.0	2,580.0
.80	88.0	13.0	775.0	160.0	2,665.0
.90	94.0	14.0	805.0	170.0	2,745.0
1.0	100.0	15.0	835.0	180.0	2,820.0
1.2	120.0	16.0	865.0	190.0	2,900.0
1.4	140.0	17.0	890.0	200.0	2,970.0
1.6	160.0	18.0	920.0	220.0	3,115.0
1.8	180.0	19.0	945.0	240.0	3,245.0
2.0	200.0	20.0	970.0	260.0	3,370.0
2.2	220.0	22.0	1,015.0	280.0	3,495.0
2.4	240.0	24.0	1,060.0	300.0	3,615.0
2.6	260.0	26.0	1,100.0	325.0	3,770.0
2.8	280.0	28.0	1,140.0	350.0	3,900.0
3.0	300.0	30.0	1,180.0	375.0	4,035.0
3.2	321.0	32.0	1,220.0	400.0	4,165.0
3.4	340.0	34.0	1,255.0	450.0	4,385.0
3.6	357.0	36.0	1,290.0	500.0	4,610.0
3.8	373.0	38.0	1,320.0	550.0	4,825.0
4.0	388.0	40.0	1,350.0	600.0	5,030.0
4.2	403.0	45.0	1,435.0	650.0	5,230.0
4.4	417.0	50.0	1,510.0	700.0	5,420.0
4.6	430.0	55.0	1,580.0	....	......

The factors entering into the problem of the probable run-off are the area of the drainage basin, the maximum rainfall per hour, the slope of the surface, the character of the soil, whether it is porous or compact, and whether it is cultivated or wooded. The accompanying table has been prepared by the Engineering Department of the Atchison, Topeka & Santa Fe Railway for the approximate areas of waterways for average drainage areas in eastern Kansas and Missouri, where the rainfall is about 35 inches per year. (Estimates for other sections of the country would be based on proportionate rainfall and comparative similarity or dissimilarity of soil conditions and topography affecting run-off).

It will be noted that a normal drainage area containing one square mile, or 640 acres, requires 100 square feet of waterway area. These figures can be very easily kept in mind, and waterways for drainage areas up to four square miles readily determined, even though the table containing the tabulated data is not at hand, by multiplying the area in square miles by 100.

This table contains the most reliable information yet available. Since the drainage basins have been carefully surveyed, and records of the maximum rainfall kept, and the structures designed from this data have been in practical use for a number of years, such information is of inestimable value, and the areas of the waterways given here are as nearly correct as it is possible to learn at the present time.

In the construction of new culverts, this table should be carefully consulted after the drainage area and the character of the slopes and soil have been determined. It should be remembered, however, that these waterways are for average drainage areas.

A large riveted steel stack has been recently erected in Cleveland, Ohio, at the foot of East 70th street, for the new power house of the Cleveland Electric Illuminating Company, where it will serve 18 boilers of 600 h.p. each. The height of the stack alone is 216 feet, which is increased to 275 feet by the structural supports. The outside diameter is 22 ft. at the top and 40 ft. at the base where it flares out like a bell. The diameter inside the brick lining is 18 ft. 6 ins., the same from top to bottom. While it is not the highest in the world, it is claimed by the builders, the James McNeil & Bro. Co., of Pittsburg, Pa., that this is probably the largest steel stack, considering both height and diameter. The weight of material in the stack proper, not including supports, is given as 400,000 lbs. A total of about 30,000 rivets was used in its construction.

Four different thicknesses of plates are used in the stack walls, decreasing by sixteenths from 7/16-in. thick at the base to ¼-in. thick at the top. Each thickness of plate is used over a length of from about 35 to 55 ft. of the stack. The brick lining extends from top to bottom, varying in thickness from 26½ ins. at the bottom to 4 ins. at the top. Its thickness is decreased by steps of several inches each at intervals of from about 30 to 55 ft. The breeching opens into the stack at two points directly opposite each other. The openings are 13 ft. square. The stack is held to its foundations by 14 anchor bolts each 10 ft. long by 2 ins. in diameter. At both ends of each bolt a length of 6 ins. is upset to 2½ in. diameter for threading. Four similar additional bolts, each 6½ ft. long, are used at the foot of the jamb posts of the breeching portals.

Since the first laying of bitulithic pavement in Toronto, about ten years ago, there have been upwards of 400,000 square yards put down in this city. Some of the good qualities that have made themselves evident are economy in cleaning and repair and a rough surface that is favorable to motorers and drivers.

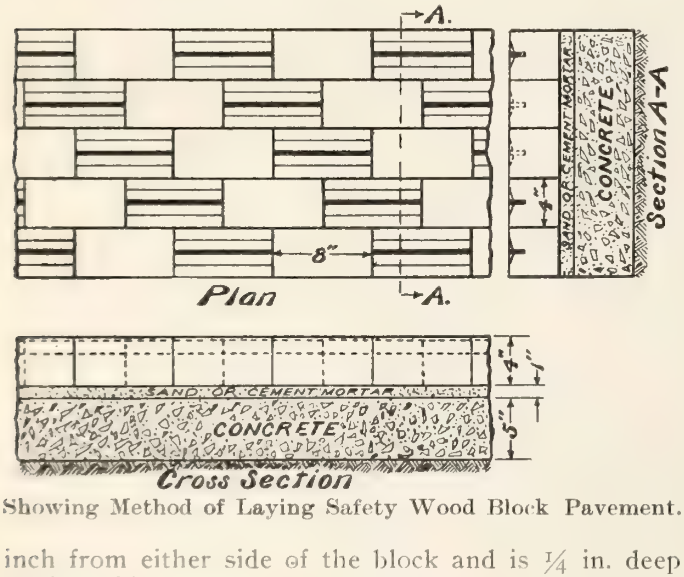
A New Wood Block Pavement

A wood block pavement of unusual construction, which is designed to overcome the slipperiness incident to ordinary pavements of this material, has recently been brought out.

Each of the materials used for paving has certain well defined advantages and disadvantages which make the selection of the kind to be used on any given street a matter of judgment as to what qualities are most essential in that particular case. Treated wood blocks have been used extensively in city pavements, in some cases, as in New York city, for example on thoroughfares carrying the heaviest commercial traffic. One of their greatest merits is noiselessness, while at the same time they have the disadvantage of being slippery when wet. Most of the adverse criticism to which wood block pavement has been subjected has been on this score. As a consequence, its use has, in the past, been limited to streets having comparatively light grades.

The new pavement is designed with the view of eliminating the slipperiness, and, therefore, making wood blocks available for the paving of streets with heavier grades than those on which wood is now used. It is intended, at the same time, to preserve the noiselessness and other advantages possessed by the material.

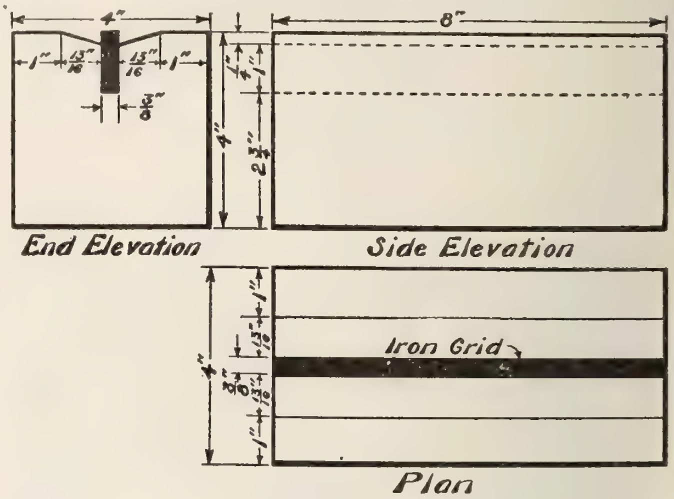
In order to secure the desired result a special block is used. This block, which is shown in one of the accompanying sketches, is 8 inches long, 4 inches wide and 4 inches deep. It may be made of any of the varieties of wood commonly employed for the manufacture of paving blocks, and treated by any of the usual methods. The top of the block is grooved as shown, and an iron grid inserted in the middle of the groove. This grid is ⅜ in. in width and 1¼ ins. in depth, and extends the whole length of the block. Its top is flush with the top of the block. The groove begins one inch from either side of the block and is ¼ in. deep at the grid.



Showing Method of Laying Safety Wood Block Pavement.

In the construction of a pavement, the special blocks and ordinary blocks of the same size are laid as shown in the second sketch. The blocks are laid across the street at right angles to the curb lines, each alternate block being a special. As the blocks in adjacent rows break joints by half the length of a block, a longitudinal section (as A-A in the sketch) shows two specials alternating with two regular blocks.

In the sketch, the blocks are shown resting on a 1-inch sand or cement mortar bed on a 5-in. concrete foundation. This construction may, of course, be varied, and the pavement laid according to any specifications for foundation and cushion. Any desired filler, also, may be used.



Showing Special Block Used in the Safety Wood Block Pavement.

Work on the Guelph sewage plant is making excellent progress and it is expected that everything will be completed for operation in a few months. The six new beds, of which three are completed, are being constructed directly north of those now in operation. A layer of broken stone is first laid in the bottom. This is covered by a layer of crushed stone, which is followed by layers of three different grades of gravel, all being covered with a coating of sand. About 500 loads of gravel are required for each bed. The sewage is conveyed by pipes to wooden troughs which extend lengthwise across the centre of the beds, where it flows out spreading over sand and gravel through which it filters into a covered drain, from which it is run into the river. The sewage farm will be operated on the intermittent system.

Considerable difficulty is being experienced in the construction of the Strathcona intake pipe owing to the swift and deviating currents in the Saskatchewan river, especially during the spring and early summer months. The winter season was considerably advanced before the contract had been awarded, and owing to the necessity of removal of a large quantity of ice it was found impossible to instal a pipe before the spring break-up. The city engineer later undertook the work by day labor, but after laying about 90 feet of the pipe at great expense, the intake had to be abandoned until ice begins to form on the river next winter, when an attempt will be made to lay the additional 330 feet of pipe line. In the meantime the three sections of pipe already laid remain unused.

The Union Trust Company of Winnipeg are about to build at the corner of Lombard and Main streets, test foundations if rock is too deep to allow of making a sufficiently strong foundation, the builders will put a pedestal pile foundation and will consist of twelve stories, first two of granite and remainder of terra cotta.

The Extras and Omissions of Contracting

Where Quantity Surveying Eliminates a Host of Difficulties—Written Orders Should Feature every Alteration—Day Work Prices

The term "variations" has a different significance according to the point of view from which they are looked at. From the one point "additions" are the characteristic features, and from the other, "omissions." The foreman generally does not beat about the bush, but designates them boldly "extras;" but in an article on the subject, The Builder, London, deals with the term literally, as there are few contracts where items to which both terms apply do not occur.

If all contracts were carried out strictly to the letter, as far as procedure is concerned, and given a good bill of quantities consistently priced, this should not be a troublesome matter, but this premises a good set of drawings and full details prepared at the outset, a full specification, every order for a variation given in writing—how often is this precaution omitted and with what unfortunate results—day-sheets, verified by the clerk of works, and sent in week by week, and a careful record of all work covered up, agreed to as correct by the contractor or his foreman and the architect or the clerk of works, or else measured by the surveyor during the progress of the work. Such would be the ideal condition of things; but we are afraid it is not the lot of many surveyors to find such an ideal condition when proceeding on to the works to take up the meaurement of variations.

The Pricing of Quantities

Looked at from the surveyor's point of view, it is presumed that he prepared the original bill of quantities, so that there will be nothing to find fault with on this head. We must—if only as a matter of courtesy—reckon that the drawings and specification are all that can be desired, so that eliminates another element of trouble. We then come to the question of pricing—the question of ascertaining what are variations and the measurement of same we will leave till later. What a fruitful source of difficulty the inconsistency of pricing that occurs in so many bills of quantities occasions. The "slips" of pricing "feet" for "yards," "yards" for "squares," and vice versa, one is continually running across, and there are great possibilities in this direction. Then those misreadings—to name a few of which have come under our notice. "Half brick walls in cement," at ½d. per foot on the supposition that the item is an extra over the bulk brickwork for building 4½-in. walls, although nothing was said to this effect. Another striking instance was an item of stone facing which was priced as "extra over brickwork," although the note "labor and materials" was put at the end and also underlined. This worked out on the variations as an extra cost. The builder, however, content with his good fortune in having saved some of his loss, did not press for the extra, although under the contract we do not think there is any doubt that he could have done. Still another. A client decided to have corrugated iron roofs to some large sheds in lieu of slating and boarding, and, being in fear of prices being "faked" as he termed it, refused to have the matter gone into before deciding (the priced quantities being sealed). He found at the end that he paid more for the corrugated iron than he would have done for the slating and boarding owing to the high price of the former and the low prices for the latter in the contract. These examples could be multiplied indefinitely, but those we have given are sufficient for our purpose. The question arises as to how far it is permissible to deal with the prices after the tender is accepted, but before the contract is signed. It is obviously unfair to other competitors to allow the contractor whose tender is accepted to make any addition to his price. On the other hand a contractor may reasonably object to reduce his price. The fairest method, therefore, is to examine the prices beforehand, rectify obvious errors, and, if they make any appreciable difference to the total, to treat this difference as a percentage on the prices (as an addition or omission, as the case may be) in the final settlement of the accounts. This method eliminates one element—that of inconsistent pricing—that is often a cause of trouble. Where this procedure has not been followed our experience has been that in a friendly settlement of accounts neither side holds to the strict letter of the contract, but brings into play a wise discretion. On the one hand the client does not insist upon the contractor executing extra work at what may be a ruinous price, and on the other the contractor does not ask to be paid an obviously excessive price for extra work, notwithstanding the fact that he could claim such under the contract. Of course, this could not apply generally, but only in such cases as we have given examples of. It may be considered that this is establishing a dangerous precedent, but we have found in practice that, so far from causing complication, the result is quite the reverse, and it is obvious that this course is only possible where there is mutual confidence such as ought to obtain—and we are happy to believe does obtain—with any extended business relationship. In those cases where either party approaches the business with the object of scoring off the other, the only course open is to stand strictly by the letter of the contract and each fight his own battle. It then becomes a case of "diamond cut diamond."

We have dealt somewhat fully with the question of inconsistent pricing, perhaps more fully than some may consider the importance of the question warrants, but we think that most contractors and surveyors have frequently been faced with the difficulty of arriving at a fair result when these discrepancies occur. We have, therefore, given the results of our experience extending over many years and under varying conditions, and we venture to hope with satisfactory results to all parties, to be considered for what they are worth.

How Variations Should be Dealt With

The question of ascertaining what are variations now claims our notice. If the architect is careful to have every variation ordered in writing, the procedure is simple, and contractors would be well advised to ask for this, or, at any rate, to confirm in writing such orders if given verbally. Much trouble will be saved by this precaution, as such confirmation, in the absence of any protest from the architect, must necessarily be strong evidence for the surveyor to act upon. Some architects hand their surveyors all the correspondence relating to the work to be examined and notes made, so far as the letters relate to the question of variations, and we have found this works well. Where the architect keeps an order book for variations, the orders, of course, are unmistakable evidence, and unless he receives special instructions from the architect no surveyor would deal with any claim for a variation raised by the contractor, unless he could produce such an order. We would therefore strongly urge both parties to a contract to see that every order, whether for extras or omissions, should be in writing in some form or other.

We think it is generally agreed that the bills of quantities should form part of the contract in fairness to all parties. In practice we generally find this is accepted (although there are notable exceptions in the case of some public bodies), whether it is so stated or not. A good deal of discretion should, however, be exercised by both parties as to how far this should be carried, and it is, of course, obvious that it may cut both ways. The contractor who adopts a policy of "grab" by raising every little question may find himself met with items which far outweigh any claim he may make under this head. On the other hand the surveyor who either from incapacity or carelessness leaves many openings for such claims deserves all the trouble that falls upon his head, and the architect who finds himself involved in difficulties (because, after all, the architect is often the one to suffer) would do well to select another surveyor.

The Measurement and Pricing

When measuring variations it is most essential that the system adopted should be identical with that of the original dimensions. The pricing will then be found quite a simple matter. It is a good system to keep each item separate regardless of the form of the final account, as it is easy to afterwards group items together in the final summary of accounts.

The pricing, to those who are conversant with the subject, should not be the debatable matter that it often is, but "trying it on" on either side is reprehensible—waiting to see what the other side will say instead of naming a fair price and sticking to it. In the case of a well-priced bill of quantities there should be very few debatable points on this head, as it ought to be easy to make up new prices from those of the contract. We say should be, but we are afraid that there are more bones of contention over the question of pricing, owing to inconsistency and want of method, than over any other portion of the work.

The question of day works has been, and probably always will be, a vexed one. These should be kept carefully and signed for by the clerk of works as correct, but it should be distinctly understood that in no case should the signature of the clerk of works be construed into either an order or even an undertaking that the item should be treated as day work, but simply as a record of the correct time and materials, leaving it to the discretion of the surveyor as to whether the item should be measured or accepted as day work.

Theoretically in many cases there should be no discrepancy between the price for work on a day-work basis and that on a measured basis, but we are afraid this state of things is the exception rather than the rule. It has always been our experience that where this theory has been accepted by the contractor, there have been fewer grumblings at losses than where there has been the attempt to get day work adopted at all costs, and we are speaking of contractors', not individual works. Where the contractors have accepted this theory we have found a perfect system of business in every deparment—good bookkeeping, good supervision, good feeling, consistent pricing even in competitive works, and evident prosperity. We emphasize these points so as to remove the possibility of a charge of slackness or generosity on the part of such contractors.

Although in most cities there is a general schedule of day-work prices arranged between the local institute of architects and the institute of builders, we do not think these should obtain in those cases where the price for materials are inconsistent with the prices for labor and materials in the bills of quantities, although some contractors contend that these schedules override the bills of quantities. It is, however, surprisingly rare to find it absolutely impossible to measure work if the surveyor is really competent. That, at least, has been our experience.

We have dealt with the subject, taking as a basis an ordinary competition on bills of quantities, that being the more common procedure in works of any size. In those cases where the contractor is paid a percentage on his cost there can be no question but it should be clear as to whether the cost is to include establishment charges or not, as doubt on this point often leads to trouble. We have emphasized the question of pricing as it is so often on this question that the settlement turns. If trouble arises from unbusinesslike action on the part of either the architect or contractor, or the before-mentioned policy of "grab," then we are afraid there is no system to satisfactorily meet the case, but we would again impress upon contractors the necessity of careful pricing and good bookkeeping and supervising. The latter would stop many wastages and leakages that so often occur, and which sometimes turn a profit into a loss, while the former enables the contractor to obtain all he is entitled to, and such being the case the work should show a profit.

So much has lately been said upon the subject of specialists, and the supply of special articles, that we do not propose to deal with this question beyond suggesting a sharp look-out as to the charges for carriage and packages, and also the credit of returned packages, which is often a much larger matter than at first appears.

In no other country in the world, it is asserted, are there such vast, varied, and valuable deposits of gypsum as in Nova Scotia. The exposures show beds of from a few feet to hundreds of feet in thickness, ranging in color from gray to snow white, and frequently of the best quality. Some of the deposits have been worked for nearly a century, but during all this time only two mills have been established for the manufacture of gypsum products. The production of gypsum rose from 300,000 tons in 1908 to 322,974 tons in 1910, practically all being sent to foreign countries.

Hot Country Methods

The placing of concrete work in countries with arid climates calls for very careful calculation of the proper amount of water to be used in both the mixing and curing operations. In many countries where cement is now being used the thermometer is known to register above 100 deg. F. for the greater part of the year and for several months of the time it ranges daily from 106 to 115 deg. F. Referring to the manufacture of cement pipe to illustrate the water requirements and rapidity of cement setting, a writer states that even where sufficient water is used in the concrete to bring the web-like water marks to the outside of the pipe during ramming, the pipe will require and takes in the water from 20 to 30 minutes time after it is made, and will withstand a hose pressure, full force, equal to 25 pounds per square inch in from three to four hours' time thereafter. As to gain in strength due to rapid setting with a 1:5 mix of well proportioned sand and gravel, it is possible to make three pipes upon the same ring within nine hours. This necessitates the removal of the ring from two of the pipes during one and the same day. At the end of two weeks' time, however, the cured pipe will withstand repeated severe blows delivered upon the side of the pipe wall and at right angles to the pipe access, from a ¾-inch iron pipe sufficient to bend and flatten the same without any injury to the cement.

In the building of cement pavements general practice is to place the concrete base of a slushy mixture upon a well wet down sub-grade, using in the mixing all the water that the mixture will carry without reducing the specific gravity below the point where the gravel will still be held in suspension in the mortar, and without using sufficient water to produce the first appearance of white streaks which foretell a condition that will result in laitance if more water be added. The evaporation is so great that by the time some 50 square feet of this machine mixed base of 1:7 concrete has been placed 4 inches thick and rodded off, the first half of it will be in a proper condition to be rammed down to a thickness of 3½ inches.

This base is followed as closely as possible by a half inch wearing surface composed of one and one-half parts sand and one part cement, mixed with sufficient water to render the mixture sloppy. A finisher and helper must be accurate to edge, mark off and finish the top coat in time to catch the moisture as it goes down and not resort to sprinkling. In the building of a cement walk as described above, the rapid evaporation takes out all excess moisture and the proper floating and troweling gives density and a lasting bond is secured. With forms already in place seven men will lay and finish 2,000 square feet of 4-inch walk in a working day of nine hours. After finishing, the practice is to cover the walk with moist earth as soon as possible and follow by a thorough sprinkling on the same day. together with a heavy covering of wet earth and a good water-soaking daily for the next week or more.

It is stated that under the conditions of the intense heat of some arid countries the strength of concrete attained in a fortnight will equal the strength of concrete attained in the damp and cool climates in a 30-day period of any time of the year.

New G. T. R. Hotel, Winnipeg

The accompanying illustration shows an architectural perspective of the new magnificent new Selkirk Hotel building that the Grand Trunk Pacific Railway Company propose erecting in Winnipeg. The construction will be fireproof and the interior is to be finished in marble, cane stone and mahogany, while the exterior will be buff brick, with facings of cut stone. When finished the Selkirk is expected to be the handsomest and most luxurious hotel in Canada. Messrs. Ross & McFarlane, of Montreal and Winnipeg, are the architects. They have recently opened an office in the latter city, having consolidated with Herbert B. Rugh, who will be in charge of the erection of the building. Tenders have been received, and ground will be broken for the excavation immediately after the letting of the contract.

Proposed Hotel Selkirk.

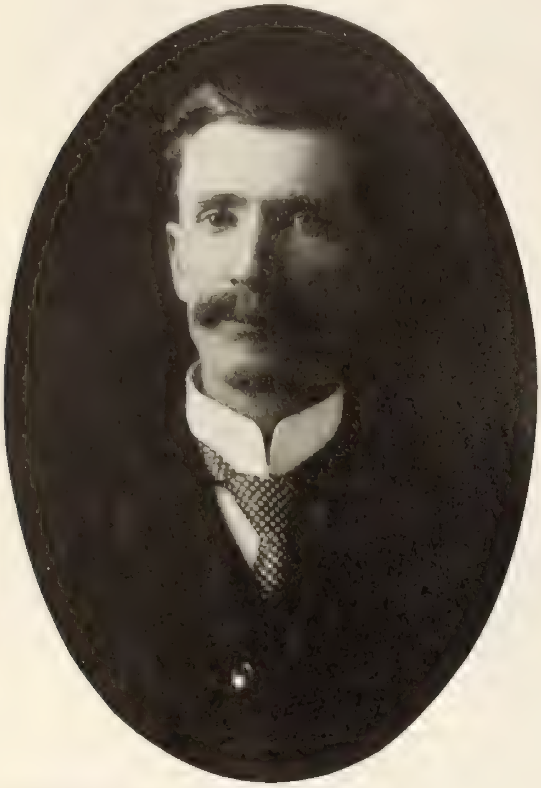
Slate for Flat Roofs

The main uses of slate at present are for overlapping roofing, suitable for laying only on a sloping roof; and this immediately sets a limit on its use. In many classes of buildings, such as residences, churches, or public structures, sloping roofs are highly desirable, whether for ventilation, increased space under cover, or architectural effect. But in other buildings, such as factories and city structures in general, flat roofs are imperative. The application of slate to flat roofing manifestly opens up great possibilities. This has now been made in what is known as inlaid slate roofing, not by any means an experiment, but a roofing that has been laid on many buildings with a high degree of success.

Because of the peculiar climatic conditions prevailing in the Canal Zone on the Isthmus of Panama, resulting in rapid deterioration of rock-cut faces on exposure to the elements, the experiment will be tried of protecting rock cuts by coating them with cement.

The St. John, N. B. Builders' Exchange

The Builders' Exchange of St. John, N.B., is a live organization in the eastern province, and has been very heartily and largely responded to by the leading contractors and builders in and around the city. This year it has for its president the Hon. Robert Maxwell, M.P.P., while Mr. Chas. F. Stevens is the secretary. The membership of the Exchange includes the contractors in almost all the many branches of work going on in the city, masons, carpenters, plumbers and heaters, painters and decorators, sheet metal workers, roofers, house raisers and movers, as well as general contractors, form a greater part of the list. The organization is rapidly getting into working order and is this year devoting considerable attention to unfair and profitless competition among builders, as well as innumerable other existing and short-lived evils that are constantly presenting themselves for ratification.



Hon. Robert Maxwell, M. P. P., President, St. John Builders' Exchange.

Bridge of Immense Single Span

A new bridge is being constructed across the Spokane River in Spokane. This will be the largest single span of reinforced concrete in America, at the time of its completion, which will be early in October. The central span is 281 feet, or 12 inches longer than the bridge over the Rocky River, in construction at Cleveland, and 58 feet longer than a similar structure at Philadelphia, which for some little time held the distinction of being the longest span of its kind. The cost of the Spokane bridge will be about $550,000.

In connection with this it is to be noted that a span of 285 feet has been adopted to carry the New York Barge Canal over the gorge at Medina, N.Y., and the span of the proposed Hudson Memorial Bridge is to be 710 feet. With the exception of this bridge the largest single span yet proposed is one of 328 feet to be built over the Tiber, as described in the July issue of the Contract Record. A bridge under construction in New Zealand will have a 320 foot span.

Cement Production in Canada

The following table denotes the rapid advance in the Canadian manufacture of Portland cement, and the corresponding decline of natural rock cement. The figures are for the past ten years.

Year	Natural Rock Cement	Portland Cement
1901	133,328	317,066
1902	127,931	549,594
1903	92,252	627,741
1904	56,714	910,358
1905	14,184	1,346,548
1906	8,610	2,139,164
1907	5,775	2,436,093
1908	1,044	2,665,289
1909	......	4,010,180
*1910	......	4,753,975

*Subject to revision.

Chas. F. Stevens, Secretary, St. John Builders' Exchange.

The Cement Products Exhibition Company, 72 West Adams Street, Chicago, has assured the prospective exhibitors at the New York Cement Show that the sale of Madison Square Garden will not affect the holding of the New York exhibition in this building. While most of the reports which have been circulated during the last three years that Madison Square Garden was to be demolished, seem to be untrue, it is a fact that a New York syndicate has recently arranged to purchase the building with the intention of erecting a big office building in its place. The contract for the purchase of the property, however, will not become operative until about March 1, 1912, which is several weeks after the dates set for the New York exhibition.

The coming show will be the last time the cement gathering will be held in the celebrated old structure on Madison avenue and Twenty-seventh street.

The Investigation of Water Impurities

Water for Industrial Purposes and for Household Use—Examination is Necessary for Both—Example of Inferences Drawn

By L. K. Russell, B. S.[*]

That pure water is one of the factors making for good health, few deny; but in a strict sense the mention of pure water is speaking of something that rarely exists, for even the distilled water of our laboratories is not pure in the chemist's sense; that is, it does not consist entirely of the elements, hydrogen and oxygen, chemically combined. Water is so readily a solvent of all kinds of matter, gaseous as well as solid, that unless extreme caution is taken, it is never chemically pure. When so prepared, as it may be occasionally, for experimental purposes it is to the scientist worth any price.

But what we intend to say, and what we desire is not a pure water but a safe water,—one not likely to injure health. Such water we can find quite readily; and it is with this object in view, to prove the safety and guard against its pollution, that examination of water is made. The examination of water is made generally for two purposes: to determine its fitness as a potable water, i. e., for use for household or domestic needs; and its use for industrial purposes.

The Examination of Water

The examination of water for the first class is called the sanitary water analysis; and of the second class, industrial water analysis.

The examination of these two classes is not distinct. The sanitary analysis includes the total amount of mineral matter held in solution, and the amount of that matter which causes "hardness," i. e., the precipitation of soap preventing formation of lather. Industrial analysis includes this, but it determines also the particular substances which cause scale or corrosion.

The specific mineral contents are often determined in so called mineral waters, but rarely with the exception of "hardness," in sanitary analysis.

The sanitary analysis of water includes the physical, chemical, and microscopical analysis, and the bacteriological examination. The object, as stated before, is to find out the quality of the water. Is the water at present receiving pollution of any kind? To what extent? Has the water at any time somewhat remote received pollution; if so, what is the origin of this pollution, animal or vegetable? Is the water hard or soft? Are there any vegetable organisms which by growth and decay are likely to cause nuisances due to odors? All these questions and others, the chemist has to answer from his sanitary examination.

In our laboratory work we shall devote the time to physical and chemical examination, and shall only learn of the methods of the microscopic and bacteriological.

Sources of Water

The sources of our water are the dew, rain and snow which fall upon the earth's surface. The process by which this takes place is exactly similar to that of distillation and condensation, as conducted in the laboratory. The evaporation takes place from the ocean and larger lakes aided by the sun's rays and the winds. This moisture carried into the atmosphere remains until, by a change of temperature, condensation occurs and the moisture is precipitated, as rain or snow, depending upon the temperature. This precipitation is at first practically distilled water, but even in its passage through the atmosphere it absorbs gases, as carbon dioxide, ammonia, oxygen, and in the neighborhood of towns and cities sulphur dioxide, soot, and dust particles, both mineral and organic. It is quite high in ammonia.

Rain water is a "soft" water, and contains little mineral matter in solution; but when it reaches the earth it begins at once to dissolve the mineral salts, carbon dioxide, and "albuminoid" ammonia, of which latter we shall have much to say. The water thus enriched is capable of greater solvent action on rocks and soils. The water collects and may form rivulets and brooks, enlarging later into ponds and rivers, or it may sink deeper into the ground and then emerge as springs or become our wells. The rivers and ponds,—so-called surface waters, pass through the fields and forests where they take up considerable vegetable matter, such as leaves and peaty material. The color of the water is changed by this; and from the colorless water of the rain (that away from towns, at least) as viewed by looking through a considerable layer upon a white surface, as in Nessler tubes, it changes to a yellow or a brown color. This depends upon the amount dissolved, the color deepening with increasing amounts, similar to the steeping of tea. This vegetable coloring is organic matter. It is a highly complex molecule containing the elements carbon, nitrogen, oxygen, hydrogen, and is called by the name of "albuminoid ammonia." The estimation of the amount of albuminoid ammonia is important, but we must take into consideration its origin. If this be leaf or peaty matter, it is harmless, but if it be household and city wastes, which we may designate by the term sewage, it is objectionable and likely to be highly injurious. Our analysis of albuminoid ammonia does not point out its source.

The water which sinks into the earth will take up a larger amount of mineral matter, but there is much less organic matter, peat or leaves. This water should be practically colorless. In distinction from the water which flows over the surface of the earth, surface waters, we designate wells and springs, as ground waters.

Water Pollution

Up to the present we have assumed that the rain fall which we have followed in its collecting together, either as a surface or ground water, has not come in contact with the "wastes of human life." Such a condition could not long be maintained except in the virgin forests far away from habitation of man. Far up on the hillside it may be, a lonely farm house has diverted a little stream for drinking purposes. It flows through a sunken trough, where it may be dipped up both for family and barnyard use. A little way below this trough the flow from the kitchen sinks finds its way into the brook. This it may do by directly flowing along the surface or sinking into the ground, emerging again into the brook, with less turbidity and other changes not so apparent to the eye. Again, the family cesspool, the barnyard with its manure heap, and the fertilized fields all have drainage outlets into the brook. This process of adding to the brook the "wastes of civilization" is repeated over and over again as the brook, increasing in size to the river, continues on its way. What the changes are which take place under the circumsources described, we will relate further on, but what we must remember is that along with the "household wastes" there may be disease germs, or typhoid. Of course, there are chances of purification. Seeds of tiny plants sprout and grow in the water, feeding upon the products of organic decay which have entered the water.

---

[*] Professor of Chemistry, Clarkson Memorial School of Technology.

A part of the water sinks into the sand, and by this filtration becomes freed from suspended matter and disease germs. By running over rocks and minute waterfalls oxidation by the oxygen of the air takes place. Another purifying process is its storage by which suspended matter settles, and oxidation goes on.

Organic Matter in Water

We have named the elements of organic matter as carbon, hydrogen, oxygen, and nitrogen, the latter being the essential element of animal life, and by its quantitative estimation we may judge the pollution of the water. This may be present in at least four combinations, and our sanitary examination includes these four determinations, viz: albuminoid ammonia, free ammonia, nitrates and nitrites.

The term albuminoid ammonia, includes all the highly organized complex forms in which the nitrogen may exist as organic matter, and is the form in which the latter enters into the water. As previously explained, we cannot distinghish by this fact alone, the source of the nitrogenous matter, whether harmless vegetable matter, or the extremely harmful animal refuse. But once in the water, decomposition sets in, aided if not caused by the minute organisms, known as bacteria; and organized nitrogen passes from the form of albuminoid ammonia to free ammonia, remaining in this form in solution. In passing, we may remark that the animal refuse will more quickly pass through the change noted than vegetable matter. Nitrogen as free ammonia next passes by bacterial action to form of nitrites, and finally into form of nitrates. Our surface waters are high in albuminoid and free ammonia, and the ground waters in nitrates and nitrites, especially the former. In fact, the forms of free ammonia and nitrites are transition forms, while the nitrates are a permanent form, and are not decomposed by bacteria, but only by chlorophyll or greengrowing plants. We judge of the nearness or of the remoteness of the pollution by the form in which we find the nitrogen present. A water high in albuminoid with some free ammonia, and nitrites, but low in nitrates, has received pollution within a short time. If these are low and nitrates high, pollution took place at a period somewhat remote. If all are present, the water has received pollution not only at a remote stage but is also receiving it at present.

Chlorine in Water

Another accompaniment of animal refuse pollution is chlorine which enters the water as sodium chloride, or common salt. We must, however, take into consideration that all water has present in it some chlorides which it dissolves from the soil or which has blown into it from ocean fogs. So in our final decision of the quality of the water we must take into consideration its source and locality. Distance from the ocean, the existence of mountains between the water and the sea will regulate the amount of sodium chloride carried along by the winds and deposited in the surface waters. One very important point must be noticed in regard to chlorine, once in the water it remains as it enters. There are no such transformations as is the case with nitrogen compounds. For this reason and the fact that it is present in sewage it is looked upon as helpful determination especially in surface waters, where any considerable amount over the normal for the region lends one to view the water with suspicion.

The "total solid residue on evaporation," or as it is more often called "total solids" is determined. This gives a measure of the solid matter held either in suspension or solution; and when this residue is gently ignited, (heating the outside of the dish containing the residue with the flame of the Bunsen lamp) by which means the organic matter is charred and oxidized, and thus removed, we get a measure of the carbonaceous matter present; for a second weighing will detect this removal. This is reported as "loss on ignition," or volatile matter. The difference between the weight of total residue and loss on ignition is considered to be the mineral matter.

Another method which gives a measure of the carbonaceous matter present is that of "oxygen consumed." The water is heated with a known amount of oxidizing agent, as potassium permanganate, this giving up its oxygen in proportion to the amount of carbonaceous or easily oxidizable matter present. By analytical methods we can determine the amount of our reagent so decomposed.

WATER FROM POTSDAM WELLS

In Parts Per Million

Total Hardness	I	249.0	II	533.8
Oxygen Consumed	I	0.0	II	33.17
Chlorine	I	7.0	II	24.12
Nitrates	I	1.5	II	36.0
Nitrites	I	0.0	II	.002
Free Ammonia	I	.008	II	.076
Albuminoid Ammonia..	I	.012	II	.16
Total Solids	I	370.0	II	900.0

I—Does not indicate pollution. II—Indicates pollution.

Summary of Results To Be Obtained by Analyses

The "hardness" of water determines its fitness for domestic purposes, especially for washing, as very hard water increases soap bills and is rough on hands and clothes.

In addition to the chemical tests given, a physical examination is made to note odor, hot and cold, turbidity, sediment, and color.

Under the microscope an examination is made to detect such micro-organisms as would by their growth and decay cause unpleasantness to sight, smell or taste. In some cases special samples are taken to find out the number of bacteria per cubic centimeter.

In the ways mentioned by chemical, physical, microscopical, and bacteriological tests an accumulation of evidence is obtained, from which the water analyst passes judgment upon the desirability and safety of the water for potable purposes. This is not a simple task, as there is no hard and fast line up to which the amount of a substance may go and be safe, and above which the water is to be condemned.

The task before the water analyst is not like that of the assayer who reports definitely that the ore submitted to him contains a certain number of ounces of gold per ton, but rather it is that of the physician making his diagnosis from observed symptoms. The data we have collected tells us the past and present history of the water, and with a knowledge, if possible, of its surroundings we must advise whether or not it is best to use it.

According to reports from Edmonton the shortage of cement is still very grave. The Edmonton Builders Exchange appointed a committee to investigate the deficiency and ascertain what steps should be taken to relieve the highly unsatisfactory situation. The committee, however, have decided that they can do nothing, and the Board of Trade will be asked to make an investigation. At present the price of cement in Edmonton is $3.25 to $3.50 barrel.

General Notes on Placing Reinforcement

Pointers Relative to Cleanliness of Steel—Assembling, Centering, Spacing and Binding are Among the Many Points of Importance

By Jerome Cochran, C.E.

As soon as the steel reinforcement is delivered at the site it should be carefully checked, assorted and stored in such a manner that it can be readily inspected. The steel should not be permitted to lie on the ground, but be blocked up several inches. It should always be protected from rust, dirt, oil, paint, etc., and so stored that those portions needed first may be reached without disturbing the remainder.

Handling Reinforcement

All metal which has been bent or otherwise injured in handling or in transit should be carefully repaired before being used, it being insisted upon that all bars shall be straight and free from flaws in any degree calculated to impair their strength. Should any bar be broken it should be laid aside and another bar of the same length and cross-section procured without delay.

Cleanliness of Steel

The steel reinforcement, before being placed in forms, should be thoroughly cleaned from loose, scaly rust, dirt, oil, paint, or any coating that may be detrimental to the positive adhesion of the concrete to the steel. A slight film of red rust, which facilitates the forming of a hard film or coat of ferro-calcite and increases the adhesion of the concrete, should not be considered objectionable, but any bar on which rust scales have begun to form or have already formed, should be unconditionally rejected, unless such scales are thoroughly removed with wire brushes or by other means. Concrete which has lodged on the steel and hardened during previous work should be entirely removed before the reinforcement is finally concreted in, so as to insure a better adhesion of the fresh concrete to the steel.

No steel reinforcement should be painted or oiled, although some engineers have specified that the steel shall receive one coat of pure linseed oil before leaving the factory.

Methods of Cleaning Reinforcement

All heavy rust and mill scale should be removed from the reinforcing metal by hammering, steel scrapers or brushes, pickling in a weak solution of hydrochloric acid, or by some other equally efficient means of cleaning the metal, before being covered by the concrete.

Steel bars may be cleaned by pickling in a bath consisting of one part commercial sulphuric acid to six parts water, or other proportions depending upon the amount of rust on the bars. Bars must be washed thoroughly in clean water after the bath and before placing in the concrete.

Cleaning Forms

No steel should be permitted to be placed until the forms have been thoroughly cleaned and inspected. Forms must be cleaned of all dirt and shavings and care must be taken to prevent new dirt and shavings from coming into the forms. Provisions should be made in the bottom of all column forms for cleaning them out. It is also customary to require that the same provision be made in beam and girder forms. The failure of several buildings has been attributed partly to the fact that shavings had collected at the junction of beam and column forms.

Marking Centering

When the forms are ready for the steel the contractor should be required to go over the floors with the blue prints and a piece of crayon or keel and letter the beams and girders to correspond with the plans, in large figures on the decking beside the beams, and should specify the bars required, thus:

Beam B1: Two 1-in. Rounds, Bent.
Two 1¼-in. Rounds, Straight.

Assembling of Reinforcement

The steel reinforcement should be so assembled that the exact number, size, form, spacing and location of bars, stirrups, ties, spacers, etc., called for by the engineer's plans, is adhered to in every member. Should any discrepancy be noted in regard to the reinforcement of similar members, or any reinforcement omitted, it should at once be brought to the attention of the engineer in charge of the work or other proper authority, and not allowed to pass unobserved, as is quite often the case.

Inspection of Reinforcement

All steel reinforcement should invariably conform to plans and details, and should be placed and inspected by the engineer in charge before any concrete is put in place, and to admit of this inspection steel for a day's work should be placed in advance of the concrete.

The engineer should insist upon the reinforcement being accurately placed, and any carelessness on the part of the contractor in this should be sufficient grounds for the engineer to require the removal of the work and the replacing of it correctly. There is a great temptation on the part of many contractors to neglect this work, trusting that everything will come out right, regardless of how the reinforcement is placed. The writer has heard of a case where the reinforcement for footings was placed directly on the ground.

Thickness of Concrete Covering

The minimum exposed concrete covering of all faces for steel reinforcement should be as folloms: ¾ in. for slabs, 1¼ in. for beams and girders, 1½ in. for columns and walls, and 2 in. for foundations.

However, in case of direct permanent exposure to the elements, this minimum covering should be uniformly 2 in. Some engineers allow ½ in. for slabs, while some have required 1 inch.

Distance Between Reinforcing Bars

The clear spacing between parallel reinforcement in beams and girders should not be less than 1¼ in. No reinforcing bars to be closer together than 2¾ diameters, centre to centre.

Placing Reinforcement in Proper Position

Reinforcement should under all circumstances be placed under the direction of the engineer or inspector in charge, and all such erection and placing should be in charge of competent foremen who shall be familiar with the drawings and preferably with at least two years' experience in reinforced concrete construction.

Before placing concrete, the steel reinforcement must be placed the proper distance from the bottom and sides of forms and in the position required in the finished structure, and each piece or member so firmly fixed as to p tively prevent any subsequent displacement. Especial care should be taken in placing steel in its proper position, and it should be the duty of the inspector to insist that it be so fixed and held in place in the forms that it will not be displaced from its proper position and spacing during the placing and compacting of the concrete. Too much stress cannot be placed upon this important requirement, for the failure of many structures may be attributed to this fact.

Loose-Bar Method

Particular attention should be given to loose-bar reinforcement that it is accurately and properly supported in position, so that all parts shall remain in true relation and alignment until locked in the setting concrete. Such device or devices should be used as will absolutely prevent the bars from approaching the forms beyond the limits specified for protection, and at the same time maintaining a uniform and accurate spacing of the bars throughout the length of the members.

Assembled-Unit System

Care should be taken in handling unit systems that the lower units are not bent out of shape by the weight of those above.

Spacing Chairs

Spacing chairs and clips for separate bar reinforcement should be made of heavy weight and good quality of sheet-steel. They should have ample strength against crushing under such loads as are likely to come on the reinforcement. The bottom edges of the chair should be bent to form flat feet and prevent cutting into the form boards when used to support floor reinforcement. For wall and column reinforcement, the bending of the bottom edge of the chair to form feet may be omitted, and for spiral hooping the slots for the spiral rods must be cut to pitch so that the chairs be straight with the vertical bars.

All metal separators used to keep the reinforcement at the right distance from the forms should rest on a piece of galvanized iron, or else a rust spot will show on the under surface.

Notched concrete spacing blocks composed of the best concrete may be substituted for the metal spacers when used for the floors system. The notches should be properly spaced so as to separate the bars from each other and from the sides of the forms, and the blocks should be of the proper thickness to hold the bars at the required height above the bottoms of the beams, girders and slabs.

Ample supports should be furnished so as to prevent sagging of the reinforcement.

Wooden blocks should not be used unless absolutely unavoidable, for the reason that remaining in the concrete, as they are liable to do, a weak spot will be developed.

Bending of Bars

All reinforcing bars should be bent before they are placed in position and the bending done in such a manner that they will not break or crack at the bend, the bending force being applied gradually and not with a jerk. Bending should be done with absolute accuracy in accordance with the detail drawings for the various portions of the structure. The inspector should insist upon the bends being accurate in line and plane.

All ordinary bending should be done cold. It is very important, especially in bending large bars, that the force be applied gradually and evenly, and not with a jerk, as is customary with some contractors.

If the bars are heated and blacksmith work is done, care should be exercised that the steel is not burned in the operation, otherwise the engineer in charge is justified in condemning it. Warming up to a low cherry red should under all circumstances be the highest heat permitted.

Bar Benders

All reinforcing bars for an entire job should be bent in a bending machine in accordance with the dimensions and forms shown on the drawings. Bending machines should be required to bend any kind of a steel bar up to 1¼ inches in diameter to any angle required.

Splicing of Bars

The splicing of bars should be done exactly according to the engineer's plans, no splices being permitted except at points shown on plans. Various forms of splices are in use, and if not definitely instructed by the plans and specifications the contractor should learn from the engineer just what sort of form or forms will be acceptable.

The length of lap required for splicing of reinforcing bars in tension should be determined on the basis of the safe bond stress and the stress in the bar at the point of splice; or a connection should be made between the bars of sufficient strength to carry the stress. Splices at points of maximum stress should be avoided. Joints in bar work should be lapped at least 18 inches.

No welding of reinforcement except in column hoops should be permitted without special permission from the engineer.

Protruding Ends of Bars

The bends of bars which are left protruding for splicing should be, if they are likely not to be connected up for some little time, painted with cement paint to diminish rusting, and guarded against being bent or loosened. Throughout the work care must be exercised to prevent disturbing bars, portions of which are embedded in fresh concrete.

Fastening Reinforcement

All reinforcement should be securely fastened to preserve spacing, location, alignment, etc. Braces, blocks, suspenders, spacers, ties, etc., should be used in ample number to make certain of this feature. All temporary fastenings should be removed when the concreting reaches them.

Whenever practicable, all reinforcing metal should be put in place in the form and securely fastened in correct positions by wiring or otherwise before the placing of the concrete is begun. The wiring of reinforcement at intersections should be done carefully and strongly, using No. 16 or No. 18 B. & S. gauge soft black wire.

All wiring, straps, braces and templates required for the proper holding of the reinforcement in place must be furnished by the contractor in a manner entirely satisfactory to the engineer.

Tagging Reinforcing Bars

When the bars are cut and bent to proper shape, each individual bar in every beam and girder, or group of bars in columns, slabs, walls, footings, etc., should be tagged with a cloth tag wired securely to the bars (for beams and girders), or each bundle of bars, and marked with the proper number of the structural member, and the tags should be left on after the bars are placed in proper position in the forms. The engineer or inspector should examine the bars after they have been placed, personally remove the tags, after which the concrete may be placed.

Placing Concrete

Concrete should not be deposited in any position of the work until all the reinforcement for that section of work is in position and has been checked over to see that it agrees with the drawings. The steel work must be kept sufficiently ahead of the concrete work to give ample time for inspection.

Protection of Reinforcement

After placing steel reinforcement in position, if concreting be interrupted for any considerable number of days, the steel should be protected with canvas or tarred paper or other satisfactory covering.

Additional Reinforcement

Should the contractor deem it necessary to increase the reinforcement over and above that called for on the schedules, in order to take the responsibility for the work, he should be required to increase the same without cost to the owner.—Engineering Record.

Canadian Consulting Engineers

L. B. Merriam, C. E.

Mr. Merriam is a native of Illinois, and graduated from the State University in 1879 at the early age of 19 years. The following sixteen years were those of experience in all branches of railway location and construction work for the Chicago, Milwaukee and St. Paul; Chicago and Northwestern; Chicago, Burlington and Northern; Mexican Central, and other lines, approximately half of this time being spent in the employ of the C. & N. W. Railway, in charge of Construction and Maintenance of Way on the main line west of Chicago.

L. B. Merriam, C. E.

As consulting engineer with offices at Dekalb, Ill., Mr. Merriam designed and built waterworks, brick pavements, sewers and bridges until the fall of 1898, when he organized and directed considerable revision work on the Union Pacific Railway. In 1901 he engaged as engineer with the Colorado Fuel & Iron Company, and the Colorado & Wyoming Railway on mine development, town layout and construction, coke and washery plant, etc., and also as superintendent of construction for Reservoir No. 2 at Pueblo, Colo. In 1904 he undertook and successfully accomplished the construction of fifty miles of Union Pacific Railway line on the Topeka & Northwestern branch.

In November, 1906, Mr. Merriam engaged on the Grand Trunk Pacific Railway, being given charge of construction work from Winnipeg to Saskatoon and thence to Battle River bridge. Since then he has carried on a general engineering and contracting practice, with headquarters at Winnipeg.

Mr. Merriam has always been an advocate of day labor, and in his many successful enterprises in former railway work contract labor for grading was his only deviation from the rule.

He is a member of the Canadian Society of Civil Engineers, Western Society of Civil Engineers, and of the American Railway Engineering and Maintenance of Way Association, as well as being a member of the Winnipeg Builders' Exchange.

Sewage Disposal Works

The City Engineer of Calgary has recommended that the services of T. Aird Murray, consulting sanitary engineer of Toronto, be engaged to advise the city about the establishment of a sewage disposal plant. Up to the present the city has been running its sewerage into the rivers, but last year the provincial health department warned all municipalities in the province that this practice must be stopped. Calgary accordingly made preparation for the construction of a large trunk sewer and bought a site for a sewage disposal system in Bonnybrook, east of the city. The contract for the trunk sewer, which is to cost close upon $200,000, has been awarded, and the engineer's department is now turning its attention to the question of the sewage disposal works.

Market for Portland Cement

There appears to be a large and increasing demand for cement in New Zealand. Extensive improvements are being carried on by the Harbor Boards. In Auckland, the works now being conducted consumes 6,000 tons of cement a year. The chairman of the Auckland Harbor Board has signified his willingness to entertain proposals from Canada for supplying 6,000 tons a year for three years, delivered the first year at the rate of 500 tons per month. The price quoted must be by the ton of 2,240 lbs., c.i.f., on the works at Auckland. The cartage from the oversea vessel to the works would be 2s. 6d. a ton.

Any offer to fill this contract should be accompanied by satisfactory evidence of ability to do so. The duty on cement is 2s. a barrel, the barrel to be taken at 380 lbs. weight; upon the foreign article there is an additional duty of 2s. a barrel, so that Canada enters the field (as against foreign competition) 2s. a barrel to the good. The market now extends to 100,000 tons a year, and is rapidly expanding.

Peril in Leaky Reservoir

One of the city's large reservoirs in Highland Park, having a capacity of 120,000,000 gallons a day, has been condemned following an inspection by the members of Pittsburg's new council, Mayor William A. Magee and Joseph T. Armstrong, director of public works. Each of the officials expressed surprise that a bad accident had not occurred, and Director Armstrong said: "Acceptance of such a piece of work by the city, to be paid for out of tax money to the people, was a crime." The reservoir was completed a number of years ago at a cost of $500,000. Great holes and cracks line the entire basin, and close to $200,000 will be necessary, experts say, to repair and make it safe. Meanwhile, the reservoir will be abandoned.

Trade Notes and Items of Interest

The Otis-Fensom Elevator Company, of Toronto, are contemplating an addition to their plant in Hamilton.

Tenders are called for the earth work, concreting, and appurtances in connection with the proposed filtration plant for the city of Montreal. The date for completion has been set as Sept. 1, 1913.

Tenders have been called at the City of St. Thomas, for the supply and installation of a 6,000,000 gallon centrifugal pump, and steam engine.

There is a movement on foot in Hamilton to organize the cement workers of the city with the probability of affiliating with the Trades and Labor Council.

The Berlin Water Commission propose drilling a 10-inch well 300 feet deep in an effort to provide an additional supply for the citizens. The cost is expected to be about $2,500.

The Department of Railways and Canals, Ottawa, have called for tenders for the removal of unused material intended for use in connection with the construction of the old Quebec bridge.

The Littlefield-Clark Company, of Buffalo, have a pamphlet descriptive of their Efficiency Woodworker, a portable combination machine of especial interest to contractors, builders and lumbermen.

An ordinance was recently passed by the city council of Seattle abolishing the fees for building permits and it is expected that plumbing, electrical and other inspection fees will also be abolished.

Operations are being started on the new plant for the Diamond Flint Glass Company at Hamilton. The new building will cover a ground space of 300 by 150 feet and will cost approximately $50,000. Excavation work has begun and it is hoped the building will be finished before fall.

The York County Highway Commission are experiencing no slight difficulty in securing sufficient materials. Owing to a scarcity of granite only one outfit is at present in operation. The Good Roads Commission are carrying on operations themselves owing to the excessive figures submitted by contractors for the construction.

The Rhodes-Curry Company, of Amherst, N. S., have commenced operations on the new general office building for the International Railway at Moncton. The proposed addition, which will cost about $100,000, is being erected at the western end of the present building. The dimensions of the new wing are 139 feet by 57 feet.

Municipal Ownership of Street Railways is to be put in force at Winnipeg, Man. Press dispatches state that Mayor Evans of Winnipeg announced on July 20 that the city authorities have decided to purchase the entire plant of the Winnipeg Electric Railway Company, including its hydraulic power plant and the gas and electric light plant which it owns.

A difficulty recently experienced by the Grand Trunk Pacific in attempting to cross the irrigation lands of the Canadian Pacific Railway near Calgary, Alta., has resulted in a dissolution of the impending injunction, and, after considerable delay, construction of the Calgary branch may again be resumed, according to the report of the attorneys of the road.

Messrs. G. Amyot & Co., of Quebec, who recently bought several acres of land, at Maisonneuve for the purpose of erecting a big corset factory, have been offered freedom from taxation for ten years if they will rebuild and remain in the Ancient Capitol. This they have decided to do. They have over $100,000 worth of property in Montreal at present.

South Vancouver contains 70 miles of wooden mains with some 136 fire hydrants, and according to the engineer's report there is no indication of a leak throughout the entire system. The report speaks well for this type of water main and should tend to eliminate the undue amount of prejudice that prevails among those who have not studied the efficiency of wooden pipe for water mains.

The Montreal Harbor Commissioners are making extensive additions to their storage elevators, and one with a capacity of nearly 2,000,000 bushels is now in process of construction. It is interesting to note that, when complete this elevator will be capable of handling 40,000 bushels inward per hour, and at the same time 60,000 bushels outward. With this addition the capacity of the port will be over 5,000,000 bushels.

As a result of the recent fire in which a large portion of the Hamilton asylum for the insane was destroyed and a number of lives lost, the fire authorities began an investigation of the various other charitable institutions in the city, and discovered a number of them to be quite unsafe for the purposes for which they are used. General orders have been sent out necessitating that all buildings be properly equipped at once with suitable fire escapes and other protection devices.

The Lock Joint Pipe Company has completed its contract for the manufacturing of the pipe required for the trunk sewer work of the City of Regina. 1½ miles of trunk sewer has been completed which is one-half of the work called for by the present plan. The engineers in charge of the work expect the whole work to be completed by the 1st of December. Excavation at some points on the line attains a depth of 30 feet, and it is expected that this will be necessarily exceeded to maintain proper grade.

The great amount of street paving now under contract in the city of Quebec, and the provincial government movement for the improvement and macadamizing of country roads has given an enormous impetus to the quarrying of stone in the district and to the trade in broken stone. A company has been formed with a capital of $60,000, under the title of the Quebec Brick Company, which is operating quarries along the line of the Ste. Anne Railway, and delivering immense quantities of broken stone for concrete work to the contractors for the city street paving.

Plans are being prepared by a Vancouver firm of engineers for a new water power plant for Kamloops. The city is preparing to expend $200,000 in developing 5,000 horse power on the Barrier River, a tributary of the North Thompson River. The power will be conveyed forty miles to the city, where it will be utilized in pumping water for the reservoir and waterworks systems, as well as for industrial purposes. It is also proposed to extend the waterworks system by building many additional miles of mains and sewers, owing to the rapid growth of the population. The surplus power not required by the city will be sold to private parties.

The Penobscot Chemical Fibre Company, Great Works, Maine, recently secured control of power rights on the Penobscot at Orono, just below their works, and the concrete dam for this development which will be ultimately about 65,000 h.p., has been designed by Hardy S. Ferguson, consulting engineer, 200 Fifth Avenue, New York. This year the company is building the abutment and a 100-ft. length of the dam. On June 1st the Aberthaw Construction Company started the construction of the eight new concrete flumes at the main works of this company, which were also designed by Hardy S. Ferguson, of New York. At the present time there are four flumes in operation and the eight new ones will furnish electric power for bleaching purposes.

Personals

Mr. Jas. Greer, a well known contractor of Edmonton, died on July 30th.

A party of American engineers recently inspected the plans and construction of Toronto's system of sewage disposal with a view to obtaining information for the new system that is being planned for the city of Rochester.

Mr. Fred Henning, chief engineer of the Island pumping station, Toronto, who perfected a device for the proper chlorinating of the water supply, which was described in the July 12 issue of the Contract Record, is to be rewarded for his ingenious invention by the city council.

Mr. S. B. Clement, Assoc. M. Can. Soc. C. E., Chief Engineer of the Temiskaming & Northern Ontario Railway, has been given jurisdiction over engineering, maintenance of way and motive power departments, succeeding to a part of the duties previously performed by the Superintendent, Mr. J. H. Black, who has resigned to accept a position with the Northern Ontario Light & Power Company.

Building Activities

Building continues fairly active in Ottawa and the month of July shows a great increase in the number of dwelling houses being erected.

The building industry in Saskatoon was recently temporarily handicapped on account of water and is also being held back in a number of instances owing to the scarcity of gravel.

The Dominion Sugar Company, of Wallaceburg, Ont., are having plans prepared for a new factory to cost some $700,000, to be erected in Chatham. It is expected that the foundation will be put in this fall.

Plans have been accepted by the city of Windsor calling for 640 feet of 60-inch steel water pipe in the bed of the Detroit River with a cement well 46 ft. x 18 ft. x 20 ft. 9 in. at the shore. The intake will cost $30,000.

The Board of Control has asked the Montreal City Council to approve of the appropriation of funds for preliminary work in connection with the plans for underground conduits in the city for the preparation of which a commission was recently appointed.

For the seven months ending July 31st the amount of building in Kingston was $172,604, according to a report issued by City Engineer Craig, as against $135,960 during the same period of 1910. It is estimated that the total number of permits in 1911 will be in the neighborhood of $300,000.

Building Inspector Rodgers of Winnipeg states that the 1910 record of Winnipeg will be largely exceeded this year. The amount of building for July, 1911, was $2,787,100, which was two and a half times the amount issued for the corresponding period of the record year. The total value of building permits issued this year in Winnipeg amounts to $11,368,650.

A reinforced concrete ice house was recently erected in Philadelphia, with sheet cork as the insulation throughout, instead of wood and mill shavings, and the like, which have generally been used. The insulation of the ceiling consists of 3-in. cork boards, attached with cement to the under side of a reinforced concrete slab. The walls are insulated with two layers of 2-in. cork boards, with all joints broken, and the floor with two layers, laid in hot asphalt on a concrete base. The finish on the sheet cork, and walls, and ceiling is Portland cement; for the floor finish a concrete and cement mixture is laid directly on the cork.

The contract for the construction of the first section of the Hudsons Bay Railway from Le Pas to Thicket Portage, a distance of 185 miles, was awarded on August 10th to J. D. McArthur, whose tender amounted to a little less than $3,000,000, and was well within the estimate of probable cost based upon the Government's survey. Mr. McArthur is prepared to start active construction work at once, and considerable progress will be made this fall. He has practically completed his contract for the section "F" of the National Transcontinental from Superior Junction to Winnipeg, and has his equipment and men all ready to undertake the new contract. The balance of the road will be placed under contract next year.

Publications

The second edition of Reginald Pelham Bolton's "Building for Profit" is announced by the De Vinne Press, 395 Lafayette Street, New York. Its author has had unusual experience in the designing, construction, operation and ownership of metropolitan buildings, during a period of fifteen years, and he is widely regarded as one of the leading authorities in his line. He makes the bold tssertion that any unsuccessful building can be made a money-maker by applying certain principles to its management. "Violate these principles," says Mr. Bolton, "and you incur a loss; observe them, and your building is an assured success. Test your real estate investments by these principles, and you can determine in advance if they will pay you dividends."

One of the most valuable publications of the year is the volume just issued on "Lands, Fisheries, Game and Minerals," by the Dominion Commission of Conservation. The book, representing as it does a great deal of exacting research work, makes available to the average man a mass of instructive and entertaining information otherwise unobtainable by him. As a reference work for the journalist, the student of public questions and the well-informed man on the street, it will be found of no small value. It is a large volume of some 525 pages, substantially bound in cloth and fully illustrated throughout with maps, diagrams and two-color engravings. The volume is perhaps the most thorough and complete record of investigation and research that has ever been issued by any government in Canada.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope, and stating number of enquiry.

734. **Mosaic, &c.**—A London company manufacturing mosaic and various kinds of tiles for building, as well as [illegible] and paving purposes, would like to get into touch with Canadian firms handling such materials.

736. **Cement.**—Cuban firm inquires for cement.

738. **Roofing paper.**—Cuban firm inquires for roofing paper.

740. **Pipes (clay and cast iron).**—Havana firm can place large orders for clay and cast iron pipe.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is nvited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Aylmer, Ont.

Tenders called for pavement. Owner, Town of Aylmer; T. Clerk, D. C. Davis. Town engineer, F. Wooster. 2,400 sq. yds. Bermuda road asphalt or vitrified brick pavement—tenders to include grading drains, gutters, etc. Specifications at office of clerk. Work to be commenced at once. Tenders received until 6 p.m., August 20th, by town clerk.

Calgary, Alta.

A by-law will be submitted on August 17 to raise $26,500 for sidewalks and another to raise $12,000 for bridge purposes.

Contemplated sewage disposal plant. Owner, City of Calgary, W. D. Spence. City engineer, J. T. Child. Engineer recommends that T. Aird, Murray Lumsden Building, Toronto, be engaged as consulting engineer in regard to sewage plant for which a site has been bought in Bonnybrook, east of city.

Schedule of extensions to waterworks. Owner, City of Calgary; city clerk, W. D. Spence; city engineer, J. T. Child. City Commissioner Graves recommends water main extension of about 27 miles; 3 miles of main to be built from the reservoir to Manchester, then to Park Hill, etc. Estimates will be prepared for presentation to council with street railway items.

Chapleau, Ont.

The municipality expects to construct considerable cement sidewalks in 1912. Apply T. J. Godfrey, Township Clerk, Chapleau, Ont.

Gravenhurst, Ont.

Tenders to be called for cement walks, $3,000. Town clerk, W. H. Cross. By-laws carried to raise $3,000 by debentures for constructing cement walks carried on the 4th inst. Council anxious to have work completed this fall. Tenders will be called for at once.

Tenders to be called for waterworks, $7,000. Town clerk, W. H. Cross. By-law carried to raise $7,000 to extend waterworks system and erect a water tower. Council anxious to have work completed this fall. Tenders will be called at once.

London, Ont.

An asphalt pavement on King street, from Adelaide to Exhibition grounds, was recommended by city council to board of works.

Little Current, Ont.

By-laws carried for cement sidewalks, etc. Owner, Town of Little Current. Clerk, D. McGilvery. By-law carried on August 7th authorizing borrowing of $5,000 for cement side walks and grading. It is expected that work will commence as soon as finances are arranged.

Milton, Ont.

Tenders called for iron pipe. Owner, Town of Milton. Chairman Board of Works, H. A. Dietrich. 16,310 ft. 5 in. standard wrought iron pipe. Delivery f.o.b. Milton, by Sept. 1st, 1911. Tenders close on the 10th.

Montreal, Que.

Tenders called for cement sidewalks, Notre Dame street. Owner, Board of Commissioners; secretary, L. N. Senecal. Construction of cement sidewalks. Specifications at City Surveyor's office. Tenders received by Board of Commissioners until noon, August 18th.

Tenders called for filtration plant. Owner, Board of Commissioners. Secy., L. N. Senecal, City Hall. Engineer, Hering & Fuller, 170 Broadway, New (1) Profilters and appurtenances, filtered water reservoir, sub-structures of gate houses ,conduits and connections with the existing aqueduct and suction well, pipe lines, etc., complete as shown and specified. (2) Additional earthwork. (3) Additional concrete. Plans, etc., at office of chief engineer, Public Works, Montreal, and in office of Hering & Fuller. Date for completion, Sept. 1st, 1913. Tenders received by Board of Commissioners until October 3rd.

Oakville, Ont.

By-law carried for sewers. Owner, Corporation of Oakville. Clerk, Chas. A. Bradbury. The by-law to construct sewers carried. Tenders will probably be called—Supplementary report later.

Point Grey, B. C.

Tenders called for steel pipe. (Dist. lots 540 and 139). Sec.-treas., H. Floyd. Engineer, Cleveland & Cameron, Winch Building, Vancouver. Excavation and refilling of trenches laying and jointing about 4½ miles of steel pipe. Specifications may be seen at office of engineers. Deposit of $10 required. Tenders received until Aug. 14th.

Saskatoon, Sask.

Tenders called for storm sewers and paving. Owner, City of Saskatoon. City engineer, George T. Clark. No. 97—all labor necessary for laying pipes and furnishing certain materials according to the following quantities. Vitrified tile pipe 1080 lin. ft. 15 in.; 2150 lin. ft. 12 in.; 1760 lin. ft. 10 in.; 6840 lin. ft. 8 in.; 2865 lin. ft. 8 in.; (catch basin branches) and 2205 lin. feet 42 inch, reinforced concrete pipe. Number 98—Furnishing 2205 lineal feet reinforced concrete sewer pipe and 6 reinforced concrete manholes 42 in. in diameter. No. 99—Furnishing 40 monhole frames and covers and 92 catch basin gullies. No. 100—Laying approximately 21,600 sq. yds. of pavement, and grading incident thereto. Plans, etc., at office of city engineer. Tenders received by City Commissioners until noon August 18th.

Thorold, Ont.

Tenders called for turning basin, $30,000. Owner, Department of Railways and Canals, Ottawa. Secretary, L. K. Jones. Plans, etc., at office of chief engineer of the Dept. of Railways and Canals, Ottawa, and at the office of the superintending engineer St. Catharines, Ont. Accepted cheque $1,500 to accompany each tender. Tenders received until 16 o'clock, August 21st.

Woodstock, Ont.

Tenders called for waterworks. Owner, City of Woodstock. City Clerk, John Morrison. City engineer, F. J. Ure. Construction of concrete settling tank, preparation of two additional filter beds. Plans, etc. at office of city clerk and engineer. Tenders received by city clerk until Aug. 19th.

Winnipeg, Man.

Tenders called for sewer pipe and specials. Owner, City of Winnipeg. Secy. Board of Control, M. Peterson, City Hall. City engineer, H. N. Ruttan, 223 James street, Winnipeg. Specifications with city engineer. Tenders received by Chairman of Board of Control until 11 a.m. Aug. 10th.

Tenders called for water pipe. Owner, City of Winnipeg; secretary board of control, M. Peterson. Supply of quantity of cast iron water pipe. Specifications obtained at office of City Engineers, 223 James avenue. Tenders received by chairman board of control until September 5th.

Windsor, Ont.

Tenders called for outlet for sewer, Parent avenue. Owner, City of Windsor; city clerk, S. Lusteed; city engineer, M. E. Brian. Supply of labor, tools and machinery for constructing a concrete outlet for sewer under Grand Trunk Railway tracks. Plans at office of above and at office of Canadian Engineer, Toronto. Certified cheque for five per cent. to accompany each tender. Tenders received by city clerk until 4 o'clock, August 22nd.

CONTRACTS AWARDED

Burnabay, B. C.

Waterworks, $160,000. (Edmonds). Owner, Corporation of Burnaby. City Clerk, W. Griffiths. Contractors, Evans, Coleman & Evans, Vancouver. Lap-welded steel pipes, $154,379. Delivery to be completed by January, 1912. Pipes to be supplied by Stewart & Lloyd, England; valves, Robertson, Godson Co., Ltd., 572 Beatty street, Vancouver, $2423; delivery of 3, 4, 6, 8, and 10-in. pipes by Sept. 4th and balance by October 24th. Special castings, Evans, Coleman & Evans.

North Bay, Ont.

Waterworks extension. Engineer in charge, J. H. Shaw, North Bay. Successful contractors for supply of materials: cast iron pipe, 2,550 ft. 10-in., 27,745 ft. 6-in., 11,004 in., Canada Foundry Co., Toronto; wood pipe, 15,500 feet 14-in., Pacific Coast Wood Pipe Co., 1551 Granville street, Vancouver; hydrants, valves, etc., 32 hydrants, 11 14-in. gate valves and valve boxes, 5 10-in. gate valves and boxes, 40 6-in. gate valves and boxes, 3 4-in. gate valves and boxes, Kerr Engine Co., Limited, North Bay.

New Westminster, B. C.

Sewers. Owner, City Council. Engineer, J. W. B. Blackman, C. E., New Westminster. Contractor, Sinclair Construction Co., Vancouver, $79,379. Others tendered—Romano & Pinto, Vancouver, $125,136; Lee & Blake, Vancouver, $100,372; Kibler & Roseleaf Eburne, $68,970; Kennedy, Vancouver, $84,800; Power Construction Co., New Westminster, $94,495; Municipal Construction Co., Vancouver, $143,712. Contract signed July 31st.

Ottawa, Ont.

The contract for the supply of new spur gear to replace the auxiliary at pump house was awarded to the Victoria Foundry Co., Ottawa, $375; other tenders were T. G. Brigham, $1,120; T. Lanson and Sons, $479; W. Hamilton & Sons, $497.

Contracts were awarded as follows: For pavements on Pretoria street, Union Asphalt Company, $8,346; other tenderers, Barber Asphalt Company, $9,720; Ottawa Construction Company, $8,960. Church street, Ottawa Construction Company, $4,560; other tenderers, Union Asphalt Company, $5,570; Barber Asphalt Company, $5,900.

Railroads, Bridges and Wharves

Berlin, Ont.

Tenders called for bridge. (Albert street). Owner, Town of Berlin, A. H. Millar, Town clerk. Chairman, Board of Works, H. A. Dietrich. Town Engineer, H. Johnston. Construction of reinforced concrete bridge. Plans, etc., at office of town engineer. Tenders received by town clerk until 6 p.m. Aug. 17th

Broadview, Sask.

Tenders called for depot. Owner, Canadian Pacific Railway. Brick and stone. Plans, etc., with divisional engineer, Brandon. Tenders closed August 16th.

Calgary, Alta.

Dominion charter granted for railway. (to Carbon, 60 miles distant). Charter granted to Alberta Electric Railway and Alberta Land & Traction Co. Line to Carbon to be built first; afterwards to Banff, Lethbridge, brooke Medicine Hat, etc. Electricity tne not motive power at first. Oil engines of a type similar to those in use in automobiles will be used, also auto trucks to bring farm produce to railway.

By-law to be submitted for purchase of bridge. (over Bow River). City Clerk, W. D. Spence. City Engineer, J. T. Child. By-law for $12,000 for purchase of Centre street bridge from private company.

Recommendations for track laying, etc. Owner, City of Calgary. Street Railway Superintendent, Mr. McCauley. Supt. recommends double tracking at an estimated cost of $142,140; also that 18 new cars be ordered at once.

Tenders called for addition to station. Owner, Canadian Pacific Railway, Montreal, Que.; assistant chief engineer, J. G. Sullivan, Winnipeg. Erection of west wing and addition to present east wing of station. Plans at office of engineer. of station. Plans, etc., at office of engineer, Winnipeg, and division engineer's office, Calgary. Tenders received at above offices until 5 p.m., August 18.

Guelph, Ont.

Extension of time for bridge. (over River Speed, Neeve street). Owner, City of Guelph. T. J. Moore, clerk. Acting City Engineer, L. Malcolm. Construction of concrete arch bridge and viaduct over C. P. R. Approximate amount of concrete, 572 cu. yds. Plans, etc., at office of City Engineer or Contract Record, 220 King street West, Toronto. Tenders received until August 16th by T. J. Moore, City Clerk.

Montreal, Que.

The contract with the Canadian Vicker Co. for construction of floating dock here has been signed.

Naufrage Pond, P.E.I.

Tenders called for extension to breakwater. Owner, Department of Public Works, Ottawa; secretary, R. C. Desrochers. Extension to breakwater and deepening entrance. Plans, etc., at department and at office of J. B. Hegan, district engineer, Charlottetown, P.E.I., and on application to local postmaster. Tenders received by secretary until 4 p.m., August 28th.

Nanaimo, B.C.

Two bridges on the South Forks pipe line were destroyed by fire, length, f.om 100 to 120 feet.

Norway Bay, Pontiac Co., Que.

Tenders called for wharf. Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers. Construction of wharf. Plans, etc., at Department and on application to postmasters at Pembroke, Ont. and Norway Bay. Tenders received by secretary until Aug. 28th.

Ottawa, Ont.

Tenders called for railway ties and switch ties. Owner, Department of Railways and Canals, Ottawa. A. W. Campbell, Chairman, Govt. Railways Managing Board. Purchasing Agent, Mr. Louis Lavoie, Ottawa. Supply of ties and switch ties for the Intercolonial Railway. Specifications, etc., at stations after August 9th. Tenders received by Purchasing Agent until August 31st.

Park Hill, Ont.

The town of Park Hill will call for tenders August 21, on a small cement bridge, value $400. John A. Laughton, Town Clerk, Park Hill, Ont

Quebec, Que.

Tenders called for removal of old bridge material. Owner, Department of Railways and Canals, Ottawa. Secretary, L. K. Jones. Removal of unused material intended for use in connection with construction of old bridge. Specifications at Department and at office of Board of Quebec Bridge Engineers, Canada Express Building, Montreal and Quebec. Tenders received until Aug. 21st, by L. K. Jones.

St. John, N.B.

St. John Street Railway have called for a new set of tenders for car barns, the previous tenders for which closed July 31. New tenders close August 7.

Tilbury, Ont.

Tenders to be called for bridges. (over 6 and 7 side row drain). Owner, Corporation of North Tilbury; J. A. Tremblay, Tp. clerk, Tilbury. Cement and steel; two highway bridges, 10 ft. x 16 ft. clear; one 12 ft. x 16 ft. clear; one 12 ft. x 64 ft.; 4 farm bridges 10 ft. x 14 ft. clear; 3 12 ft. x 14 ft. clear and a cement wall to protect the highway 366 ft. long. Gravel and sand near at hand. Town engineer's estimate, $3,770.

Three Rivers, Que.

Tenders called for steel bridge. Owner, City of Three Rivers. City Engineer, Benj. Bourgeois, 174 Notre Dame street. Secy.-treas., L. T. Desaulniers. Erection of a steel bridge with two concrete abutments on River St. Maurice. The span to be 200 ft. in length. Plans, etc., at office of city engineer. Accepted cheque for 10 per cent. of amount of tenders to accompany each tender. Tenders received until 4 p.m. Aug. 25th.

Vancouver, B.C.

The Canadian Northern Railway have altered their plans, which now provide for three new bridges, one across the Thompson river, two miles above Lytton, and two miles across teh Fraser.

West Advocate, Cumberland, Co., N. S.

Tenders called for breakwater. Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers, Ottawa. Construction of breakwater. Plans, etc., at Department and at office of C. E. W. Dodwell, District Engineer, Halifax, N. S. E. G. Millidge, District engineer, Antigonish, N. S., on application to the postmaster at West Advocate, N. S. Tenders received until 4 p.m. August 30th by secretary.

CONTRACTS AWARDED

Montreal, Que.

The contract has been awarded for freight shed on Morean street, $6,000, being erected by the Canadian Northern Railway, to John MacDonald, Toronto.

Port Arthur, Ont.

Bridge. Owner, Canadian Northern Railroad. Contractor, J. A. Whalen, Port Arthur. Bridge 59 miles east from Port Arthur.

Port Arthur, Ont.

Grading. (Port Arthur to Sellwood) Owner, Canadian Northern Railroad, Toronto. General contractor, Foley Bros. Sub-contractors, Stewart & Hewitson, Port Arthur. 5 miles grading.

Port Arthur, Ont.

Breakwater Bare Point, [illegible] district. Owner, Department of Public Works, Ottawa. Engineer, E. B. Temple, Port Arthur; general contractor, Thunder Bay [illegible] Company, Port Arthur; sub-contractor, M. J. Ho-[illegible] 1,200 feet.

Public Buildings, Churches, Schools, etc.

Brantford, Ont.

Contemplated, school, Holmedale District. City clerk, H. F. Leonard. Plans are now being prepared and building will commence as soon as possible.

Burnabay, B. C.

Tenders called for prison farm building. Owner, Public Works Department, Victoria. Engineer, J. E. Griffith, Victoria. Erection of prison farm building. Plans, etc., at office of H. A. Hodgson, Cotton Building, Vancouver; Govt. Agent, New Westminster; and at Department, Victoria. Tenders received until 5 p.m. Aug. 23rd.

Chilliwack, B.C.

The plans for the new post office are in the hands of the postmaster. Building will be two storeys and basement, concrete, 65 x 50.

Copper Cliff, Ont.

Contemplated school. Town Clerk, Thomas Stoddart. Owner, Public School Board. The Board will take into consideration the erection of a 10 or 12 room public school at their next meeting.

Dunnville, Ont.

Work in progress for high school, $35,000. Owner, Board of Education. Architect, Munro & Meade, Chancery Chambers, Hamilton. General contractor, R. Bennett, Dunnville. 2½ storeys, 100x90, brick, steel, stone foundation, slate roof, cut stone, reinforced concrete, artificial stone, metallic lath, structural iron, ornamental iron, fire escape, sheet metal work, cornice or skylights, interior finish ash, weather strips, electric work. Telephone system, electric bells, electric lighting, steel beams, iron columns, plate glass. Sub-contracts to be let.

Edmonton, Alta.

By-law to raise $55,000 for nurses' home was approved, but that to raise $30,000 for street paving was defeated.

Hamilton, Ont.

Equipment required for hospital building. Owner, Board of Governors, Hamilton. A decision was reached to purchase one feed and two vacuum pumps for boilers.

Justice, Man.

Tenders being called for school. Owner, Board of Trustees, of District No. 696. Secy.-treas., I. J. Pentland. 2 storey and basement, brick veneer school. Plans, etc., at office of Mr. W. W. Blair, architect, Winnipeg; Barclay & O'Hara & McDiarmid & Clark, Brandon, and with T. J. Pentland, Justice. Tenders received by sec.-treas. until Aug. 14th.

Montreal, Que.

The Calvary & Bethlehem Congregation of Montreal will erect a church and house on Dorchester street, Westmount, one storey, stone, concrete foundation, hot water heating, electric lighting, slate roofing, cement work, cut stone, brick, tile, reinforced concrete, structural and ornamental iron, electrical work, iron columns, plate glass.

Ottawa, Ont.

Tenders called for cloak room, Rideau Hall. Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers. Construction of a cloakroom, Rideau Hall, Ottawa. Plans, etc., at the Department. Tenders to be accompanied by accepted cheque for 10 per cent. of amount of tender. Tenders received by secretary until 4 p.m. Aug. 14th.

Oakwood, Ont.

A Methodist Church costing about $12,000 will be built next year. Plans are well matured and $9,000 has been subscribed.

The Township of Mariposa will build a public school in Oakwood next year. Apply J. B. Weldon, Township Clerk, Oakwood, Ont.

Strathroy, Ont.

Tenders called for re-construction of church. Owner, Baptist Church, Strathroy. Chairman Building Committee, David Evans, Strathroy. Recontsruction of interior of Strathroy Baptist Church. Plans, etc., at office of the chairman. Tenders received by chairman until noon, Aug. 14th.

Saskatoon, Sask.

Competitive plans called for church, $75,000. (Spadina Crescent). Owner, St. John's Parish. Architect, Not yet chosen. Competitive plans will be called for at once. A rectory costing $13,009 is also under consideration.

Toronto, Ont.

H. Bryan Gilbert, architect, 47 Wellington street east, is preparing plans for alterations to St. Barnabas Episcopal Church, Halton street.

Newdale, Man.

Tenders called for heating for school. Owner, Municipality of Newdale; architect, W. A. Elliott, Brandon, Man. Secretary, treasurer Harrison School District, C. Johnson. Installation of hot air heating system. Tenders received by secretary-treasurer until August 12, 1911.

Victoria, B.C.

Permit applied for building of a rink, Cadboro road and Empress street. Owner, Patrick Bros., 615 Pender west, Vancouver; architect, Thos. Hooper, 1108 Government street, Victoria. Frame, 322 x 144. Plans approved by Reeve of Oak Bay.

Winnipeg, Man.

Tenders on site for new exhibition grounds. Owner, City of Winnipeg. City Clerk, C. T. Brown. 150 acres to be purchased as a site for exhibition grounds for city. Tenders received until Aug. 21st by city clerk. By-law on purchase to be submitted in December.

Westville, N. S.

Tenders called for Y. M. C. A. Owner, Y. M. C. A. Secretary, J. W. Sutherland. For further information apply to secretary. Tenders were received by secretary until August 12th, 1911.

Windsor, Ont.

Plans to be prepared for public school building, $40,000. Owner, Windsor Board of Education; Alexander Black, secretary; architect, none employed yet. Competitive plans. Authority given by Board of Education Aug. 8th to property committee to secure competitive plans for 8-room school in east end of city. The building to be completed not later than Easter, 1912, and probably sooner.

CONTRACTS AWARDED

Belleville, Ont.

Two schools. Owner, Board of Education, Belleville. Architects, Ellis & Connery, Manning Chambers, Toronto. General contractor, G. A. Bennett, Belleville, Ont. Contract awarded Aug. 7th.

Chatham, Ont.

School, $30,000. (Queen street). Owner, Board of Education, Chatham. Architect, Jas. L. Wilson, Chatham. General contractor, Geo. W. Rayment, Chatham. Carpentry contractor, Geo. W. Rayment, Chatham. Masonry and cement, W. H. Draper, Chatham; Plastering, A. Blonde, Chatham; sheet metal, Western Sheet Metal Co., Chatham; iron work, Park Bros., Chatham; stone work, Jas. A. Oldershaw, Chatham; heating and plumbing contract not yet awarded. Contract let Aug. 9th. Building to be completed July 1, 1912.

Guelph, Ont.

Winter Fair building. Architect, W. A. Mahoney, Guelph. General contractor, Cowan & Walker, Guelph; mason, Cowan & Walker, Guelph; carpentry, Cowan & Walker, Guelph; Cement contractor, Johnston & Williams, Guelph; heating contractor, Howard Bros, Guelph; plumbing contractor, Fred Smith, Guelph; sheet metal, Pedlar Co., Oshawa; iron work, Pedlar Co., Oshawa; stone work, Cowan & Walker, Guelph.

Hamilton, Ont.

The contract for installation of heating and plumbing in the Caroline street school has been awarded to Adam Clark, Main street west, Hamilton.

Kingston, Ont.

G. W. Lakins, Moscow, Ont., has been awarded the contract for erection of Sydenham High School, $8,690. Architects, Power & Sons, Kingston.

Megantic, Que.

Church, $90,000. Owner, Roman Catholic Church, Lake Megantic. Architect, L. N. Audet, Sherbrooke, Que and J. A. Godin, 229 St. Denis street, Montreal, Que. General contractor, D. Viallancourt, 197 First avenue, Ville Emard, Montreal. Cut stone, brick and terra cotta, electric lighting, art glass, asbestos shingle. Building to be completed April, 1913.

Newboro, Ont.

John R. Kerr has been awarded the contract for erection of the new Holiness Movement Church, seating capacity, 200.

Ottawa, Ont.

Incinerator, $34,650. Owner, City of Ottawa; city clerk, T. Henderson; city engineer, N. T. Ker. Successful contractor, Laurie & Lamb, Board of Trade Bldg., Montreal. Heenan-Froude type, 75 ton per 24 hours, top feed type plant, improved patent, six cell refuse destructor.

Saskatoon, Sask.

Y. W. C. A. building, $30,000. (64th street). Owner, Y. W. C. A. Sec., Miss S. Little, Toronto. Architect, Thompson, Daniel & Colthurst. General contractor, McDiarnied & Co., Winnipeg. 3-storey and basement, reinforced concrete construction, ornamental iron, brick with terra cotta.

Stratford, Ont.

The contract for St. Andrew's Church has been awarded to J. L. Youngs; plumbing and heating to McDonald & Henry; architect, J. S. Russell.

St. John, N. B.

Mortuary Chapel, $4,000. (Fernhill cemetery). Architect, G. Ernest Fairweather, St. John, N. B. Contractor, R. Maxwell, St. John. Chapel, 12 x 25 ft.,brick with stone trimmings. Work to commence at once.

Trail, B. C.

School. Owner, School Board; Sec., F. E. Dockerill, Trail. Architect, A. Carrie, Nelson. General contractor, John Burns & Sons, Nelson, $36,455. Heating, B. C. Plumbing Co., Nelson, $4,908.

Vancouver, B. C.

Wing General Hospital. (10th to 12th street). Owner, General Hospital Building. Geo. Haddon, secy., Vancouver. Architect, Grant & Henderson, Williams Building, Vancouver. General contractor, McDonald & Wilson, Howe & Robson streets. 3 storeys and basement, stone and concrete wing. Heating and ventilating let separately. Excavation has been started.

Winnipeg, Man.

Fire hall, $20,000. (Cor. Cathedral and Powers). Owner, City of Winnipeg. Architect, A. & W. L. Mellville, 405 Builders Exchange. General contractor, Sutherland Construction Co., Winnipeg. 2-storeys, brick and stone, stone foundation ,steam heating, electric lighting, shingle roofing.

Residences

Dartmouth, N. S.

Tenders closed for residence. (Mount Hope). Owner, Public Works and Mines Department, Halifax, N. S. 3-storey, 336 x 103, brick, concrete foundation, electric lighting, slate, tar and gravel roofing, reinforced concrete, structural iron, dumb waiter, metal ceiling, pipe covering, telephone system, electric bells, sheathing and deafening paper, steel beams, iron columns, iron stair case. Kinnear steel doors.

Digby, N. S.

Contemplated residence, $3,000. Owner, Mrs. L. H. Morse, Digby, N. S. Wood, stone and concrete foundation, wood roofing. No tenders to be called. J. F. Brent, Middleton, will probably be given the contract. Work to begin in two or three weeks.

Halifax, N.S.

J. Wright will erect a $1,000 residence on Young street, 2 storeys, 18 x 22 x 20, wood, concrete foundation, tar and gravel roofing, cement work, fireproofing, weather strips, asbestos materials.

Hamilton, Ont.

Plans being prepared for residence, $7,000. (Ravenscliffe avenue). Owner, W. E. Phin, Welland. Architect, Munro & Mead, Chancern Chambers, Hamilton. 2½ storeys 80 x 40, brick and stone, stone foundation, green slate roofing, steam heating, electric lighting, cut stone, electric bells, art glass.

Maisonneuve, Que.

Buildings contemplated or in progress: Joseph Corbeil, for three flats, $5,000, brick, 21 x 100, three storeys, cement foundation, gravel flat roof; C. Demontigny, for three flats, $6,000, stone, 25 x 102, three storeys, cement, flat roof; L. Bourdon, for three flats, $4,500, brick, 25 x 100, three storeys, cement, flat roof; the School Commission of Maisonneuve for extension, $4,000, architect, Ch. A. Reeves, 85 St. Jacques street, contractor A. Marchersault, stone, 45 x 60; Andre Bernier, 244 Pie street, for sir flats, $7,999.99, 24 x 80, three storeys, cement, flat roof; H. Lareau, 360 Adam street, for three flats, $5,000, 25 x 100, three storeys, cement, flat roof; A. Gendron, UY William David street, four flats, $8,000, cement, flat roof.

Montreal, Que.

A. Paris will erect two residences on Hamilton street, threestoreys, 40 x 38, brick, cement foundation, R. C. Harbonneau, 1845 Notre Dame west, architect.

Sherbrooke, Que.

Tenders called for residence, $4,000. (Prospect street). Owner, M. B. Echenberg, Sherbrooke. Architect, T. W. Gregorie, Sherbrooke. 2 storeys, wood and brock, stone foundation, iron roof, interior finish, wood, electric lighting. Tenders were called until August 10th.

Saskatoon, Sask.

Specifications in progress for residence, $15,000. Owner, Frank P. Martin, 21st street, Saskatoon. Three stys., terra cotta and stucco work. Date of calling for tenders not decided yet.

Toronto, Ont.

Dwelling, $6,000, 89 Balmoral avenue. Owner, Edward Eyre, 87 Balmoral avenue, Toronto; architect, J. H. Galloway, Toronto street, Toronto. Two and one-half stys., 36 x 21, brick, stone foundation, hot water heating, shingle roofing. Work will be done by day labor.

Specifications prepared for residence, $2,500. (Duggan avenue). Owner, R. T. Robinson, Toronto. Architects, F. Page, 207 Confederation Life Building, Toronto. Two stys., 22 x 44 ft. 9 in., brick, brick foundation, electric lighting, shingle roofing. Tenders called by Owner.

Specifications prepared for residence, $3,500, north side Westminster avenue. Owner, J. A. Egan, 343 Crawford street, Toronto. 2½ storeys, brick, brick foundation, hot water heating, electric lighting, slate and shingle roofing, cement work, brick, tile, mantels, electrical work, plate glass. Work will be done by day labor.

Specifications required for alterations to residence, $3,500. Owner, F. A. Prime, 413 Markham street, Toronto; architect, Sproat & Rolph, 90 Yonge street, Toronto. General contractor, W. Hughes, Simcoe street, Toronto. 2 storeys, brick, stone foundation, hot water heating, felt and gravel roofing, cement work, cut stone, skylights.

Specifications prepared for residence, $2,500. (Dundas street). Owner, Sam Slatski, Maria street, Toronto. 2 storeys, 22 x 34, stone and brick, stone foundation, hot air heating, electric lighting, shingle roofing, cement work, cut stone, brick, tile, mantles, electrical work. Work will be done by day labor.

Work in progress for alteration to residence, $4,000. (W. S. Queen's Park, Toronto. Owner, E. R. Woods, Toronto. Architect, Sproat & Rolph, 90 Yonge street, Toronto. General contractor, W. Hughes, Simcoe st., Toronto. Two storeys, brick, brick foundation; hot water heating, slate roofing.

Tenders to be called for pair dwellings, $4,000, south side Strathcona avenue. Owner, A. E. Furnston, 39 Grafton avenue, Toronto; architect, P. H. Finney, 43 Victoria street, Toronto. Two stys., 38 x 32 ft. 8 in., roughcast, brick foundation, hot air heating, shingle, felt and gravel roofing. Tenders to be called next week.

Tenders to be called for dwelling and warehouse, $3,000, College and Dufferin. Owner in trust, Thos. Hancock, 836 Dovercourt road, Toronto. Two stys., 44 x 20, brick, stone foundation, hot water heating, electric light, open plumbing, felt and gravel roofing, cement work, brick, tile, mantels, structural iron. Tenders to be called shortly.

Tenders called for residence, $8,000. (Law street). Owner, W. R. Sheppard, Toronto; architects, Ellis & Connery, Manning Chambers, Toronto. 50 x 38, brick, stone foundation, hot water heating, slate roofing, cement work, cut stone, brick, tile, mantels, artificial stone, metallic lath, electric work, plate and art glass. Tenders closed August 10th.

Tenders called for addition to residence. (74 St. George street). Owner, Mrs. Stevenson, 74 St. George street, Toronto. Architect, Allen George, 74 George street, Toronto. 2 storeys, 24 x 16, brick foundation, hot water heating ,electric light, felt and gravel roofing, hardwood floor, cement work, brick, steel beams. Tenders will be open for about a week.

Specifications prepared for pair dwelling, $3,800. (Dundas street). Owner, J. Casselman, Dundas street, Toronto Architect, Thos. A. Fleming, 94 Law street, Toronto. 2 storeys, 30 x 43, stone and brick, stone foundation, hot air heating, electric lighting, shingle, felt and gravel roofing, cement work, cut stone, tile mantles. Work will be done by day labor.

Tenders to be called for apartments, $15,000, 865 College street. Owner, J. W. Ellis, 21 Howard street, Toronto; architect, P. H. Finney, 43 Victoria st., Toronto. Three storeys, 28 x 80, brick, brick foundation, steam heating, electric lighting, felt and gravel roofing, cement work, brick, terra cotta, tile, fireproofing, reinforced concrete, fire escapes, steel beams. Tenders to be called next week.

Tenders to be called for apartments, $50,000, near southwest corner Brunswick and Bernard. Owner, Edith F. Williams, 43 Kendall avenue, Toronto; architect, C. S. Williams, 43 Kendall avenue, Toronto. Two stys., basement and sub-cellar, 90 x 110, stone, concrete and brick, stone foundation, steam heating, electric lighting, felt and gravel roofing, interior finish hardwood floors, steel beams. Tenders to be called shortly.

Vancouver, B.C.

Tenders are called for a new apartment house to be erected for Mrs.

Snyder, on Keifer street. Building to be two storeys, frame, concrete foundation, tar and gravel roofing, electric lighting, sheet metal work. Campbell & Dawson, Exchange Building, architects.

Winnipeg, Man.

Tenders called for apartment block, Furby street. Owner, Mrs. C. Gerry; architect, Hooper & Hooper, 303 McIntyre Block, Winnipeg. Stone and brick. Tenders received by architect until August 17th for all trades except heating and plumbing.

CONTRACTS AWARDED

Moncton, N. B.

Parsonage (Queen street). Owner, Trustees of the Central Methodist Church. Architect, Neil Brodie, St. John. General contractor, Humphray & Donald, Moncton, N. B. 2-storey, 40 x 40.

Business Buildings and Industrial Plants

Berlin, Ont.

Excavation is started on the new factory on Victoria street in which soap polishes and German chemicals will be manufactured. Building, two storeys and basement, 36 x 64. Henry Dozenroth has the contract for excavation.

Chatham, Ont.

It is announced that a beet factory will be erected here by the Dominion Sugar Company, which has factories in Berlin and Wallaceburg. The city has given free site, etc. D. A. Gordon, managing director.

Dauphin, Man.

Tenders called for land titles office. Owner, Department of Public Works, Winnipeg; town clerk, J. W. Johnson; Minister of Public Works, H. Rogers, Winnipeg. Construction of land titles office. Plans, etc., at office of Provincial Architect, Fort Garry Court, Winnipeg, and at office of clerk. Tenders received by H. Rogers, until August 16.

Gull Lake, Sask.

Tenders called for bank building. Owner, Merchants Bank of Canada. Manager, W. J. Dromgole, Gull Lake. Plans, etc. at office of Bank at Gull Lake. Tenders received until noon, August 15th.

Hamilton, Ont.

Contemplated addition to plant. Owner, Otis-Fensom Elevator Co., Traders Bank Building, Toronto. An addition to machine shop in Hamilton, under consideration.

Equipment required for printing plants. Owner, Hamilton "Herald" and "Spectator." Additions being erected to both plants. Belting and linotype machines required.

Machinery required for auto manufactory. Owner, Schnacht Auto Co., Cincinnati, Ohio. Engineer, J. Innes, Poplar avenue, Hamilton. About $100,000 will be spent in machinery for manufacturing autos. Tenders called privately, received by T. Innes. No date settled. Canadian branch established here.

Contemplated addition to factory. (Wellington street N.) Owner, Sawyer, Massey Co., Wellington street, Hamilton. Architect, Stewart & Witton, 7 Hughson street, Hamilton. Two new additions to present buildings decided on. Architect will be instructed to draw up plans soon. Firm makes agricultural implements and will require wood and steel working machinery, belts, etc.

Tenders to be called for factory, $50,000. (Victoria avenue, N.) Owner, Otis-Fensom Elevator Co., Toronto. Architect, Stewart & Witton, 7 Hughson street, Hamilton. 1 storey, 237 x 74, brick and steel ,stone foundation, steam heating, electric lighting, tile roofing, cement work, brick tile, fireproofing, armored and reinforced concrete, structural iron, sheet metal, cornice, skylights, roofing, sheathing and deafening paper, steel beams, machinery. Tenders received after five days.

Kamloops, B. C.

Site purchased for telephone exchange. (Third street). Owner, The B. C. Telephone Co., Vancouver. 2-storey brick, mill construction. Dimension of site, 150 depth x 50 frontage. Modern equipment to be installed.

Listowel, Ont.

A whitewear company, capitalized at $40,000, and an electrical company, capitalized at $100,000, are negotiating with a view to locating here. The following have been appointed on the committee to look into the matter: Messrs. J. W. Scott, J. Campbell, J. H. Gunther, J. N. Hay, J. C. Hay, W. Climie, D. Roy, J. M. Schinbein and J. Watson.

Montreal, Que.

J. A. Gerard, 923 Mt. Royal, will erect two stores and house on Papineau avenue, to cost $5,900.

Messrs. Wetmore & Warren, of New York, are the architects for the new Carlton Hotel, which is to be erected at the southwest corner of Sherbrooke and Drummond streets. Excavation work has already begun.

New Toronto, Ont.

Contemplated addition to factory. Owner, Ritchie & Ramsay, Ogilvie Building, Toronto. Plans are being prepared for addition to factory.

Quebec, Que.

Tenders called for offices. Owner, Quebec Central Railway. Sherbrooke, Que. General Manager, J. H. Walsh. Architect, R. P. Lemay, Que. Wood, brick, metal roof, interior finish wood, hot water heating, electric lighting. Plans, etc., with architect. Tenders to accompanied by accepted cheque, payable to J. A. Walsh, equivalent to ten per cent of amount of tender and to be addressed to same. Tenders received until August 23rd.

St. Thomas, Ont.

Specifications prepared for addition to factory. Owner, Monarch Knitting Co. 3-storey, 140 x 70. Estimated cost $60,000. Company supervising construction. Factory to be used for worsted spinning. Machinery ordered in England.

Toronto, Ont.

Tenders to be called for office building. (E. S. Yonge street). Owner, R. S. Williams & Son, Toronto. Architect, Chapman & McGiffin, 59 Yonge street, Toronto. 10-storey, reinforced concrete. Tenders received in about three daye.

Contemplated, four stores and dwelling, Broadview avenue. Owner, W. W. Hiltz, Broadview avenue, Toronto; architect, P. H. Finney, 43 Victoria street, Toronto. Two and one-half storeys, 70 x 70, brick, brick foundation, felt and gravel roofing. Work will be done by day labor.

Tenders called for brewery, Don Esplanade. Owner, Reinhardt Salvador Brewery, Limited, River and Mark sts., Toronto. Architect, F. H. Herbert, 65 Adelaide street east, Toronto. Galvanized iron work, roofing, painting and glazing required in erection. Plans, etc., at offce of architect. Tenders received until 5 p.m., August 17th.

Vancouver, B. C.

Plans prepared for bank. (Kitsilano 4th and Yew streets). Owner, Eastern Townships, Quebec. Architect, A. Cox Carter, Cotton Building, Vancouver. 1 storey, 25 x 75, brick and stone trimmings.

L. B. de Laitte contemplates the building of a factory for the manufacturing of a gas-making apparatus. A syndicate has been formed and headquarters established on Seymour street.

Plans filed for addition to plant. (First and Pine streets). Owner, National Biscuit and Confection Co., (formerly Haida Confectionery Co.) Architect, Claude P. Jones, 429 Pender W., Vancouver. 3 storeys, brick.

Work in progress for store and apartment, Victoria Drive. Owner, Peter Torrance; architect, Smith & Goodfellow, 301½ Hastings street west, Vancouver. Two storeys, frame, furnace heat., electric wiring and hard wall plaster.

Plans prepared for warehouse, (Hamilton street). Owner, J. A. Conkey, Dominion Trust Building. Architect, R. A. Nicolars, 415 Pacific Blk. Consulting engineer, Brown & McKinley, Pacific Blk. 5 storeys, 120 x 50 ft. brick, mill construction, concrete foundation, paving partly plastered, hot water heating. Tenders are being called.

Plans prepared for building. (Gore street). Owner, Salvation Army. 6 storeys, steel frame, reinforced concrete walls and floor, passenger elevator, steam heating, hard wall plaster, tar and gravel roofing, electric wiring and King cement. Gymnasium is included in the plans. Plans prepared by G. Miller, James and Albert streets, Toronto. Tenders called shortly.

Windsor, Ont.

Plans being prepared for factory addition, $5,000. (Sandwich streetW.) Owner, Frederick Stearns & Co. Architect, Crane & Pennington, Windsor, Ont. Brick building, 40 x 43 ft., adjoining present laboratory of Frederick Stearns & Co., to be remodelled. New Front, additional storey to be built, interior to be made, mill construction throughout. Tenders to be called in about a week.

CONTRACTS AWARDED

Brantford, Ont.

Stores and offices, $10,000. Owner, W. F. Cockshutt, Brantford. Architect, Geo. W. Hall, Brantford. General Contractor, P. H. Secord & Sons, Brantford. 2 storeys, 56 x 70, pressed brick and stone faced, concrete foundation, hot air heating, electric and gas lighting, 2 vaults, passenger elevator. Heating and plumbing contract not yet let.

Calgary, Alta.
Office building (Lougheed Block). (First street W.) General contractor, McNeil & Trainer, Calgary. Six stys., brick, terra cotta, steel, fireproof, reinforced concrete floors, passenger and freight elevator, vacuum cleaning, 15 stores on ground floor and above about 156 offices. McNeil & Trainer have also contract for theatre being erected in conjunction.

Hamilton, Ont.
The contract for stone work in connection with store for E. Ruddy, Hamilton, has been awarded to G. Rischie; that for iron work to Hamilton Bridge Works; architects, Munro & Mead, Hamilton.

Factory, (Stanford and Wilson). Owner, Tallman Brass Co. Architect, Stewart & Witton, Hughson street S. General Contractor, W. H. Cooper, 197 Emerald street N., brick and steel, stone foundation, steam heating, electric lighting, Careys roof, cement work, structural iron, sheet metal work, skylights, steel beams, iron columns, roofing, wire glass, area gratings, one 75 h.p. boiler. Sub contracts to be let.

Montreal, Que.
The contract has been awarded to George A. Fuller Co., Ltd., Jacobs Building, Montreal, for an hotel being erected at 584 Sherbrooke street, by the Carlton Hotel Company.

St. John, N. B.
General Contract awarded for brick block. (Union and Brussels streets). Owner, Bishop Casey, St. John. General contractor, A. R. C. Clark, St. John. 3-storey and five tenements, 68 ft. on Brussels, 48 on Union and 62 feet depth. Contract awarded on Aug. 7th.

St. Thomas, Ont.
Addition to factory, $15,000. Owner, Monarch Knitting Co. General contractor, A. E. Ponsford, St. Thomas; brick and steel construction 130 x 70.

Toronto, Ont.
Addition to factory, $2,500, Wellington street east. Owner, Albert Kleiser, Wellington street east, Toronto; architect, Page & Warrington, 207 Confederation Life Bldg., Toronto. Two stys., 36 x 23, brick, felt and gravel roofing, interior finish maple flooring. General contractor, Chalkley & Son, Janes Bldg., Toronto.

Winnipeg, Man.
J. F. Graham has been awarded the contract for the erection of a terrace of seven stores on Portage avenue between Good and Balmoral streets, for W. T. & F. H. Alexander. Cost, $15,000.

Business Building, (Portage avenue). Architect, T. D. Atchison. General contractor, Kelly-Simpson ConstructionCo., Winnipeg, $230,000. Reinforced concrete. Work is expected to commence at once.

Office building, $130,000. (Notre Dame, Garry and Ellice streets). Owner, Frank Lindsay; architect, T. Woodman, Winnipeg. General contractor, Kelly-Simpson Construction Company, Winnipeg. Seven stys., brick and cement, terra cotta facings. Work is expected to start at once.

Five stores, $20,000. (Main and Redwood avenue). Owner, E. McKenty, Winnipeg. Architect, Frank R. Evans, 506 Somerset Block, Winnipeg. General contractor, Metheson & Gay, 221 Higgins street, Winnipeg. 2 storeys, 60 x 108, brick and stone, concrete foundation, tile floors, interior finish metal and plaster.

Power Plants, Electricity and Telephones

Calgary, Alta.
Tenders called for pump and electric motor. Owner, City of Calgary; city clerk, W. D. Spence. Supply and erection of pump and electric motor in place of five million imp. gal. pump. The pump to be centrifugal and attached to a 500 h.p. electric motor with switchboard complete. Suction, lift of pump 12 ft., delivery to be continuously efficient to maintain pressure in the mains 125 lbs. per square inch. Tenders received by clerk until August 21st.

Kamloops, B.C.
The B. C. Telephone Co. will build here. See "Business Buildings."

Port Stanley, Ont.
By-law carried for purchase of power plant. Owner, City of Port Stanley. By-law carried to raise $12,750 for purchasing Walter Mitchell's electric lighting plant and installing Hydro-electric light and power.

Sherbrooke, Que.
Application for franchise power company. Sherbrooke railway and Power Co. have purchased The North Hatley Electric Light Co. and The Stanstead and Rock Island Light Co. and are now applying to the different municipalities for a franchise for 25 years to sell power and light. Estimated expenditure $75,000. Their object is to furnish power and clear light for a radius of about 30 miles around Sherbrooke.

St. Jerome, Que.
Tenders called for power system. Owner, Municipality of St. Jerome; consulting engineer, DeGaspe Beaubien, 112 St. James street, Montreal. Complete hydro-electric power and distribution system. Tenders received until noon, August 28th.

Winnipeg, Man.
Tenders called for six potential regulators. Owner, City of Winnipeg. Sec. Board of Control, M. Peterson, City Hall, Winnipeg. Specifications at office of Power Construction Department, Carnegie Library building, Winnipeg. Tenders received by Chairman Board of Control, until 11 a.m. August 22nd.

Miscellaneous

Hamilton, Ont.
Contemplated purchase of fire-fighting apparatus. Chairman, Fire, Police and Jail Committee, Ald. Clark. The committee contemplate buying one automobile and motors for fire trucks.

Montreal, Que.
Tenders called for fire equipment. Owner, Board of Commissioners; L. N. Senecal, secretary, city hall. Supply of (a) one automobile truck to haul aerial ladder truck; (b) one auto truck to haul 1,200 gallon steam fire engine; (c) one auto hose wagon to carry 2,000 ft. of 2½-in. cotton, rubber-lined hose,etc.; (d) one combination auto engine of a capacity of 1,000 imperial gallons, to carry also 10,00 ft. of 2½-in. cotton, rubber lined hose; (e) one 1,000 U. S. gallon steam fire engine; (f) one 800 U. S. gallon steam fire engine. Specifications at fire headquarters, Craig west and Chenneville streets. Tenders received by commissioners until August 31st.

Toronto, Ont.
Fire-fighting equipment. Owner, City of Toronto. Contract for motor driven combination chemical engine and hose wagon, awarded to W. E. Seagrave, Walkerville, Ont. The contract for fire alarm boxes and wire and cables for fire alarm telegraph has not been awarded yet. New specifications prepared for hose, see 572B.

Winnipeg, Man.
Tenders called for supply of cement. Owner, City of Winnipeg. City Engineer, H. N. Ruttan, 223 James street, Winnipeg. Sec. Board of Control, M. Peterson, City Hall, Winnipeg. Supply of 20,000 bbls. cement, delivered f. o.b. city yards. Specifications, etc., at City Engineer's office. Tenders were received by Chairman Board of Control until 11 a.m., August 10th.

Building Permits

Calgary, Alta.
The following building permits were issued recently: — Crescent Heights Presbyterians have taken out a permit for a church building to be built in that section of the city. The cost of the edifice is to be $1,200, and it will be a frame building 25 x 41 feet; F. A. MacKenzie, $1,500 house, Sunnyside; E. S. Munro, $2,000 house, Hillhurst; A. Yan, $1,500 house, Second avenue, between Seventh and Eighth streets west; Jas. Robinson, $1,000 house, East Calgary; N. Gallelli, $1,000 house, Bridgeland; J. E. Salter, $2,250 house, Sunalta; C. G. Wyatt, $2,000 house, Bridgeland.

Toronto, Ont.
Freehold Realty Co., one brick store and dwelling, 2-stys., southeast corner Bathurst and Dupont streets, $10,000; C. A. Kennedy, two pair 2-sty. semi-detached brick dwellings, west side Emerson avenue, near Lappin avenue, $6,000; Thompson and Mitchell, 1 brick apartment house, 2-stys., Harbord st., near Montrose avenue, $9,000; J. Gibson, one pair 2-sty. semi-detached brick dwellings, Vanhorne street and Dovercourt road, $5,000; A. D. Petrie, 1 pair semi-detached 2-sty. brick dwellings, south side Millicent street near Emerson avenue, $5,000; R. J. Roger, 2 pair 2-sty. and attic semi-detached brick dwellings, west side Ridley Gardens, near Garden avenue, $9,200; High Park Curling and Lawn Bowling [illegible] brick club house and rink on Indian road, near [illegible] James Sargant, 1 pair 2-sty. semi-de-

(Continued on page [illegible])

Tenders and For Sale Department

Tenders

Tenders will be received by the undersigned until noon, **Monday, August 14th**, for the completion of the clear water reservoir at St. Thomas waterworks. Plans and specifications may be seen and form of tender obtained at the office of the City Engineer.

GEO. K. CROCKER,
Chairman of Board of Water Commissioners.
32-33

Corporation of the City of Three Rivers

Public Notice

Sealed tenders addressed to the undersigned and marked "Tender for Steel Bridge," will be received at the City Hall, Three Rivers, up to the 25th instant at 4 o'clock p.m., for the erection of a steel bridge with two concrete abutments on the River St. Maurice, the span to be of 200 feet in length.

Plans and specifications may be seen at the office of Mr. Benj. Bourgeois, city engineer, No. 174 Notre Dame street.

An accepted cheque for 10 per cent. of the amount of tender must accompany each tender.

The lowest or any tender not necessarily accepted.

L. T. DESAULNIERS,
Sec.-Treasurer.

City Hall, Three Rivers,
August 4th, 1911.
32-34

Department of Railways and Canals, Canada

QUEBEC BRIDGE

NOTICE TO CONTRACTORS

Sealed tenders addressed to the undersigned and endorsed "Tender for Removal of old Bridge Material," will be received at this office until 16 o'clock, on **Monday, the 21st August, 1911**, for the removal of unused material delivered on the ground intended for use in connection with the construction of the old Quebec Bridge.

Specifications, forms of tender and full information can be obtained on and after this date, at the office of the secretary of the Department of Railways and Canals, Ottawa, at the office of the Chairman and Chief Engineer of the Board of Engineers of the Quebec Bridge, Canadian Express Building, Montreal, and at their office, Board of Trade Building, Quebec.

An accepted bank cheque for the sum of $13,000, made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 5th August, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.
32-33

Trench Machines

Parsons—Cuts trench 27 in. to 60 in., to 20 ft. deep, fine order.

Parsons—With Mattes Back Filler, cuts trench 28 in. to 78 in. to 20 ft. deep. Overhauled and first class. Write us if you have anything to sell, or if in want of anything.

THE MALES CO.
No. 82 Perin Building, Cincinnati, O.

Tenders

Tenders will be received by the undersigned until **August 19th, 1911**, for supplying and installing a six-million gallon Centrifugal Pump and Steam Engine. Specifications may be obtained from the City Engineer. Tenders must be plainly marked on the outside.

M. H. BAKER,
City Engineer.

St. Thomas, July 29, 1911.
31-33

FOR SALE

Complete Electric Generating Set, consisting of Leonard Peerless steam engine direct connected to 150 k.w. Canadian General Electric generator, 2,300 volts, 60 cycles; also condenser, switchboard, steam and exhaust piping, spare parts for engine and generator, and everything constituting the complete set as at present installed in the Thomas street lighting station of the Town of Brockville. This machine is in first-class order, having only been used on peak loads. It is now being replaced by a larger Belliss & Morcom engine with Swedish G. E. generator. Full particulars and price can be obtained from Laurie & Lamb, Consulting Engineers, Board of Trade Building, Montreal.
28-35

To Contractors

Separate tenders endorsed "Tender for New Government House," addressed to the undersigned, will be received at this Department until noon of **Tuesday, August 22nd**, for the stone and brick work, fireproofing, steel work, roofing and carpenter work, for the new Government House in Chorley Park, Rosedale, Toronto. Plans and specifications may be seen at this department.

An accepted bank cheque payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender, and the bona fide signatures and addresses of two sureties, must accompany each tender. Cheque will be forfeited to the Crown in the event of the successful tenderer refusing to carry out the work within ten days after acceptance. The department will not be bound to accept the lowest or any tender.

By order,
H. F. McNAUGHTEN,
Secretary Public Works Department.

Department of Public Works, Ontario, Toronto, July 21st, 1911.

Newspapers publishing this advertisement without authority will not be paid for it.
30-31-32-33

TOWN OF BERLIN

Sealed tenders addressed to A. H. Millar, town clerk, will be received up to 6 p.m., **August 17th**, for the construction of a reinforced concrete bridge on Albert street, Berlin. Plans and specifications may be seen at the office of Herbert Johnston, Town Engineer.

The lowest or any tender not necessarily accepted.

H. A. DIETRICH,
Chairman, Board of Works.

Berlin, August 5th, 1911.
32-33

To Contractors

Sealed bids will be received by the undersigned up to noon of **Monday, August 21st**, for all trades required in the erection of a nine-storey, stone, brick, and steel fireproof building in Richmond street west, Toronto.

The lowest or any tender not necessarily accepted.

F. S. BAKER, Architect,
Traders Bank Building,
Toronto

32-33

Department of Railways and Canals

Intercolonial Railway

Passenger Station, Truro, Nova Scotia

Sealed tenders addressed to the undersigned and endorsed "Tender for Truro Station," will be received at this office until 12 o'clock noon, on **Friday, the 25th of August, 1911**, for the construction of a stone Passenger station at Truro, Nova Scotia.

Plans, specifications and form of contract to be entered into may be seen and full information obtained on and after **10th of August, 1911**, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Chief Engineer of the Intercolonial Railway at Moncton, N.B., or at the office of the Board of Trade, Halifax.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $10.-000 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum tender, which sum will be forfeited if the party tendering declines entering into the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, August 4th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.
32-33

Tenders Wanted

Sealed tenders will be received by Messrs. Chapman & McGiffin, 59 Yonge street, Toronto, up to and including **August 30th**, for the various trades required in the erection of a ten-storey warehouse and store to be built at **145** Yonge street, Toronto. 33-33

ST. JEROME

Hydro-Electric System

Tenders will be received until noon, **August 28th, 1911**, for a complete Hydro-Electric Power and Distribution System. Total estimate $60,000. For specifications, apply deGaspe Beaubien, Consulting Engineer, 112 St. James, Montreal. 33-33

MACHINERY BARGAINS

We have for sale for quick shipment from point near Montreal in Canada, several 18-ton saddle back four-wheel contractors' locomotives, and four dozen 4-yard two-way side dump contractors' cars, all 36-in. gauge.

Also one No. 4 Austin gyratory stone crusher with elevator and screen for same.

These items in good condition for immediate service and at attractive prices. For particulars, address

WILLIS SHAW MACHINERY CO.,
39 South LaSalle Street, Chicago, Ill.

Department of Railways & Canals, Canada

WELLAND CANAL

NOTICE TO CONTRACTORS

Sealed tenders addressed to the undersigned and endorsed "Tenders for Turning Basin, Thorold, will be received at this office until 16 o'clock on **Monday, the 21st day of August, 1911.**

Plans, specifications and form of contract to be entered into, can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Superintending Engineer, St. Catherines, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $1,500 made payable to the order of the Minister of Railways and Canals must accompany each tender, which sum tender, which sum will be forfeited if the party tendering declines entering into the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 5th August, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 32-33

Town of North Toronto

TENDERS FOR SEWAGE DISPOSAL WORKS

Tenders are invited for the construction of three separate Disposal Works to be executed under one contract. The work includes the construction of screening chambers, sedimentation tanks and filter beds, together with the laying of inlet and effluent mains, roadways, fencing, etc., and providing and fixing all ironwork.

Copies of the General Conditions of Contract, Specification, Schedule of Quantities, form of tender and contract drawings, may be obtained at the office of T. Aird Murray, 303 Lumsden Building, Toronto, and at the office of the Canadian Engineer, B 32 Board of Trade Bldg., Montreal, on or before 15th of August, upon a deposit of twenty-five dollars ($25.00), returnable on receipt of bona fide tender, together with all plans and documents supplied.

Tenders to be sent under seal not later than 6 p.m., Monday, August 28th, addressed to the Mayor and Members of Council, Eglinton Town Hall.

Each tender must be accompanied by a certified cheque equal to two and one-half per cent. of tender, such cheque to be returned when tender is accepted or rejected.

The lowest or any tender may not be accepted.

T. AIRD MURRAY, Consulting Engineer.
A. J. BROWN, Mayor.
Dated August 11, 1911. 33-33

Department of Railways and Canals

Branch Line of Railway from Dartmouth to Deans.

Sealed tenders addressed to the undersigned and endorsed "Tenders for Branch Line, Dartmouth to Deans," will be received at this office until sixteen o'clock on **Friday, September 15th, 1911.**

Plans profiles, specification and form of contract to be entered into can be seen on and after the 15th instant at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa; at the office of the Chief Engineer of the Intercolonial Railway, Moncton; and at the office of the Board of Trade, Halifax. Forms of tender may be procured from the Chief Engineer of the Department of Railways and Canals or from the Chief Engineer of the Intercolonial Railway.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $150,000, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, August 12th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 32-34

For Sale

One second-hand No. 1 Smith concrete mixer, with engine and boiler complete. Apply to A. J. Cromar, Brantford, Ont. 32-33

CITY OF WINNIPEG

Electrical Distribution System

Tenders for Underground Cable

Sealed tenders on prescribed forms, addressed to the Chairman, Board of Control, Winnipeg, and marked on the envelope "Tender for Underground Cable," will be received at the office of the undersigned up to **11** a.m. on **Monday, August 28th, 1911**, for the manufacture, delivery and installation of underground cable for the electrical distribution system.

Copy of the instructions to bidders, specifications and form of tender may be obtained at the office of the general manager of the Light and Power Department, 449 Main street, Winnipeg.

Each tender must be accompanied by an accepted cheque, at par, payable to the order of the City Treasurer, or cash deposit for the sum called for in the instructions to bidders, which deposit will become forefit to the Corporation in the event of the successful tenderer failing to sign a satisfactory contract when called upon to do so.

The City reserves the right to reject any or all tenders and to accept any bid which appears advantageous.

M. PETERSON,
Secretary, Board of Control.

Winnipeg, Aug. 10th, 1911. 33-33

CITY OF SASKATOON

Storm Sewers and Paving

TENDERS WANTED

Sealed tenders, addressed to the City Commissioners, Saskatoon, and marked as to contents, will be received up to 12 o'clock noon on **Friday, August 18th, 1911**, for the following work and materials, viz.:—

Contract No. 97.—All labor necessary for laying pipes, and furnishing certain materials, according to the following quantities:—

1,080 lin. ft. 15-in. vitrified tile pipe.
2,150 lin. ft. 12-in. vitrified tile pipe.
1,760 lin. ft. 10-in. vitrified tile pipe.
6,840 lin. ft. 8-in. vitrified tile pipe.
2,865 lin. ft. 8-in. vitrified tile pipe.
(catch basin branches)
2,205 lin. ft. 42-in. reinforced concrete pipe.

Contract No. 98.—Furnishing 2,205 lineal feet reinforced concrete sewer pipe; and 6 reinforced concrete manholes, 42 in. in diameter.

Contract No. 99. Furnishing 40 manhole frames and covers, and 92 catch basin gullies.

Contract No. 100. -Laying approximately 21,600 square yards of pavement, and grading incident thereto.

Plans, specifications, instructions to bidders, general conditions, and forms of tender may be seen at the offies of George T. Clark, City Engineer, Saskatoon. Copies of instructions to bidders, and forms of tender will be furnished on application to the City Engineer, but copies of plans and specifications will not be furnished.

The lowest or any tender not necessarily accepted.

[illegible]
[illegible] City Commissioners.
E. M. SNELL,

[illegible] 1911.

TOWN OF AYLMER

Tenders for Pavement

D. C. Davis, town clerk, will receive tenders for about 2400 square yards of Bermudez road [illegible] or vitrified brick pavement up till 6 p.m., **August 20, 1911**, tenders to include grading drains, gutters, etc., to complete the work. Specifications can be seen at the clerk's office, Aylmer.

The work to be commenced at once and pushed through until completed.

The lowest or any tender not necessarily accepted.

F. WOOSTER,
Town Engineer.

A[illegible], Aug. 8th, 1911 33-33

Department of Railways and Canals

Branch Line of Railway from Guysborough to Sunny Brae through Country Harbour Crossroads to Deep Water of Country Harbour.

Sealed tenders addressed to the undersigned and endorsed "Tender for Guysborough-Country Harbor Line," will be received at this office until 16 o'clock, on **Friday, September 15th, 1911**, for section No. 1 of the above line of railway, comprising that portion extending from Guysborough to Country Harbor Crossroads and from the latter point to Deep Water Country Harbor.

Plans profiles, specification and form of contract to be entered into can be seen on and after the 15th instant at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, at the office of the Chief Engineer of the Intercolonial Railway, Moncton; and at the office of the Board of Trade, Halifax. Forms of tender may be procured from the Chief Engineer of the Department of Railways and Canals or from the Chief Engineer of the Intercolonial Railway.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $100,000, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily
By order,

L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, August 12th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be [illegible] 33-34

Miscellaneous

Mixer Wanted

Wanted a second-hand Ransom Concrete Mixer, with or without power. Ed. Conray, 435 Mark street, Peterborough, Ont. 32-33

Tenders for Steel Highway Bridge

Sealed tenders will be received up to noon of **Monday, August 28th, 1911**, for the construction of a Steel Bridge, 62 feet clear span, over Oshawa Creek at the Base Line Road, County of Ontario.

Sealed tenders will also be received at the same time for the construction of abutments, retaining wall and reinforced concrete floor for the above bridge.

Plans and specifications may be obtained from the undersigned, upon deposit of the sum of **$1.00**, which will be returned when plans etc. are returned.

The lowest or any tender not necessarily accepted.

FRANK CHAPPELL,
County Engineer.

Oshawa, Ont., Aug., 1911. 33-34

Positions Vacant

Advertisements under this heading two cents a word per insertion.. Minimum charge 50 cents

WANTED—Structural steel draughtsman, accustomed to detailing simple trusses and general work. Apply Reid and Brown, 63 Esplanade East, Toronto.

WANTED—Engineer with good practical experience in all classes of interior lighting and motor installation. Special duties revising rules and regulations. An engineer with English and European expreience preferred. Apply Box 314, Contract Record, Toronto, Ont. 33-33

Building Permits

(continued from page 63)

tached brick dwellings, at 199 Perth avenue, near Wallace avenue, $4,000; Thomas Royle and Mrs. Alnas, 1 pair semi-detached 2-sty. brick dwellings, west side Symington avenue, near Bloor street, $4,000; Standard Sanitary Mfg. Co., 1-sty. brick and steel factory, Royce and Lansdowne avenues, $18,000; W. H. Brouse, 2½-sty. brick addition to dwelling, 73 George street, $12,000; Wm. J. Nixon, 1 pair semi-detached 2-sty. and attic brick dwellings, north side Dixon avenue, near Rainsford road, $4,200; J. Jennings, 1 pair semi-detached 2-sty. brick dwellings, east side Ritchie avenue, near Dundas street, $5,000; Geo. H. Tucker, 1 pair semi-detached 2-sty. brick dwellings, south side Antler avenue, near Symington avenue, $4,500; Frank Baxter, 1 pair semi-detached 2-sty. brick dwellings, west side Lee avenue, near Williamson road, $4,000; D. Bowerman, 1 pair semi-detached 2½-sty. brick dwellings, west side Woodbine avenue, near Dixon avenue, $4,400; S. R. Robinson, 1 pair semi-detached 2-sty. brick dwellings, Antler avenue, near Symington avenue, $4,000; H. W. Macdonald, 1 brick and stone dwelling, 3-sty., south side Bloor street, near Bathurst street, $6,000; Jesse Smith, 1-sty. frame and galvanized iron hockey rink, Ravina Park, near Ravina avenue, $8,000; A. Fowlds, 1 brick dwelling, 2½-sty., on Crescent road, near Rosedale road, $6,100; Thos. Bink, 1 brick dwelling, 2½-sty., at 694 Broadview avenue, $4,500; A. J. Robinson, 1 pair semi-detached 2½-sty. brick dwellings, Applegrove avenue, near Morley avenue, $4,500; Ed. Knechtel, 1 brick dwelling, 2-sty., on Constance street, near Keele street, $4,600.

Winnipeg, Man.

Recent building permits include: E. J. Thompson, dwelling, Carlaw avenue, $2,500; J. P. Shier, two dwellings, Greenwood Place, $9,300; R. Johnstone, dwelling, Machray avenue, $3,200; W. J. Williams, dwelling, Elgin avenue, $1,400; A. E. Burns, dwelling, Jessie avenue, $6,000; F. C. Allardice, dwelling, Mulvey avenue, $3,000; Dunn and Wallace, dwelling, Canora street, $4,500; Mackissock and Thomas Ltd., three dwellings, Lipton street, $16,500; Midland Railway co., freight sheds, Ross avenue, between Sherbrooke and Isabel, $45,000

New Companies

Builders Limited, Toronto, Ont., incorporated with a capital of $200,000, to carry on a business as contractors, etc., to purchase lease or otherwise acquire timber limits and deal in wood and timber of all kinds. The provisional directors include John Jos. Manuel and Geo. Lang Latimer, both of Toronto.

McCrea & Sharp, Limited, New Liskeard, Ont., incorporated, with a capital of $40,000 to carry on a general land and building business. Provisional directors: John Reuben McCrea and Wilfred Clement Sharp and Francis Louden Smiley, all of New Liskeard.

Niagara Falls Contracting Company, Limited, Niagara Falls, Ont., incorporated, with a capital of $40,000, to carry on a building and contracting business. Provisional directors: Edwin David Lowrey and Fred. Aug. Goring, both of the township of Niagara.

Timmins Townsite Co., Ltd., Toronto, Ont., incorporated, with a capital of $40,000, to erect buildings and deal in builders' supplies, etc. Provisional directors: Geo. Alexander Grover and John Bell Holden, both of Toronto.

The Kennedy Construction Co., Ltd., Montreal, Que., incorporated, with a capital of $250,000. Incorporators, Jas. Kennedy, of La Tuque St., George Harvey, of West Shefford, and Geo. A. Campbell, advocate, of Montreal.

General Realty Corporation, Ltd., Port Arthur, Ont., incorporated, with a capital of $500,000, to carry on a land and building business, dealers in builders' supplies, etc. Incorporators: Jas. Russell Lovett Starr, Jas. H. Spence and Matthew Crooks Cameron, barristers, all of Toronto, Ont.

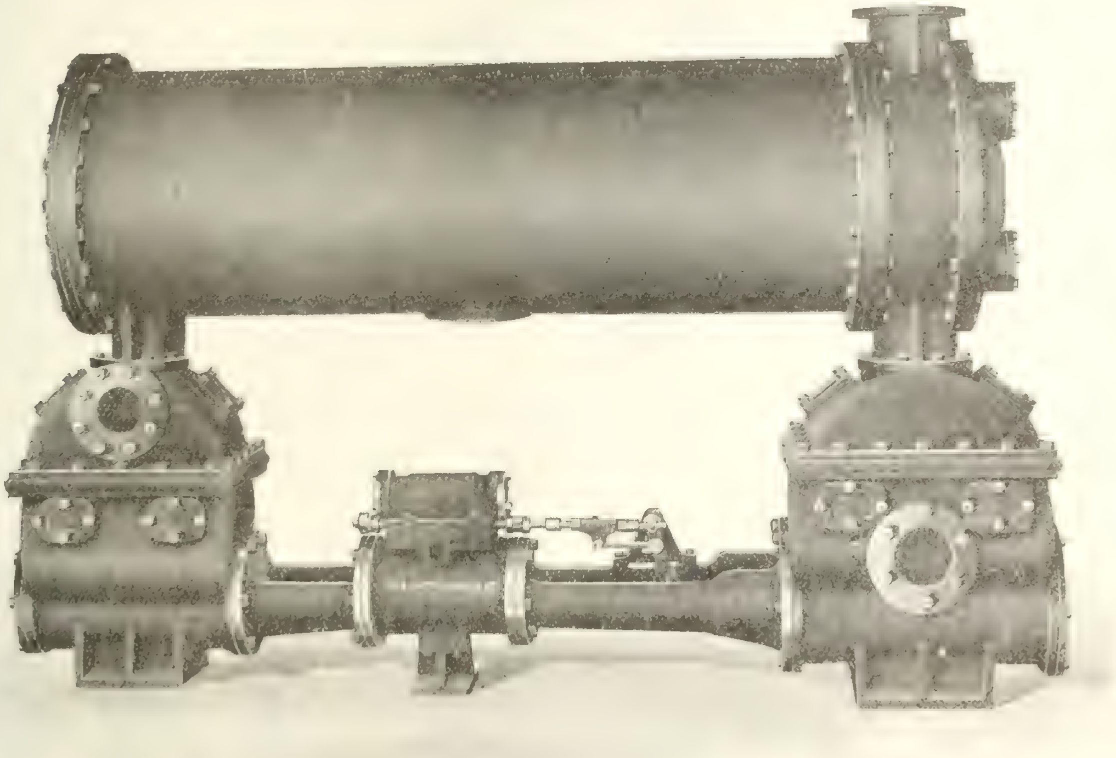
Ensign Realty Co., Ltd., Montreal, Que., incorporated, with a capital of $50,000, to carry on a general building business, dealers in timber building materials, etc. Provisional directors, Edwin Coswill, Albert Astor Boire, and Wm. Alex Cattan, real estate dealers, all of Montreal.

Wascana Building Co., Ltd., Regina, Sask., incorporated, capital $25,000.

Montreal, Que.

The planing mill and sash and door factory owned by J. A. Brien & Co., Craig and Delorimier avenue, was destroyed on the 7th inst. Estimated loss $35,000. The sash and door factory of Messrs. Fevreau & Corveau in the rear damaged to the extent of $15,000.

CONDENSORS



Condensor built by The John Inglis Co., Limited

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

Let us Submit Prices.

The John Inglis Company Limited

Engineers and Boilermakers

14 Strachan Ave., TORONTO, Canada

Vancouver Building

Notwithstanding that the strike which paralyzed the building industry at Vancouver early in June was not called off until the middle of last week, building has been quite brisk and the month's totals pass the million mark again, for the sixth time this year. The prospects for the balance of the year are keeping pace with the earlier months. According to Mr. S. M. Jarrett, Building Inspector, the number of permits issued in July were 226, at a value of $1,108,380. July, 1910, showed a corresponding total of $639,530. The value of building permits issued for the first seven months of the present year in Vancouver amount to $10,296,784, which is over 35 per cent. of an increase over the first seven months of last year.

New Harbor Board Offices

The Montreal Harbor Commissioners' offices at the corner of Common and St. Peter streets, have become too small for the increased staff which is necessary in carrying out the extensive improvements which are being made on the harbor front. Accordingly a new office is being built on the wharf near the No. 1 grain elevator. The corner stone was laid a few days ago by Major G. W. Stephens, chairman of the board. The usual mementos were placed in the stone and the ceremony in this connection was quite interesting. The building is of red brick and will be completed in the course of a few weeks.

Under the new city council procedure by-law at Regina, Sask., no contract for work over $200 in value will be awarded without asking for tenders. This is the principal feature of the by-law and it is one which merits the consideration of every Canadian municipality which has no definite regulation covering this point.

One of the most important points to remember in the installation of lightning arresters is the ground connection. Various methods of making good grounds have been recommended, but the one that appears to give the least trouble is a number of iron pipes in parallel driven into the ground thoroughly moistened with water. A quantity of salt should be placed around each pipe at the surface of the ground. Each pipe should be connected to the iron framework of the station, metal flume, or water mains, or steel penstock; in fact, it is recommended to connect them to any good grounds around the station. The ground connections should be as short as possible, and from time to time the resistance of each ground connection should be measured to determine its condition. Ground connections for arresters should be as short and straight as possible from the arrester to the earth. A poor ground connection will render ineffective any provision for discharging the static electricity to earth. The question of ground connections is one which has been much discussed.

The town council of Raymond, Alberta, has passed a by-law authorizing the raising of a loan of $10,000 for waterworks' extension. A reservoir is to be constructed at the spring, two miles south of the town, for storing water for emergency purposes.

John Whitehead & Co.
LIMITED
Albert Works: PRESTON, ENGLAND
Makers of
Reliable

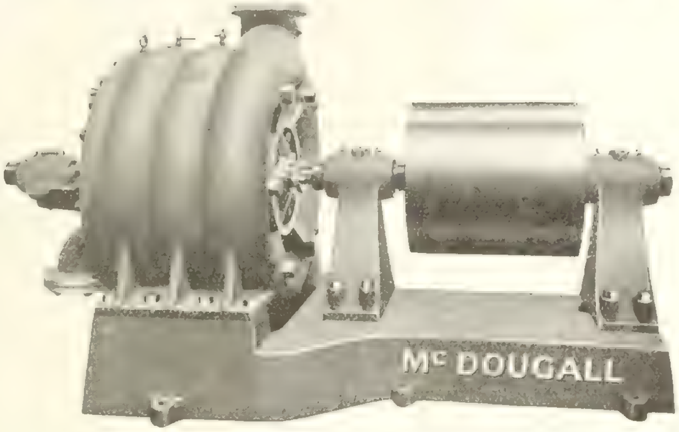
Efficient
Tile and Pipe Machinery, and
CLAY WORKING PLANT
for all classes of Clays and Shales.
INQUIRIES SOLICITED. CATALOGUES POST FREE.
Established over 75 years. TELEGRAMS: Brictile, Preston
Representatives in Canada: —Messrs. Chambers & Simpson, Engineers, Toronto

Instructions for

Operating Turbine Pumps

Although Turbine Pumps are so simple in both construction and operation, it is absolutely necessary to follow a few general rules in order to get the best results. These rules, based on years of manufacturing experience, will be found in

Bulletin 110



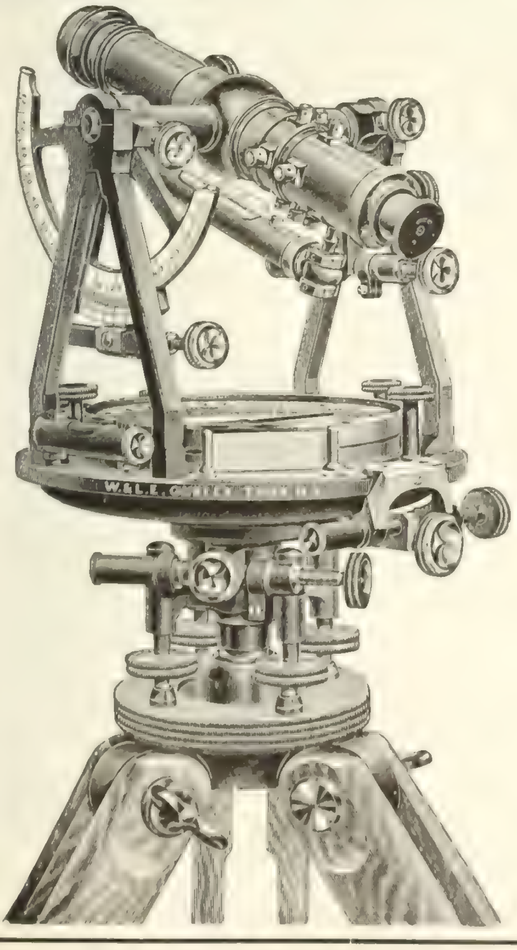
Capacity 868 Imperial or 1,040 U.S. gallons per minute. 150 lbs. pressure. Belted to 100 H.P. motor at 942 r.p.m.

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

LIMITED

WORKS:
512 William St., MONTREAL

SALES OFFICES:
MONTREAL, TORONTO, COBALT, WINNIPEG, CALGARY, VANCOUVER



1845 **1911**

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

Transits
Y Levels
Compasses
Plane Tables

Current Meters
Levelling Rods
Chains
Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

DOORS

Pine and Hardwood Veneer

Interior Finish

Stair Work

Interior Hardwoods

Send us your plans and specifications and let us quote you

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario

NOTICE
to
Architects and Contractors

The Page Wire Reinforcement is now supplied in flat sheets in lengths to order. It is a generally accepted fact that wire reinforcement is superior to any other material for bonding, as, pound for pound, it has at least twice the strength of steel put into any other form. The only objection to wire heretofore being the difficulty of laying it properly, owing to its curling because of having been rolled for shipment.

Owing to our invention of special machinery for the manufacture of the fabric in flat sheets, the only drawback to wire as a reinforcement is now eliminated.

The Page Wire Fence Co., Limited
Walkerville, Ont.
Branches:
Montreal—505-517 Notre Dame St., W. Toronto—Cor. King St. W. and Atlantic Ave. St. John, N.B.,—37 Dock St.

Why Every Engineer Should Specify and Every Contractor Use

CUBE MIXERS

Above all things concrete work must be built to endure. Any weakness in the concrete mass is fatal to the job.

There is only one sure, true method of concrete mixing, but many wrong methods.

Some devices sold as mixers are only separators, You cannot mix ingredients by whirling them around inside a drum or cylinder, no matter how many paddles or shelves and other inside disintegrators the machine may have.

The World Knows No Better Method of Mixing Concrete than the old kneading principle of folding a batch of concrete over itself as is done in a cube mixer, squeezing it together, pounding it against itself this way and that, grinding its particles against each other and smearing the sticky paste composed of the finer particles—all the while changing its shape with 18 different motions to the right and to the left, then forward over and over itself, with ten times as much effectiveness at every rotation of the cube as is possible with three revolutions of the drum-type mixer, which merely whirls it around and separates it as it rotates.

It requires very little investigation to determine which is the true principle of mixing if you will but see the *Chicago Improved Cube Mixer* in operation and compare it with any other method.

MADE IN FOURTEEN SIZES TO SUIT ANY MIXER NEED.

WRITE FOR FREE BOOK NO. 8-H ON SCIENTIFIC CONCRETE MIXING.

Municipal Engineering & Contracting Company
Railway Exchange, Chicago, Ill. New York Office, 30 Church Street
Canadian Equipment & Supply Co., Calgary and Vancouver—Agents for Western Canada.

Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

We are making a

STEEL ROOFING
FOR
FLAT ROOFS

WHICH IS

Fireproof, Watertight, Durable, and Easily Laid

We are having a large sale of it to contractors and others for use on flat-roofed buildings of every description.

Samples and catalogue giving full information will be gladly sent you on receipt of postal-card request.

Corrugated Iron **Metallic Shingles**
Metallic Sidings **Metallic Ceilings**
Etc., Etc.

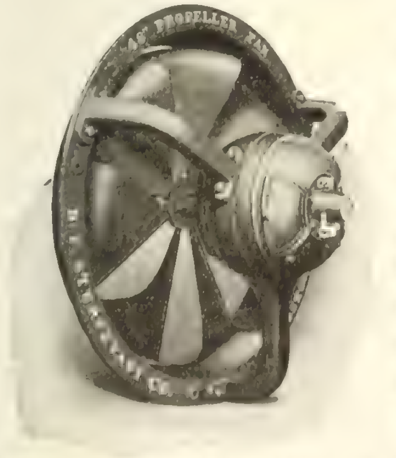
The Metallic Roofing Co.
LIMITED
Manufacturers
TORONTO, ONT. WINNIPEG, MAN.
29

THE REMEDY

FOR THAT HOT AND STIFLING ROOM
IS A

Sturtevant

Electric Propeller Fan



¶ They increase output, reduce sick leave, and raise efficiency of workers by keeping the air fresh and cool.

¶ Easily and cheaply installed, the first cost is small.

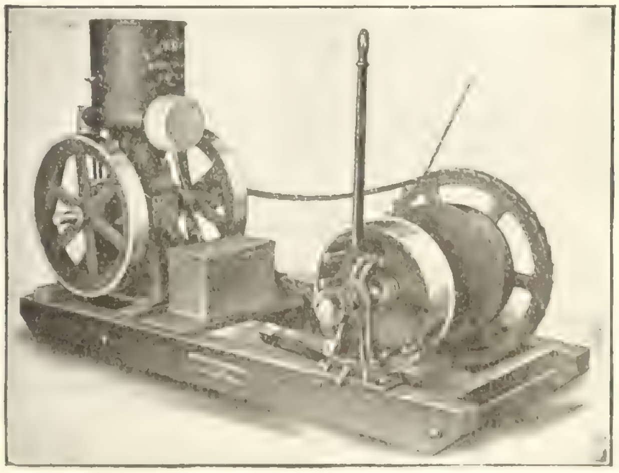
¶ The scientific design and construction of fan blades makes possible the moving of immense volumes of air at small expenditure of power.

¶ These fans are invaluable for use in workrooms, offices, kitchens, billiard halls, and in all places where heat, smoke or fumes are to be removed.

¶ Our engineering staff are always ready to make suggestions if you will inform us of the conditions to be met, the size of the room, etc

B. F. STURTEVANT COMPANY
HYDE PARK, MA.
Eady-Douglas, Limited **Polson Iron Works, Limited**
Montreal Toronto
850

DO YOU WANT A GOOD HOIST?



PATENT APPLIED FOR

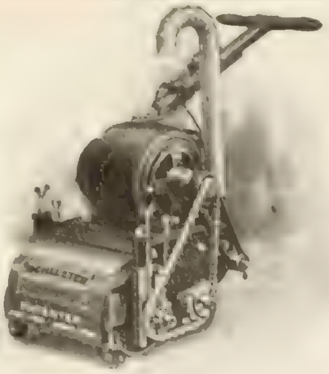
"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work **Mortar Conveying** **Well Digging**
Bridge Building **Sewer Building** **Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists London, Canada



Made in three sizes:
8 x 18, 8 x 15 and 8 x 12 in. Roller

Perfect Results Are Easily Obtained By Using Schlueter Rapid Floor Surfacer

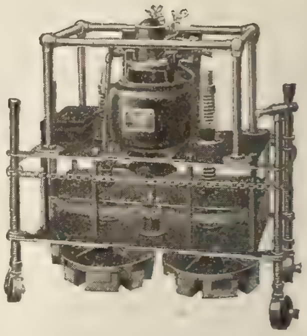
This machine is built on the only correct principle. It is guaranteed to be **The Best** machine with which to produce an even, smooth surface on any kind of large or small wood floor, old or new, hard or soft, and in all buildings: Residences, Stores, Factories, Bowling Alleys, Roller Skating Rinks, Reception and Dance Halls, Etc.

The **Schlueter** will remove all joints or warped edges, and oil, wax, lime stains, or the "muck" from skate wheels, in a most satisfactory manner.

(Earning capacity, $20.00 to $35.00 per day.)

Send for prices and **Free Trial Proposition.**

M. L. SCHLUETER, CHICAGO, ILL.
108 N. CANAL ST. N. Y. OFFICE, 1001 FLAT IRON BLDG.



Edge Roller easily adjusted to either side

The Des Moines Hemispherical Bottom Steel Tanks and Towers

have been used and approved by nearly all leading Engineers. They are undoubtedly the most economical means of storing water at an elevation.

We have built many of these in Canada the United States and Mexico. Estimates cheerfully furnished.

Send for Catalog No. 15

Des Moines Bridge & Iron Co.

Pittsburg, Pa., U.S.A., 945 Curry Bldg.
Des Moines, Iowa, U.S.A. 938 Tuttle St.

GLASS

Write our nearest office for quotations on any of your requirments for GLASS

The Hobbs Mfg; Co. Limited

Factories and Warehouses:
London Toronto Montreal Winnipeg

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A

Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

"Best Paving Block Made"

Quality is Economy
in Paving Brick

A STRONG TESTIMONIAL

Kalamazoo, Michigan, U. S. A.,
June 13, 1910.

"We used Metropolitan Block in 1895 and the best recommend I can give is that we have used many more of them nearly every year since."

(Signed) H. A. JOHNSTON,
City Engineer.

"Metropolitan Block" Make Permanent Pavements

The Metropolitan Paving Brick Co. - Canton, Ohio

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 1000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

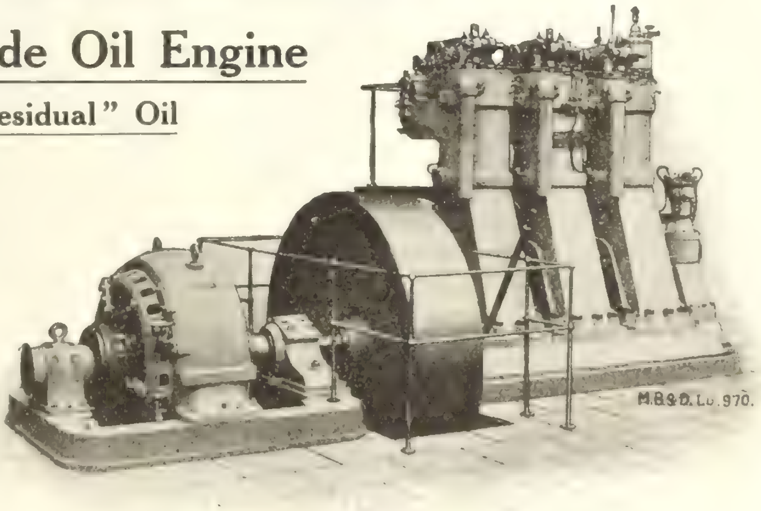
The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear
No Producer
No Chimney
No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdowns
Cheaper Buildings and Foundations
Unskilled Labour only
No Standby Losses

HIGH SPEED SLOW SPEED



35 to 1000 B. H. P.

Terra-Cotta Fireproofing

Get an Estimate from

ROBERT BENNETT
Contractor

Scarboro Junction, P. O.

☞ Over 25 years experience in U. S. and Canada

PHONE BEACH 4

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

THE COMMERCIAL

[illegible]

WINNIPEG

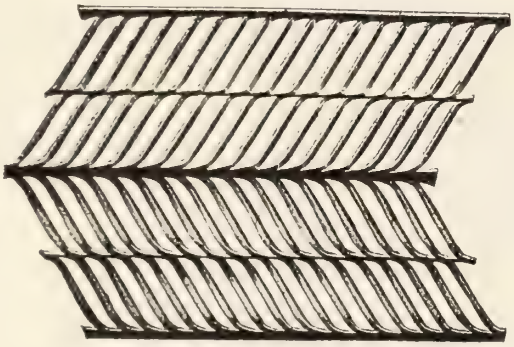
Note tremendous metal weight on this floor. Entire building of Alsen's Cement reinforced concrete

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Sherardized Herringbone Lath is the Best in the World



Every plasterer knows that the cause of corrosion in metal lath is gypsum in the plaster. Thomas Heyes & Sons, Toronto, Consulting Chemists, imbedded a piece of Sherardized Herringbone Lath in pure Plaster of Paris and tested it frequently for five months. They report that it showed absolutely no signs of deterioration. The price is also attractive;

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.
Metal Shingle & Siding Company, Manufacturers

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

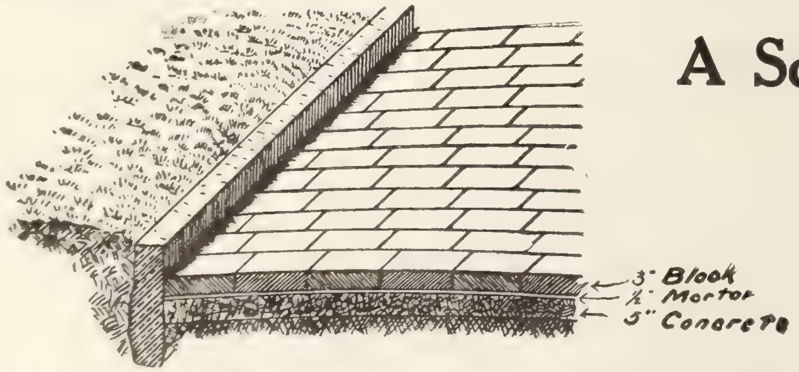
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Lap Welded Steel Pipe

MADE IN SIZES

12 to 72 inches Diameter

Used extensively for Water Supply for Mines, Mills, Hydraulic Operations and High Pressure Hydro Electric Installations.

Ask our Welded Pipe Dept. for prices.

American Spiral Pipe Works

MANUFACTURERS OF

SPIRAL RIVETED PIPE LAP WELDED PIPE
FORGED STEEL FLANGES

50 Church St. New York Box 485 Chicago, Ill.

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)

"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."

W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.

1032 Garfield Building, CLEVELAND, OHIO

SELLING AGENTS

The Dominion Equipment & Supply Co., Winnipeg, Canada

HOW ABOUT IT?

Just listen to the wonderful advantages of incorporating in your concrete.

Guelph Hydrated Lime

1.—The concrete works easier under the trowel
2.—It finishes easier.
3.—It improves the color of the finished work
4.—It makes the concrete more impervious to water
5.—It greatly improves the strength

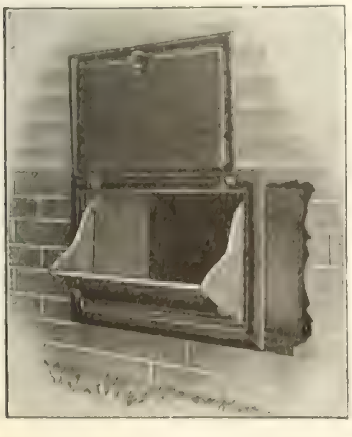
The above are not five fancy ideas but five established facts.

Specify **Guelph Hydrated Lime** when ordering from your dealer

---

Standard White Lime Co.

Guelph - Ontario



EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

Send for our illustrated [illegible]

The Down Draft Furnace Co., Limited

Galt, Ontario, Can.

Montreal Representative: E. F. Dartnell, No. 8 Beaver Hall Square.
Gorman, Clancey & Grindley, Agents, Calgary and Edmonton, Alberta.

The Smith Marble and Construction Co., Ltd.

Montreal

Office & Factory:
145 Van Horn Ave.

Show Rooms:
458 Bleury Street

Importers,

Manufacturers,

Contractors

OF

Interior and Exterior Marble, Slate, Floor and Wall Tiles, Mosaics, Plumers and Electrical Marble, Granites for Building and Monumental Work.

THE CEMENT ERA—A monthly trade journal of merit. Devoted to the concrete and cement industry. Is carefully edited in the interest of the trade. Covers the following subjects: Reinforced Concrete Building, Cement Block Manufacturing, Tile Making, Concrete Paving, Ornamental Cement Work, Waterproofing, Fireproofing, etc. $1.50 a year. Send for sample.

CEMENT PIPE AND TILE—By E. S. Hanson. A cloth bound book which fully treats the subject of manufacturing cement pipe and tile, its uses, cost of production, etc. Its author is recognized as the leading authority on this subject. Price $1.00 a copy, delivered.

DIRECTORY OF PORTLAND CEMENT MANUFACTURERS together with manufacturers of Gypsum and Lime. The only directory of its kind. Gives a full list of the companies, their officers, capacity of plants, capitalization, process of burning, etc. Price $1.00 a copy, delivered.

The Cement Era Publishing Co.

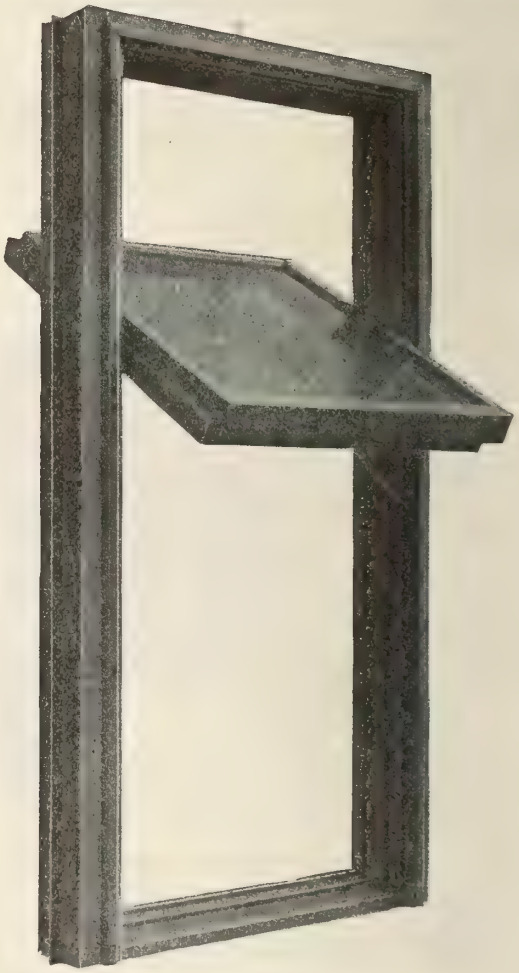
1200-1210 Morton Bldg. - CHICAGO, ILL.

Reasons why

you should specify

DOUGLAS BROS.

FIREPROOF WINDOWS



View of Double Hung Window

Easy to handle.
Mechanically perfect in construction.
Rigid and easily glazed.
Simply made and easily adjusted.
Made in a model factory by special machinery and skilled workmen.
And always delivered on time.
Other reasons will be found in our catalogue.

SEND FOR A COPY

Douglas Bros., Limited

Toronto, Ont. Montreal, Que.

IRON STAIRS

Dennis Wire & Iron Works Co.
London, Canada Limited

Toronto Offices - 12 QUEEN STREET E.

Information you MUST have. Which is the best the probable, approximate and perhaps, or the actual, definite, precise data about the proposed operation? MacLEAN DAILY REPORTS will give you the latter.

If we knew the exact nature of your business, the extent of your sales territory, the specific data required—we would tell you, clearly and concisely, how we can serve YOU, how we will do it, what it will cost.

MacLEAN DAILY REPORTS LIMITED
220 King Street West :: :: TORONTO

THE QUESTION—

"What is the Best Roller for our Kind of Roadwork?"

is conclusively answered by the

WATEROUS Double Cylinder STEAM ROLLER

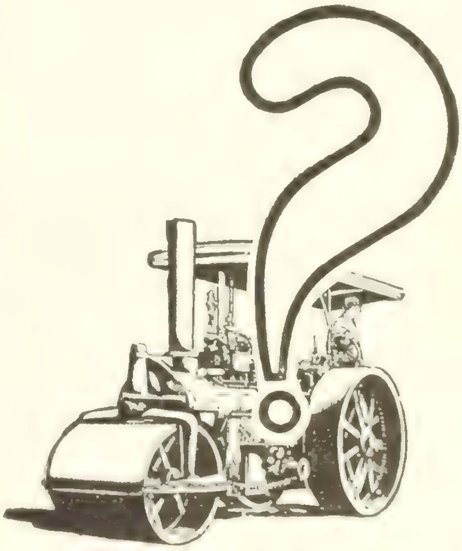
Over 100 Waterous Rollers are operating in Canada to-day. This means one at least in every province in the Dominion. Each one operating under entirely different conditions—on a different kind of road, using different material, in charge of men of widely different engineering ability. **And each one is making good.**

HERE'S WHY:—

The Waterous Roller carries a double-cylinder double crank engine, has cranks set on the quarter, which means full power at every part of the stroke,—*no dead centres.* *The Boiler* is of the locomotive type, a quick steady steamer—tested to 165 lbs. steam pressure. Provided with dumping grates and ash pan. Roller has a *two speed drive* for fast and slow work under full steam pressure.

All gearing *cut* from the *solid steel.*

Every part accessible and entirely controlled from the engineer's platform.

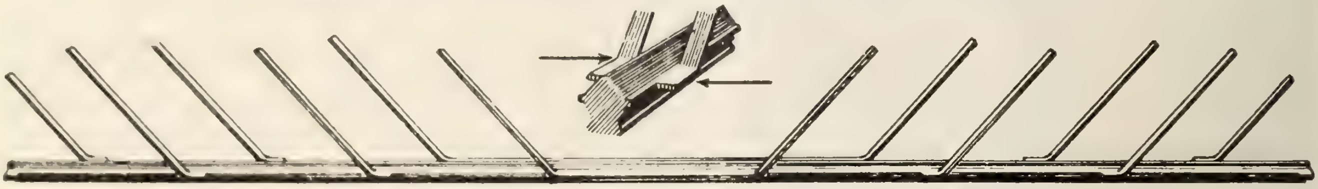


When you see a Waterous Roller at work ask the man who's in charge what he thinks of the machine—in the meantime write for our twenty page illustrated Booklet No. 301.

The
Waterous Engine Works Co.
Limited
Brantford, Canada

KAHN SYSTEM

OF REINFORCED CONCRETE



Note Rigid Connection of Shear Members

HY-RIB---

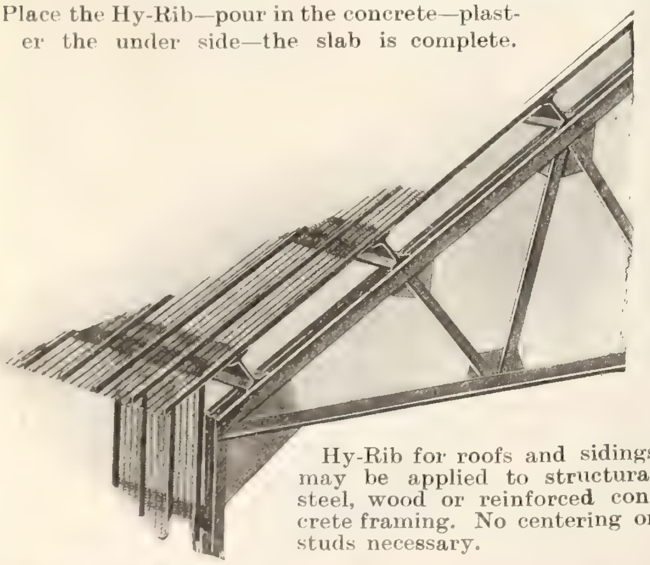
A Steel lath with deep stiffening ribs made from the same Sheet of Steel.

Furnished in three weights of metal, Nos. 2, 3 and 4 Ribs 13-16 inches high and 3½ inches center to center. Sheets 10⅓ inches wide center to center of outside ribs. Standard Lengths—6 ft., 8 ft., 10 ft., and 12 ft.

FLOORS AND ROOFS

Hy-Rib serves as reinforcement and centering for concrete floors and roofs, doing away entirely with falsework.

Place the Hy-Rib—pour in the concrete—plaster the under side—the slab is complete.

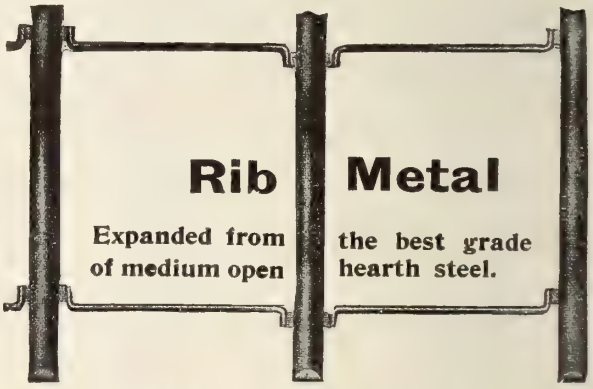


Hy-Rib for roofs and sidings may be applied to structural steel, wood or reinforced concrete framing. No centering or studs necessary.

Flood Your Building
with Light by Using

United Steel Sash

It is fireproof, permanent, strong, rigid. You can increase the light and thereby increase the efficiency of your staff.



RIB METAL

A Steel Mesh Reinforcement for Concrete Floors Roofs, Walls, etc.

Made in Sheets up to 18 feet in length, out of the one piece of material.

Greater effectiveness than any other similar material.

Easy to handle.

Other KAHN SYSTEM Products are Kahn Truss Bars, Rib Bars, Column Hooping and Trus-Con. Chemical Products.

TRUSSED CONCRETE STEEL COMPANY OF CANADA

LIMITED

Head Office and Works, Sales and Engineering Office:

WALKERVILLE, ONT.

Branch Offices:—

Union Bank Building, Winnipeg: 23 Jordan Street, Toronto: Corner St. James and Dalhousie, Quebec; 52 Hutchinson Building, Vancouver; 28 Bedford Road, Halifax; 128 Coristine Building, Montreal

KAHN SYSTEM Reinforced Concrete

KAHN SYSTEM Reinforced Concrete

Steel Bridges

and Concrete Work

For over a quarter of a century we have been building Steel Highway Bridges throughout Canada.

Our experience is at your disposal.

We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

Get our figures before closing your contracts.

The Hunter Bridge & Boiler Co., Ltd.

Kincardine, - Ontario.

Cut shows a Brown Hoist Locomotive Crane at work on the New York-Catskill Aqueduct. This crane is doing the excavating; placing the forms; handling the concrete in tubs; and covering up, besides the other miscellaneous work. *Catalogues are sent on request.*

The Brown Hoisting Machinery Co.

Main Office and Works, **CLEVELAND, OHIO.**

MODERN CONTRACTORS' PLANT

THOROUGHLY REPAIRED IMMEDIATE SHIPMENT

STEAM SHOVELS	2-70 ton Bucyrus, Nos. 816 & 922; 3 Marions, 1 Model 60, No. 1312, 1 Model 50, No. 1752 and 1 Model 20, No. 760; 4 Vulcans, 1-2yd. No. 605, 1-3yd. No. 720, 1-2½ yd. No. 932 and 1-3yd. No. 1327. All of these are in first class condition and each has a supply of extra parts.
LOCOMOTIVES	1-18″ x 26″ cylinder Mogul, Standard Gauge, and 18-10″ x 14″ Vulcan and Davenport dinkeys, 36″ Gauge. All recently repaired and in excellent condition.
CARS	160-3 yd. and 4 yd. Western Wheeled Scraper Co's. Two-Way Dump Cars, 36″ Gauge. 10 - 60,000 lb. capacity Flat Cars. 1 year old. All in good repair.
DRILLS	1 5-5/8″ Keystone Drill and Boiler; 2 Cyclone Drills.
HOISTS & DERRICKS	2—Mundy and 3—Lidgerwood Hoisting Engines complete with boilers, swing drums 50 derricks, blocks and lines to operate same.
ROCK CRUSHERS	2—Rock Crushers.
CONCRETE MIXERS	3—Smith and 1—Ransom 21 cu. ft. Concrete Mixers. The Ransom has a Boiler.
WAGONS	8—Dump Wagons, 7—Carts and 1—Road Waggon.
SCRAPERS	—Drag-Scrapers an 4—Wheel Scrapers.
MISCELLANEOUS	3—Plows, 6—Drop Bottom Concrete Buckets, 2—Stuvner Concrete Buckets, Switches, Switch Stands, 24-56 lb. Frogs, 48-36″ Switch Points, Stationary Boilers, Wheel-barrows, Forges, Blacksmith Tools, Jacks, Gauges, Small Tools, etc. Too numerous to mention.

ALL FIRST CLASS. IT WILL PAY YOU TO INSPECT IT BEFORE BUYING NEW

May be seen in our Shop Yards at Montreal, Canada

MONTREAL LOCOMOTIVE WORKS LIMITED

St. James St. and Dollard Lane - - MONTREAL, CANADA

Everything in Lumber for the Contractor

Fir, Hemlock, Spruce, Pine and Oak Timber and Lumber

We specialize in

Southern Pine Timber and Piles

10,000 Green Tamarac Piles for Immediate Shipment. Get our Prices.

THE ELMITT LUMBER CO. LIMITED, OTTAWA, ONT.

SCANDINAVIA
FEDERAL ENGINEERING & SUPPLIES LIMITED
TORONTO
BELTING

for Conveying Materials
Conditions may be WET or DRY

Federal Engineering & Supplies
Limited

Head Office, 284 Yonge Street, TORONTO
329 St. James Street, MONTREAL

THE
Thames Quarry Co.
St. Mary's, Ont.

CRUSHED STONE
Rubble, Coursing and Dressed Stone
Lime Stone for Flux

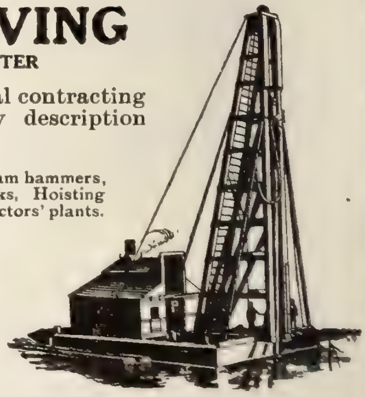
JOHN BONIS, Manager
Office Phone 110a Res. Phone 110b
Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING
LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT
Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.
Office: 64 Niagara St.
St. Catharines, - Ont.



The
Missisquoi Marble Company
Limited

Canada's Pioneer and Leading Concern in the Marble Business

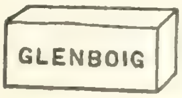
They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd. - -	Toronto, Ont.
C. N. Barclay - -	Winnipeg Man.
Bosse & Banks - -	Quebec, Que.
General Contractors Supply Company, Ltd. -	Halifax, N. S.
129 Sparks Street - -	Ottawa, Ont.
James Robertson Co. Ltd. -	St. John, N. B.
G. R. Duncan - -	Fort William, Ont.
Walker & Barnes - -	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd. -	Vancouver, B. C.
315 Coristine Building -	Montreal, Que.

Perfect Castings

can be obtained only when a practically perfect Fire-Brick is used.



Every
Glenboig Brick
bears the brand

GLENBOIG

represents the highest degree of perfection in a fire-brick yet produced. To quote a famous english engineer. "Every improvement you make in the quality of your fire-bricks makes possible another advance in the practical science of metallurgy."

Our literature will interest.

MAKER'S SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another.

Tide Water Iron Works
HOBOKEN, N.J. U.S.A.

Come to Us If You Need

Hardwood Flooring
Interior Trim
Veneer Doors
Pine Doors
Stairs Frames
Sash, etc.

We manufacture the above from Select Stock : :

J. R. Eaton & Sons
Limited
Orillia, Ontario

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 664 665   Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C. P. R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDER'S GAZETTE
VANCOUVER
Builders' Supplies
HYDRATED LIME
JOHN GUNN & SONS
Contractors' Machinery
FOR SALE
H. W. PETRIE, Limited
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

**Reinforced
Concrete
Construction**

¶ Our arrangement with C. P. R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES
Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches.......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES

(Installed in Toronto).

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite. 55 cents per square foot.

Viterous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 4 compression bath cock ....net $1.65

No. 4½ Fuller's ....net 2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30 gallon, standard, $4.50; extra heavy, $7.00

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

PAINTS AND OILS

(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, 8cc per gallon.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Brown sills and heads, in the rough, delivered, 40 cents per foot.

Rubble stone in car lots, $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds. delivered f.o.b. Toronto.

Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.

Lime, per cwt., delivered, 38 cents.

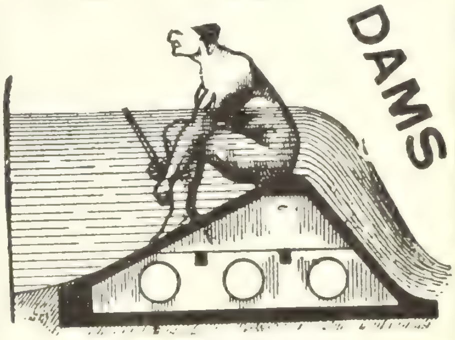
Plaster of Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

AUTOMATIC SASH HOLDER
saves cord, weights, pulleys, and materials- no pockets--easier to install for old and new windows. Send for sample and catalog to day. Agents wanted. Sold by the hardware trade or direct from 277 Broadway, New York.
Automatic Sash Holder Company

The
Laurentian Granite Co.
Limited
MANUFACTURERS OF
Building Granite, Granite Setts, Curbing, Etc.
Samples Furnished and Prices Quoted on Application
Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.
Bank of Ottawa Bld'g.
224 St. James St.
Montreal
Bell Tel. M. 4354

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS
General Manager.
Head Office:
INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc.,
Always in Stock
OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON
WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge
Company, Limited
WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway
Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge
and
Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
——Bridge and Construction Dep't.——
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS and CONTRACTORS

Water Washed Sand
Crushed Granite
Crushed Lime Stone

Prompt Attention Given Orders

Our Dock
Spadina Ave.
PHONES
Office - Adel. 1947
Yard - Adel. 1948

SAND & SUPPLIES, LIMITED
TORONTO

The
Phœnix Bridge & Iron Works Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

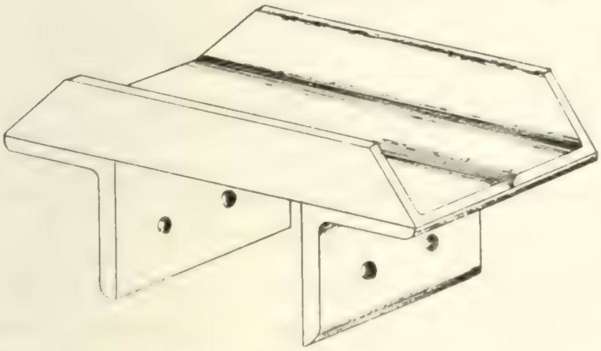
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

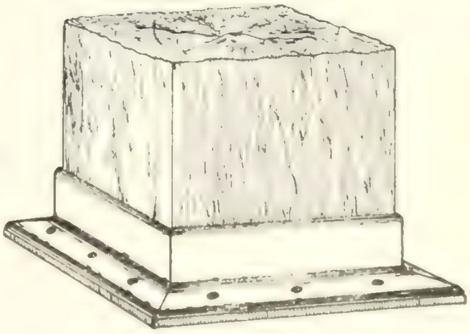
Wm. McNally & Co. - Montreal

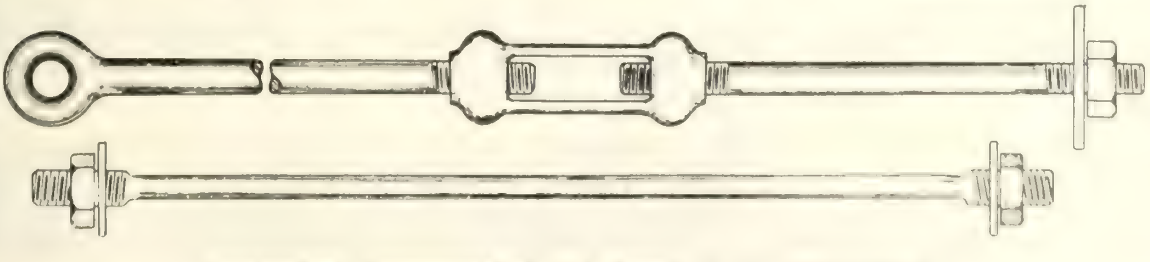
The Hamilton Bridge Works Company Limited

Hamilton, Canada



STEEL POST CAPS
and BASES
for Wooden Posts,
any size.
Also made in
Cast Iron





EYEBOLTS, TURNBUCKLES and RODS of all descriptions

Beams, Angles, Channels, Plates, any size from 1½ inch to 24 inches, and any length up to 70 feet

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President. J. G. Allan Vice-President. James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.

LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited

Sole Manufacturers under Canadian and U. S. Letters Patent

Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridge's Bay, TORONTO

When you think of Metal Ceilings think of GALT

A Contractor needs our Metal Ceilings—Because they can be erected

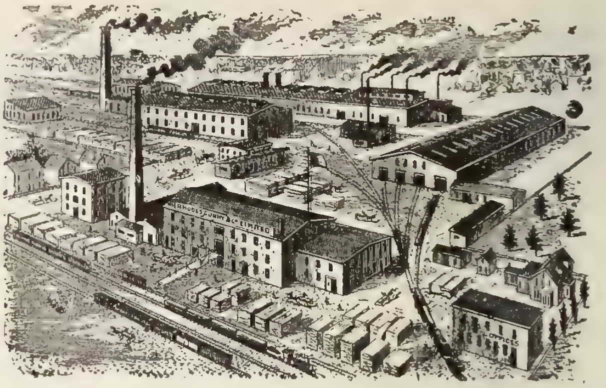
By
At
In
ANY
Carpenter
Time of the Year
Kind of Weather

Plans, Instructions, Wood Bracket and Nails Furnished Free.

Get Catalogue A-3

THE GALT ART METAL CO., LIMITED
GALT, ONTARIO

Rhodes, Curry Co., Limited
Lessees



Bank and Office Fittings
SCHOOL DESKS A SPECIALTY

We manufacture all kinds of building materials, including cast iron columns, cresting, sash weights, etc.

In addition to our large stock of native lumber, we are now carrying about one million feet of foreign lumber, including oak, walnut, ebony, whitewood, basswood, red cedar, Douglas fir, mahogany, &c.

Rhodes, Curry Co., Ltd. Amherst, N. S.
BRANCHES AT
Halifax Sydney

Chain Belt Mixer

WHEN you study the construction of the Chain Belt Mixer you just naturally wonder how we can make such a good mixer and sell it at a competitive price.

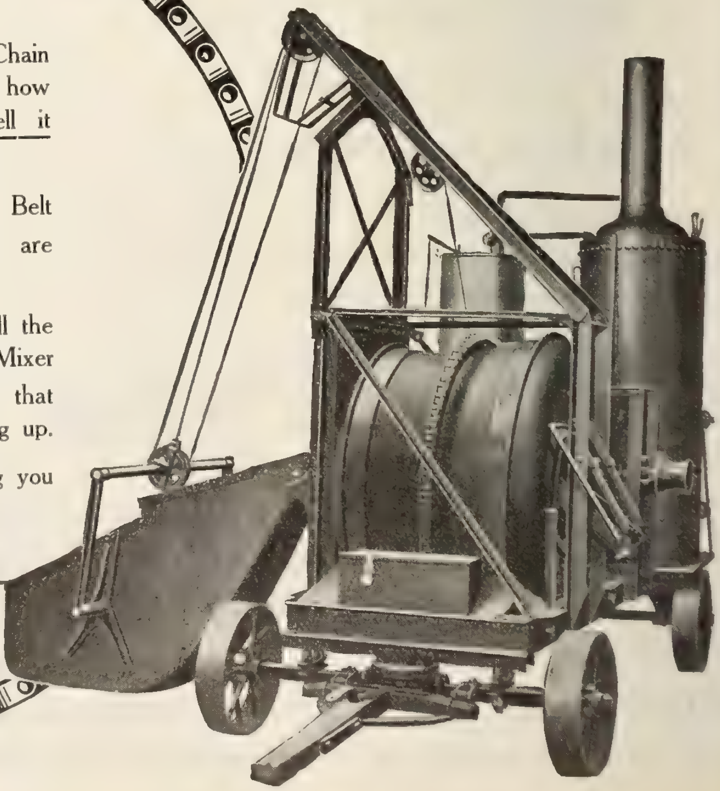
You get more real value in the Chain Belt Mixer because our manufacturing facilities are unequalled in the mixer field.

Every Casting—all the Steel Work—all the Machine Work—in fact every part of the Mixer is made in our factory by an organization that we have been a third of a century in building up.

A line to our nearest agent will bring you catalog and complete information.

Chain Belt Company
Established 1882
Milwaukee, Wis., U.S.A.

CANADIAN REPRESENTATIVES
Mixers in Stock for Immediate Delivery
MONTREAL—Canada Machinery Agency.
WINNIPEG—Dominion Equip. & Sup. Co.
VANCOUVER—Robt. Hamilton & Co.



THIS SPACE HAS BEEN RESERVED BY

NATIONAL BRIDGE CO.

OF CANADA, LIMITED

J. N. GREENSHIELDS, PRESIDENT.
H. W. BEAUCLERK, TREASURER.

WM. LYALL, VICE-PRESIDENT.
J. L. BROWER, C.E., GEN. MGR.

Works and Head Office - - - MONTREAL, Que.

Do You Think

that you can Afford

to pass us by before getting our prices on your requirements or before putting in your tenders on

Plate Sheet Fancy

or any kind of

Glazing Glass

The

Consolidated Plate Glass Co.

of Canada, Limited

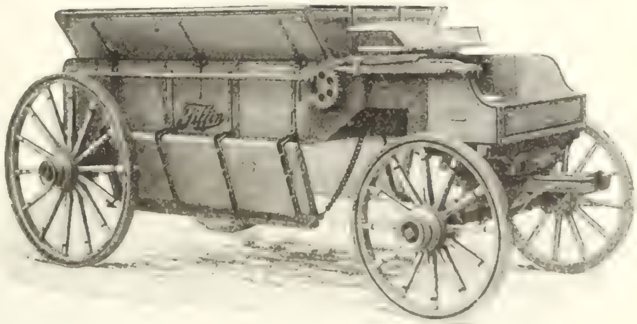
TORONTO MONTREAL WINNIPEG

Tiffin Dump Wagons

Flushing Machines, Sprinklers

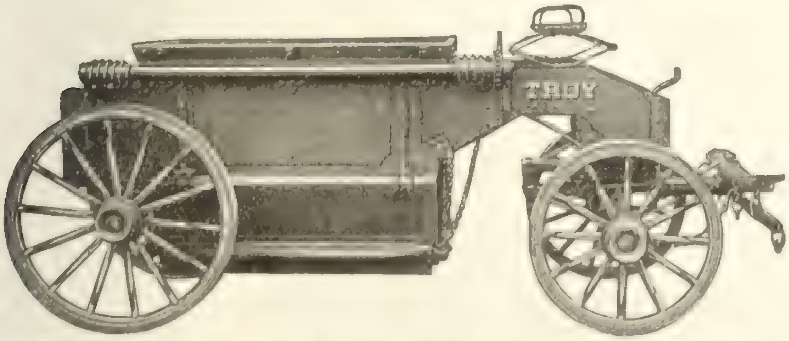
and Municipal Vehicles

are the best builded devices in the United States



The Tiffin Wagon Co.

TIFFIN, OHIO



Think of Your Horses

These Hot Days

Weight, 1890 lbs. Height, 4 ft. 8½ in. Wheel Base, 8 ft. 4 in.

With the mercury at 110, it's a crime to make your horses pull any surplus weight and it's mighty poor business. The TROY SPECIAL is a hot weather wagon. Note the weight. See how its coupled. Light enough for any team in any weather. Strong enough for any material on any job. You'll want the wagon when you knew the price. Get catalogue, 2 Z

The Troy Wagon Works Co., North Market Street, Troy, Ohio

PURE WATER

It is easy to obtain with our plants and apparatus

We design and contract for complete municipal filtration plants of any capacity.

We supply and install apparatus for sterilizing water supplies by the application of calcium hypochlorite.

Literature, Sketches, Estimates and Recommendations Supplied on Request

American Water Softener Co.

1001 Chestnut St., PHILADELPHIA, Pa.

We have no affiliations or working acquirements with any of our competitors.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

Celebrated

Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.

Toronto Agent
A. P. STEWARD - Builders' Exchange

THE MILTON PRESSED BRICK Co. LIMITED

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

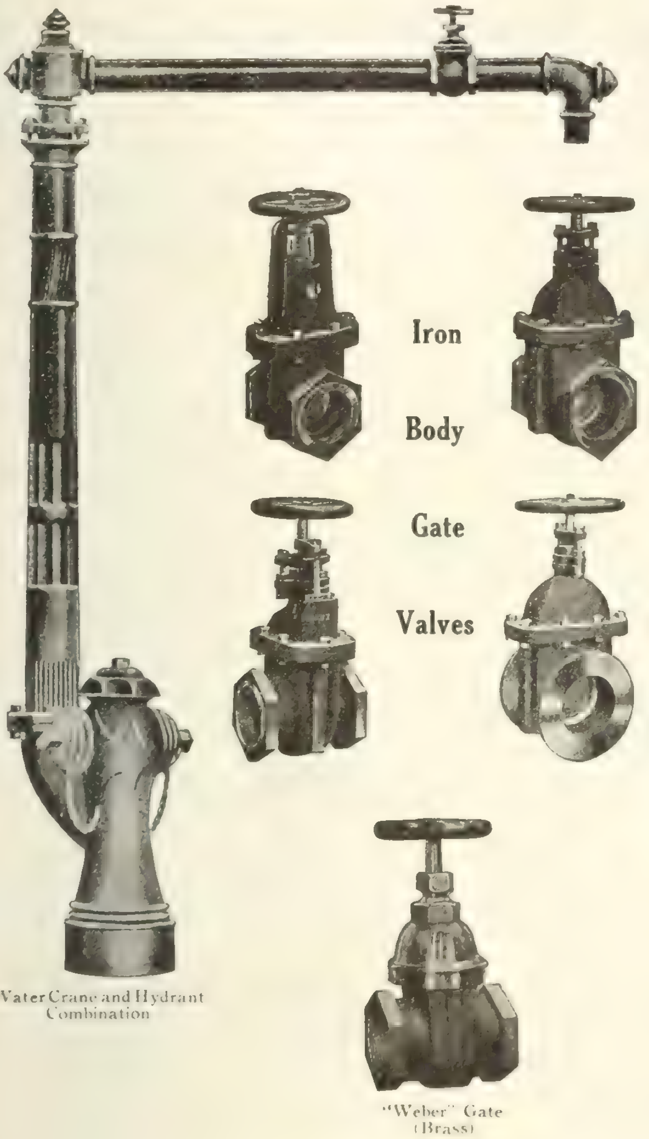
We are Agents for the Fiske Tapestry Brick, suitable for high-class residential work. At our Toronto Office we have set up panels of the different color schemes and would be pleased to have you call and examine them.

Head Office: Milton, Ont. **Toronto Office: Janes Building**

EADIE-DOUGLAS LIMITED, Ottawa Agents
Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

We Make KERR Valves and Hydrants

for every branch of waterworks construction



Water Crane and Hydrant Combination

Iron Body Gate Valves

"Weber" Gate (Brass)

Indicator Post for Fire Protection Valve

Every part of every "Kerr" valve is accurately made and finished, making them reliable under all conditions

A system of waterworks is not a proposition that a city or town has to undertake very often and it is a big saving to have the first installation done properly by specifying the best of materials. "Kerr" goods have a reputation for being reliable and lasting.

Shall we send you a catalogue?

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power
Civil Engineers
TORONTO WINNIPEG
Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN
CONSULTING ENGINEERS
STEAM, ELECTRIC AND HYDRAULIC POWER
43 KING ST. WEST - TORONTO

T. Harry Mace
ENGINEER
Hydraulic, Steam, Electric, Railway,
Municipal, Reinforced Concrete
630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.
Bowman & Connor
Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae
CONSULTING ENGINEER
Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON
ENGINEERS
Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.
405 Dorchester Street East, MONTREAL

John. T. Farmer
MECHANICAL AND
HYDRAULIC ENGINEER
427 Coristine Bldg., Montreal

EDW. O. FUCE
Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor
CIVIL ENGINEER
GALT - ONTARIO
Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell
Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.
A. M. Can. Soc. C. E. A. M. Am. Soc. C. E.
Consulting Civil and Municipal Engineer
SPECIALTIES
Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.
315 Pacfic Building, Vancouver B.C.

JAMES C. KENNEDY
Mem. Can. Soc. C.E.
Civil and Hydraulic Engineer
Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.
Suite 413, Pacific Block, Vancouver, B. C.

JOSEPH N. ROULEAU
Submarine Diver
Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.
793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.
Consulting, Civil and Sanitary Engineers
General Municipal Engineering
Specialties: { Waterworks, Sewerage and Electric Lighting.
Winnipeg and Calgary
John Haddin E. L. Miles

Jas. A. McIlwraith
General Contractor
For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.
COLLINGWOOD, ONT.

Allan Keefer
Architect
Ottawa, Ontario

Arthur L. Weeks
Architect
Canada Life Building, Ottawa
Reinforced concrete and steel structures. factories and commercial buildings

TRADE MARK TAMCO
FOR SALE
"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

ROBERT W. HUNT, President
JAS. W. MOFFAT, Secretary
THOS. C. IRVING JR., Vice-Pres.
CHAS. WARNOCK, Treas. & Man.

Robert W. Hunt & Co.
Limited
Bureau of Inspection,
Tests and Consultation

Head Office and Laboratories,
CANADIAN EXPRESS BLDG., MONTREAL, QUE.
Branch Offices,
TRADERS BANK BUILDING, TORONTO ONT.
Norfolk House, LAURENCE POUNTNEY HILL, LONDON. E.C.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.
Locomotives and Cars
JOHN J. GARTSHORE
58 Front Street W., TORONTO

Bonds of Suretyship
for Officers and Employees in positions of trust.
Bonds Bid and Supply
in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies.
The Guarrantee Company of North America
The Pioneer Company. *Established 1872*
Head Office - Montreal
Capital and Resources over - $2,000,000
Claims Paid over - - - $2 300,000
NO CLAIMS IN DISPUTE
This Company is not a party to any premium tariff combination.

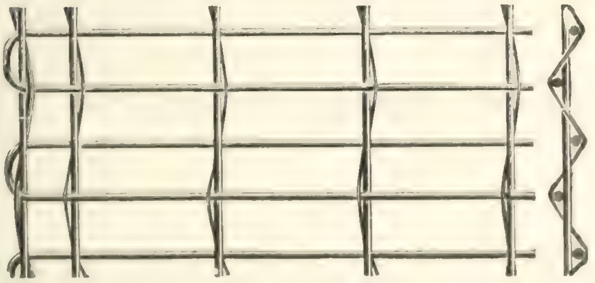
"Old Sol." Harnessed
BY
Luxfer Prisms

By a careful and scientific study of the requirements of store and warehouse lighting and by years of experience the "LUXFER PRISM" products have attained the highest degree of perfection.

With this system daylight is handled as though it were a stream of water and is delivered to dark basements and improperly lighted warehouses and stores.

Luxfer Prism Company,
100 King Street West - - Toronto

WIRE LATHING



Consider the advantages of Greening's Wire Lathing. It is fire proof, rat proof, shrink proof, warp proof. The key is perfect. The plaster cannot become detatched from the lath as it clenches through mesh forming a double coat of plaster. Greening's Wire Lathing is particularly adapted for use in stores, factories and warehouses where the vibration of machinery or the moving of heavy weights is liable to shake the plaster off ordinary wood lathing.

Every Builder and Architect should have our Lath and Wire Reinforcing Catalog.

WRITE FOR CATALOG NO. 6

The B. Greening Wire Company, Limited
HAMILTON, ONT. - MONTREAL, QUE.

INDUSTRIAL - CONTRACTORS - EQUIPMENT

Lifting gate End Dump Car

We make these any guage, any size, style and number.

We make chutes of all kinds. For chuting concrete—coal—sand—anything.

Write for our Catalog No. 31-A

We make a specialty of Heavy Sheet Steel work.

Gable bottom car; all sizes

High Quality
Low Prices
Quick Shipments

SACKETT - CHICAGO

1691 Elston Ave., Chicago, Ill.

We are in the Cement Concrete

Culvert and Sewer Pipe

Business

Have Been Building

Concrete Pipes

For Twenty Years.

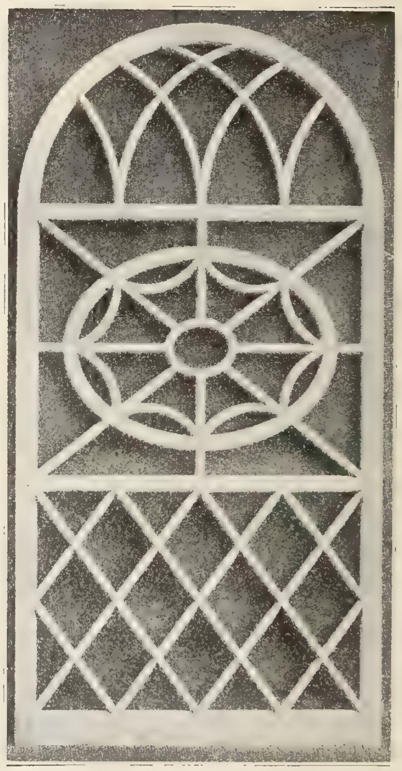
Our quality is the highest. Our prices the lowest. Sizes 6 to 45 inches (REINFORCED.)

Railways and Corporations are amongst our satisfied customers.

Write us your wants—we do the rest.

Ebenezer North Co.

LONDON, ONTARIO

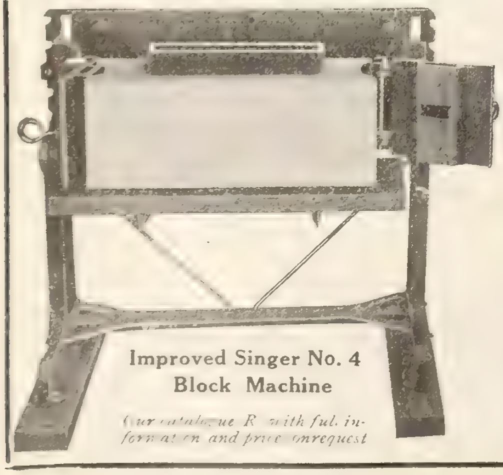


Diamond Sash

particularly suited for Gothic and Queen Ann style windows. It is impossible to successfully manufacture these sash without the proper machinery, but we have it. Every light is uniform, the joints are perfect and all the lines are absolutely straight where they should be and uniformly curved in the curved parts;

M. Brennen & Sons Mfg. Co., Ltd.

HAMILTON, ONTARIO



Improved Singer No. 4 Block Machine

Our catalogue R with full information and price on request

It Makes

Face Down Blocks

Blocks 4″, 6″, 8″, 10″ 12″, 16″ and 20″ long. 4″, 6″, 8″, 10″ and 12″ wide.

All Blocks on One-size Pallet.

Sold in combination to suit purchaser at reasonable prices. Guaranteed against defect ve material or poor workmanship.

Vining Mfg. Co.

Niagara Falls, Ont.

Vault Doors and Safes

J. & J. Taylor

Toronto Safe Works

Established 1855 **TORONTO**

Branches: Vancouver and Winnipeg
Montreal

Canada Wire & Cable Co., Ltd.

Announce the Opening of their New

Wire, Cable, and Wire Rope Works

at Toronto

The Product of our Electrical Wire Department will include

Electrical Wires and Cables

in Aluminum and Copper

BARE AND INSULATED—FOR ALL PURPOSES.
GALVANIZED IRON TELEGRAPH AND TELEPHONE WIRE

The Product of our Wire Rope Department will include:

Standard Hoisting Ropes
Semi-Pliable, Pliable and Extra Pliable Ropes
Improved Patented Crucible Cast Steel Hoisting Ropes
Improved Mild Steel (Siemens-Martin) Elevator Ropes
Transmission and Colliery Ropes
Tiller Ropes
Galvanized Steel Hausers
Galvanized Strand 2, 3 and 7 wire for Guys
Ropes to any Standard Specification

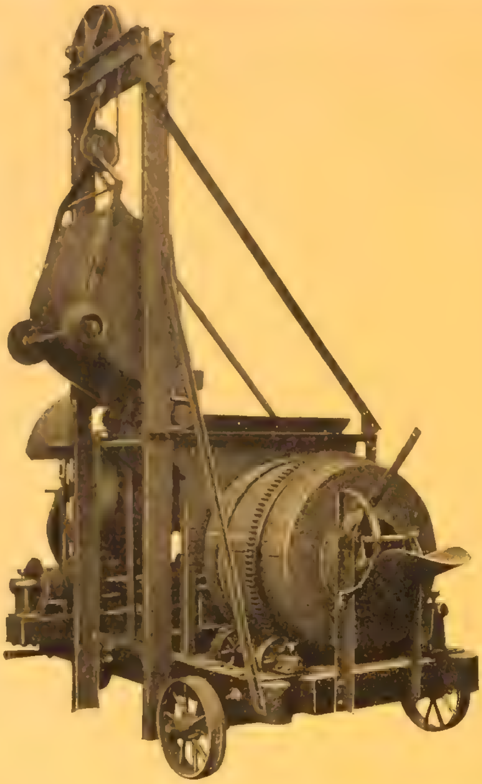
Literature ready for distribution at an early date. Write for it

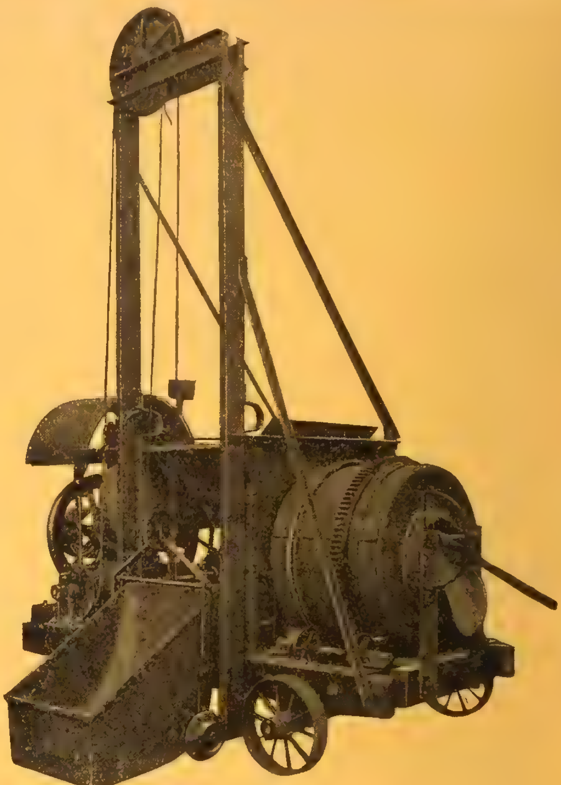
CANADA WIRE & CABLE CO.

LIMITED

Factory at
1160-70 Dundas Street
Toronto

HEAD OFFICE
KENT BUILDING, 156 YONGE STREET,
TORONTO





Ransome Street Concrete Mixer

If you require a concrete mixer of a large capacity and with a very low cost of output for mixing first quality concrete—we want you to investigate our RANSOME STREET CONCRETE MIXER. This machine was designed specially for street work and we can prove there is no better machine for the purpose. This outfit is not an experiment—it has been thoroughly tried out in actual service and found to be as nearly perfect as could be possible. Simple in operation—efficient and durable.

We have many street mixers in operation throughout Canada and we would like you to investigate our claims.

Supplied with Gasoline, Steam or Electric Power.

Can we send Catalogue?

F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.
GORMAN, CLANCEY & GRINDLEY, LTD., Calgary and Edmonton Agents

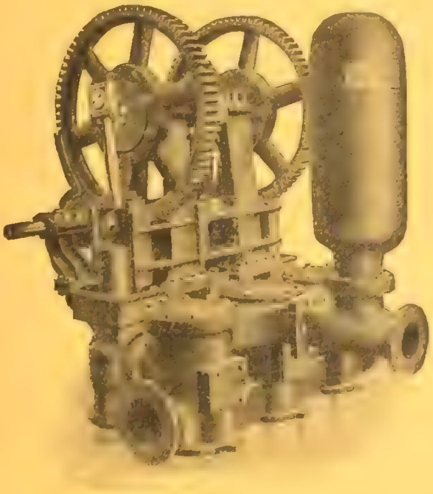
Vol. 25 Toronto, August 23, 1911 No. 34

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

We manufacture Steam and Power Pumps, Condensers, Travelling Cranes, Etc.



Write for Catalogue

The **Smart-Turner Machine Company** Limited
HAMILTON, ONTARIO

"MADE IN CANADA"

Bent Glass

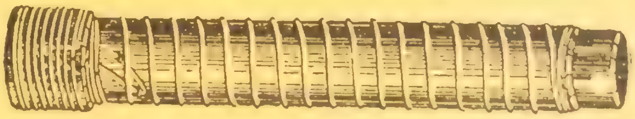
Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: 91 to 133 Don Roadway
TORONTO

High Speed
Portable
COMPRESSORS
Page 26

Canadian **RAND** Co., Ltd.
Commercial Union Bldg., Montreal, Can.



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS

for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe—and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

THIS "AMERICAN" BUILDING CONTRACTORS' ENGINE WITH TWO REVERSIBLE FRICTION DRUMS

will operate the Boom and Hoisting Lines of a Derrick, a Material Elevator, Circular Saw, Mixer, Pump, etc. All on one job, if necessary.

PAYS FOR ITSELF ON ONE GOOD JOB

"The **"AMERICAN" Builders' Engine** is one of the biggest Money Savers a Contractor can own.

W. H. WERNER,
Shreveport, La.

Write for Information and Prices

American Hoist & Derrick Co.

ST. PAUL, U. S. A.

Gorman, Clancey & Grindley	Edmonton and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot, Ltd.	Vancouver, B.C.
Stuart Machinery Co., Ltd.	Winnipeg, Man.

American Hoist & Derrick Co., St. Paul, Minn.
Please send us Prices and Information
on "AMERICAN" Builders Engines
....
....
....
8-23-11

More and more frequently Canada Cement is being named in specifications because Builders and Architects keep these facts in mind

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

CANADA CEMENT COMPANY LIMITED MONTREAL
PORTLAND
CANADA
CEMENT

Canada Cement Company, Ltd.

MONTREAL - TORONTO - WINNIPEG - CALGARY

TRUCKS

We carry a large and varied stock to fill your immediate wants

Also a complete line of

Wheelbarrows Scrapers Ploughs
Picks Shovels Crowbars
Wire Rope and Fittings
Jacks Blocks Pumps Etc.

We can give immediate shipments

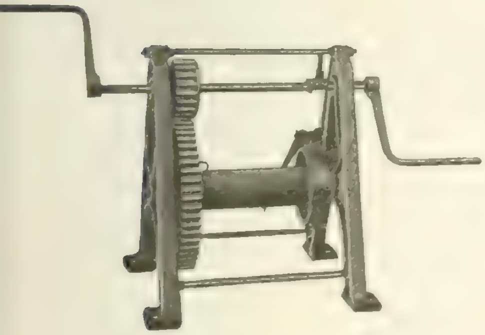
Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

Reading Multiple Gear Chain Blocks

The one man block

All sizes from ¼ ton to 20 tons in stock



Single and Double Purchase

CRAB WINCHES

Various Sizes

you need something in a hurry---try us---you'll find we generally have it.

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Asbestos Goods [illegible]

	Page
Asbestos Mfg. Co	27

Architects

Keefer, Allan	92
Weeks, Arthur I	92

Architectural Iron Work

Canada Wire Goods Mfg. Co.	82
Dennis Wire & Iron Works	77
Meadows Co., Geo. B	33

Air Compressors

Escher Wyss & Co	29

Asphalt Plant

East Iron Machine Co.	73

Buckets

American Hoist & Derrick Co.	2
Sackett Screen & Shute Co.	

Belting

Federal Engineering & Supplies, Ltd	80

Brick Chimneys

Heinicke, H. R	32

Blowers

Sturtevant Co., B. F.	

Boilers

Inglis, John	65
Jenckes Machine Co.	2
Leonard & Sons, E	73
Marsh & Henthorn	71
McDougall Caledonian Iron Works	67
Mussens Limited	4
Waterous Engine Works Co.	77

Brick Machinery and Supplies

Berg Mfg. Co.	
Wert C. S.	10
Whitehead, John	

Brick

American Enamelled Brick Co.	
Don Valley Brick Works	7
Hamilton Pressed Brick Co.	17
Milton Pressed Brick Co	90
Port Credit Pressed Brick Co.	86
Toronto Pressed Brick Co.	

Brickmaker's Supplies

Sackett Screen & Shute Co.	

Bridges (Steel)

Attica Bridge Co.	70
Canadian Bridge Co.	84
Cleveland Bridge Co.	84
Des Moines Bridge and Iron Co.	32
Dickson Bridge Works	
Dominion Bridge Co.	84
Hunter Bridge and Boiler Works	79
National Bridge Co.	69
Phoenix Bridge and Iron Works	85
Pennsylvania Steel Co.	84
Sarnia Bridge Co	32

Cement

Alsen Portland Cement Co	74
Britnell & Co	80
Bremner, Alex	87
Canada Cement Co	3
McNally & Co., W.	85
Morrison & Co., T.A.	92
Rogers, Alfred Limited	9

Concrete Pipe

Dominion Concrete Co.	22
Lock Joint Pipe Co.	

Cement Waterproofing

Ceresit Waterproofing Co.	18
Chillas-Black	19
Hercules Waterproofing Cement Co	30
Mansbendel, F. P	76

Cranes, Travelling & Locomotive

	Page
American Hoist & Derrick Co.	2
Armstrong, H. J.	69
Brown Hoisting Machinery Co.	79
Males Co	62
Parker, S. E	20
Willis Shaw Machinery Co	62

Conduits

Conduits Co., Limited	87

Crushed Stone and Granite

Sand and Supplies	85
Smyth & Ryan	31

Concrete Mixers and Machinery

Canada Foundry Co.	20
Chain Belt Co	79
General Machinery Co.	33
Gould, Shapley & Muir	16
Hopkins & Co., F., H.	92
Ideal Concrete Machinery Co.	31
Jenckes Machine Co.	2
London Concrete Machinery Co.	33
Milwaukee Mixer Co.	16
Mussens Limited	4
Morrison & Co., T. A	88
Municipal Engineering & Contracting	73
Richert Mfg. Co.	25
Steel and Radiation (Cement Gun)	23
Standard Scale	
Vining Bros.	
Wettlaufer Bros.	
Wert C. S.	10

Contractors' Plant

American Hoist & Derrick Co.	2
Acme Eqpt. & Engineering Co.	75
Beatty & Sons, M.	6
Hepburn, John T.	12
H. & E. Lifting Jack Co	69
Hopkins & Co., F.H	92
International Marine Signal Co.	8
Willis Shaw Machinery Co.	62
Marsh & Henthorn	71
Montreal Locomotive Works	72
Mussens Limited	4
Parker, S. E	20
Richert Mfg. Co	25
Ritchie Contractors Supply Co.	78
Tiffin Wagon Co.	78
Troy Wagon Works	28
Watson Wagon Co	78
Wert C. S.	10

Crushers (Stone and Rock)

Berg Machinery Co	
Hopkins & Co., F. H.	92
Jenckes Machine Co	2
London Concrete Machinery Co.	33
Males Co	62
Mussens Limited	4
Morrison & Co., T. A	88
Willis Shaw Machinery Co.	62

Corrugated Iron

Galt Art Metal Co	
Metallic Roofing Co	71
Metal Shingle and Siding Co.	29
Ormsby, A. B., Limited	11
Roofers Supply Co	87

Contractors

Bennett, Robt.	89
Foundation Co	9
Holmes, Fred.	
McIlwraith, Jas. A.	83
Nadel & Adler	88
Wells & Gray	

Coal Handling Apparatus

American Hoist & Derrick Co.	2
Down Draft Furnace Co.	75
Parker, S. E	20

Derricks and Derrick Fittings

	Page
American Hoist & Derrick Co.	20
Parker, S. E	20

Drills

Beatty & Sons M	6
Canadian Rand Co	26

Drilling Contractors

Harvey, J	83

Dredges

Beatty & Sons, M	6
Males Co.	62
Willis Shaw Machinery Co	62

Dry Kilns

Sturtevant Co., B. F.	32

Electrical Apparatus, Motors

Canada Ford Co.	

Engines

Canadian Boving Co.	
Inglis, John	65
Jenckes Machine Co	2
Leonard & Sons, E	73
Mussens Limited	4
Sturtevant Co., B. F.	32
Waterous Engine Works Co	77

Engineers (Civil) and Mechanical

Barber & Young	88
Chipman & Power	88
Bowman & Connor	88
Farmer, John T	88
Fuce, Edw. O.	88
Galt Engineering Co., John	88
Hancock, H. Syd.	88
Inglis, John	65
Kennedy, Jas. C.	88
Lea & Ferguson	88
Mace, T. Harry	88
Mitchell, C. H.	88
McRae, John B.	88
Moore & Scollan	88
Taylor, James	88

Exhaust Heads

Sturtevant Co., B. F.	32

Filters

American Water Softener Co.	

Floor Surfacers

Schleuter, M. T.	

Friction Clutches

Berg Machinery Co	

Field Instruments

Consolidated Optical Co	
Gurley, W. & L. E.	67

Fire Brick

Gibb, Alexander	81

Fire Apparatus

Morrison & Co T. A.	88
Seagrave, W E.	80

Fireproof Doors and Windows

Douglas Bros	76
Mussens Limited	4
Ormsby, A. B.	11
Steel and Radiation	23

Granite and Marble

Laurentian Granite Co.	83
Missisquoi Marble Co.	81
Smith Marble & Construction Co.	

Glass

	Page
Consolidated Plate Glass Co.	
Hobbs, Mfg. Co.	
Luxfer Prism Co.	
Toronto Plate Glass Importing Co.	1-76

Hoists (Hand Gasoline and Electric

Parker, S. E.	20

Heating Apparatus

Jenckes Machine Co.	2
Leonard & Sons, E	73
Steel and Radiation	23

Hoisting Machinery

American Hoist & Derrick Co.	2
Beatty & Sons, M.	6
Canada Ford Co.	
Inglis, John	67
Jenckes Machine Co.	2
Hopkins & Co., F. H.	92
London Gas Power Co.	71
Marsh & Henthorn	71
Mussens Limited	4
Parker, S. E.	20
Sturtevant Co., B F.	32

High Pressure Pipe Lines

Escher Wyss & Co.	29

Hydrants

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co.	86
Kerr Engine Co.	
Smyth & Ryan	

Interior Finish and Doors

Anglin, S.	74
Brennen & Sons, M.	
Batts Limited	
Canada Office & School Furniture Co	
DeLaplante, Ltd.	81
Bryan Mfg. Co.	71
Eaton & Sons, J. R.	81
Elmitt Lumber Co.	80
Georgian Bay Shook Mills	68
Rhodes Curry & Co.	
Wilson Bros.	

Locomotives

Montreal Locomotive Works.	72

Metal Form for Concrete

Reichert Mfg. Co.	25

Lime

Christie, Henderson & Co.	82
Jamieson Lime Co.	30
Ontario Lime Association	
Standard White Lime Co	75

Metal Lath

Galt Art Metal	
Metallic Roofing Co.	71
Noble C. W.	74
Steel and Radiation	23

Meters

Hopkins & Co., F. H.	92
McDougall Caledonian Iron Works	67
Neptune Meter Co.	25

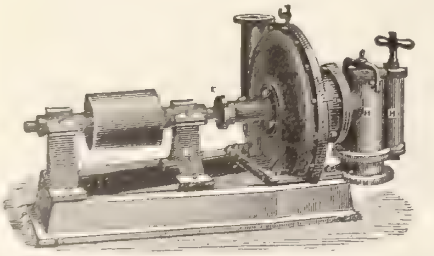
Paving and Paving Materials

Dominion Carbolineum Works	
Metropolitan Paving Brick Co.	
Ontario Asphalt Block Co.	74
Shawmut Paving Brick Co.	32
Silica Barytic Stone Co. of Ontario	83

(Continued on page 10)

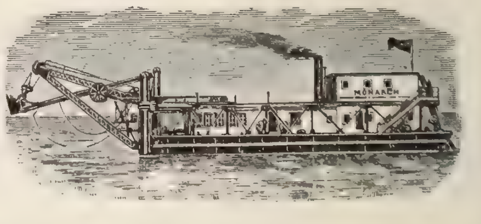
M. Beatty & Sons, Limited
Welland, Ontario, Canada

Dredges, Ditchers, Derricks, Steam Shovels



Steel Dump and Deck Scows

Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery.



Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Engineers and Builders

OF ALL

Steel and Iron Structures

Mill Buildings our Specialty. Roofs, Bridges, Columns and Girders of Every Description. Large Stock of Structural Shapes always on hand for immediate shipment. Ask for Designs and Estimates on your Work.

International Marine Signal Company Limited

OTTAWA, CANADA

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Page
Albert Mfg. Co	69
[illegible] & Co	82
Calkins, H W	80

Portable Saw

Canadian Fairbanks	22

Pipe

American Spiral Pipe Works	75
Canadian Pipe Co	80
Dominion Wood Pipe Co.	12
Dominion Concrete Co	22
Gartshore-Thomson Pipe Co.	86
Lock Joint Pipe Co.	
Manderlok & Co	11
National Iron Works	87
Pacific Coast Pipe Co.	1
Pedlar People	
Steel Co. of Canada	19
Steel and Radiation	23

Plumbers' Supplies

Standard Ideal Co.	34

Power Engines

Inglis Co., John	65

Paints and Varnishes

Paterson Mfg. Co.	90

Pile Driving Machinery

American Hoist & Derrick Co.	2
Lincoln Construction Co.	80

Pumps and Pumping Machinery

American Well Works	
Beatty & Sons, M	6
Cook, A. D	
Escher Wyss & Co.	29
Hopkins & Co., F. H.	92
Inglis Co , John	65
Leonard & Sons, E	73
McDougall Caledonian Iron Works	67
Mussens Limited	4
Ontario Wind Engine & Pump Co	32
Smart-Turner Machine Co.	1
Waterous Engine Works Co	77

Roofing Materials

	Page
Asbestos Mfg Co.	27
Galt Art Metal Co.	
Metallic Roofing Co.	71
Metal Shingle & Siding Co.	29
Noble, Clarence W	74
Paterson Mfg. Co.	90
Philip Carey Co	
Rooters Supply Co	87
Standard Paint Co.	

Railway Supplies

Gartshore, John J.	88
Hopkins & Co., F. H.	92
Mussens Limited	4

Reinforcements, Concrete and Steel

Ambursen Hydraulic Construct'n Co.	83
Canada Wire Goods Mtg. Co	82
Steel Co. of Canada	19
Steel & Radiation	23
Trussed Concrete Steel Co	81
Turner, C. A. P.	

Road Machinery

Hamilton Machinery Co.	15
Morrison & Co., T. A	88
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co	20
Hopkins & Co., F. H	92
Montreal Locomotive Works	72
Mussens Limited	4
Males Co	62
Willis Shaw Machinery Co	62

Shingles,—Asbestos

Asbestos Mfg. Co.	27

Stone

Anderson, Geo	18
Britnell & Co.	82
Brodie, Jas.	
Christie, Henderson & Co.	82
Consolidated Stone Co.	
Contractors' Supply Co	82
Corinthian Stone Co	24
Crushed Stone, Limited	73
Doolittle & Wilcox	87
Hagersville Contracting Co.	11
Laurentian Granite Co	83
McMillan & Son, R	77
Morrison & Co., T. A.	88

Stone

	Page
Myers, Oakley	73
Roman Stone Co	13
Sackville Freestone Co.	8
Sand & Supplies	85
Thames Quarry Co.	80

Sand and Gravel

Rogers Supply Co	31
Sand & Supplies	85
Smyth & Ryan	31
York Sand and Gravel Co.	31

Steam Apparatus

Sturtevant Co., B. F.	32

Submarine Diver

Rouleau, Joseph N.	88

Structural Iron and Steel

Dominion Bridge Co	84
Franklin Steel & Iron Co.	
Steel Co. of Canada	19
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	83
Salter, W. H.	85
Steel & Radiation	23
Sarnia Bridge Co	32

Sewer Pipe

Britnell & Co	82
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
GartshoreThomson Pipe Co.	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	17
National Iron Works	87
Ontario Sewer Pipe Co	21
Standard Drain Pipe Co.	21

Slate

Roofers Supply Co.	87

Steel Shingles and Ceilings

Galt Art Metal Co.	

Smoke Stacks

Leonard & Son, E.	73

Safes and Vaults

Taylor, J & J	

Tents

Woods Limited	25

Testing and Inspection Bureau

	Page
Hunt & Co., Robt. W	88

Tiles

Smith Marble & Construction Co.,	

Tanks and Stand Pipes

Berg Machinery Co	
Inglis, John	65
Jenckes Machine Co	2
Leonard & Sons, E.	73
Marsh & Henthorn	71
McDougall Caledonian Iron Works	67
Ontario Wind Engine & Pump Co.	32

Trade Journals

Castellanos A. W.	32

Valves

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co	86
Kerr Engine Co.	

Ventilating and Heating Apparatus

Sturtevant Co., B. F.	32

Water Softeners and Filters

Berg Machinery Co.	
American Water Softener	

Wire Rope

Canada Wire and Cable Co.	91
Greening Wire Co., B.	
Smith, Thos. & Wm.	14
Steel Co. of Canada	19

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	82
Crescent Wire Iron Works	83
Greening Wire Co B.	
Sackett Screen & Shute Co	
Steel and Radiation	23

Water Wheels

McDougall Caledonian Iron Works.	67
Canadian Boving Co.	

Water Turbines

Esche Wyss & Co	29

Wires and Cables

Canada Wire and Cable Co.	91

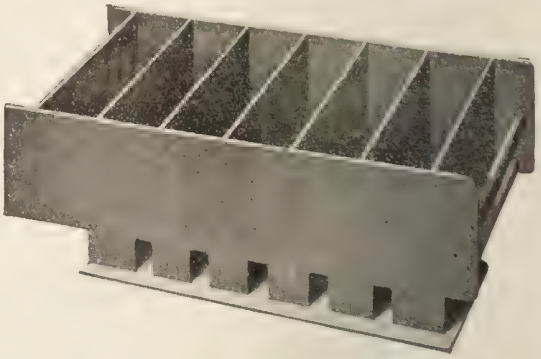
Wheelbarrows

Sackett Screen & Shute Co.	
Parker, S. E	20

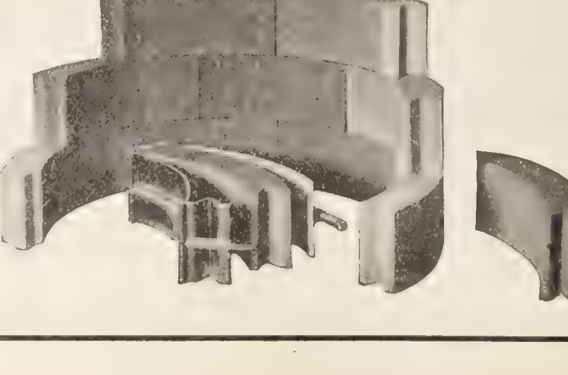
THE POPULAR AND SUPERIOR
PERFECT BRICK MACHINE
AND MY VARIOUS MOULDS ARE USED IN ALL PARTS OF THE WORLD
Patented in Canada

C. S. WERT
Inventor and Manufacturer of
The Perfect Brick Machine and Moulds
602 North Main St.,
Kendallville, Ind., U. S. A.
Write for Catalogue and Prices
Agents and Distributers wanted in Canada.

THE POPULAR AND SUPERIOR
PERFECT BRICK MOLD
IS USED IN ALL PARTS OF THE WORLD



The Perfect Well, Cistern and Silo Molds



PRICE LIST
No. 3 Circle Mold. The diameter of its circumference, 3 feet. No. 5 Circle Mold. The diameter of its circumference, 5 feet No. 7 Circle Mold. The diameter of its circumference, 7 feet. All sizes up to 7 foot retail at $12.00 each All other sizes retail at $15.00 each.
The Circle Moulds vary in length from 22 to 28 inches, depending on the diameter of its circumference.
In ordering Circle Molds always give the diameter of what you are going to build and I will then understand the kind of Circle Mold you desire
No. 10 ircle Mold is 10 ft. diam.
No. 12 " " " 12 " "
No. 14 " " " 14 " "
No. 16 " " " 16 " "
Price $15.00 each

MODERN.

→ ESTABLISHED 1861. ←

MUNDERLOH & CO. LD.

Sole Agents in Canada for

MANNESMANN SEAMLESS STEEL PIPES

FOR GAS & WATER MAINS

AN IMPROVEMENT ON CAST IRON MAINS.

51 VICTORIA SQUARE.

MONTREAL.

MADE UP TO 40 FEET IN LENGTH.

STRONGER. CHEAPER. RELIABLE.

THE

Proved Quality Dump Car

The unequaled **practical** experience back of Western Dump Cars combined with their **sturdy** construction and the fact that they have always led in improvement is the reason for their matchless reputation for **quality** and **efficiency**—they are as good as greatest skill can make them.

The Western Four Yard Car

is ideal size for 3-ft. gauge. It is unbeatable in design and construction—ample capacity for heavy loads, yet of low, compact form, with bed and truck separable, steep dumping angle and automatic pivoted side boards. It is dependable in **any** service.

Sizes and styles of Dump Cars for every purpose are described in our general catalog of earth and stone-handling machinery.

Western Wheeled Scraper Co.

AURORA, ILL.

ANY DESIGN CARRIED OUT

We give you any design you may detail in our **Kalameined Clad Doors.** We also have a large number of stock designs that make a superior door. For **architectural effect** and **real fire protection** it would be very difficult to get anything in the door line that could surpass our **machine made Kalameined Clad Doors.** Specify our door for real satisfaction. We can give you real copper covered doors, coppered doors, german-silver covered doors or any covering you desire.

A. B. Ormsby, Limited

Experts in Fireproof Windows and Doors

Factories: - - Toronto and Winnipeg

"HAGERSVILLE"

CRUSHED STONE

FOR

CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

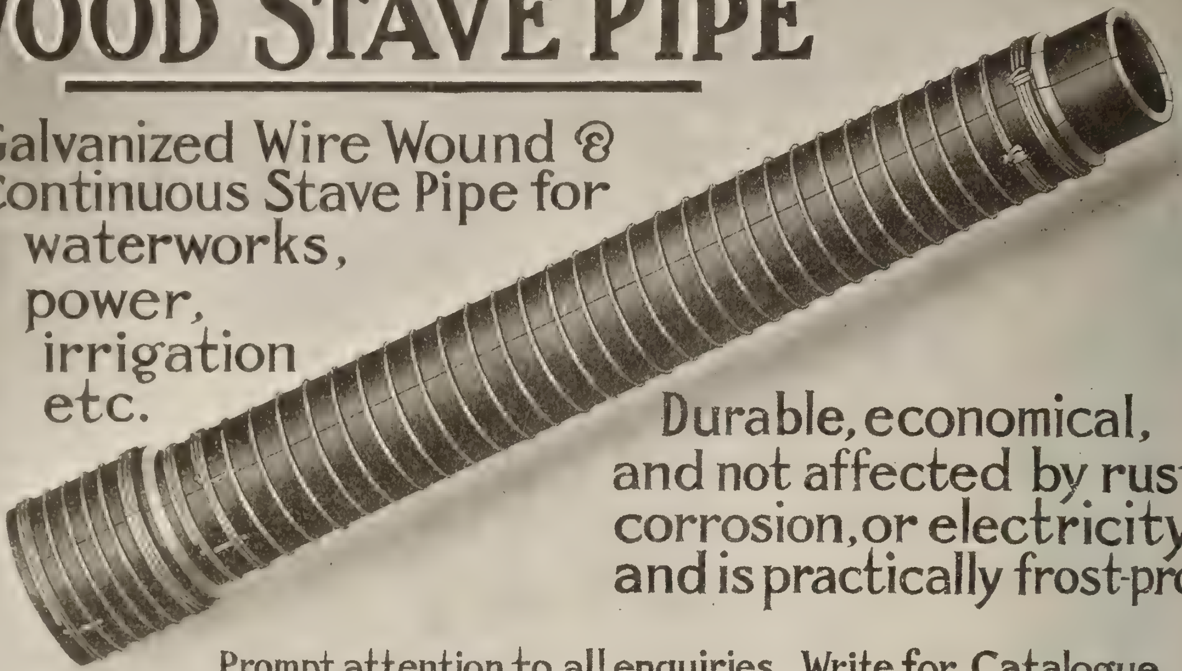
SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R.
and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Better Order that Derrick To-Day

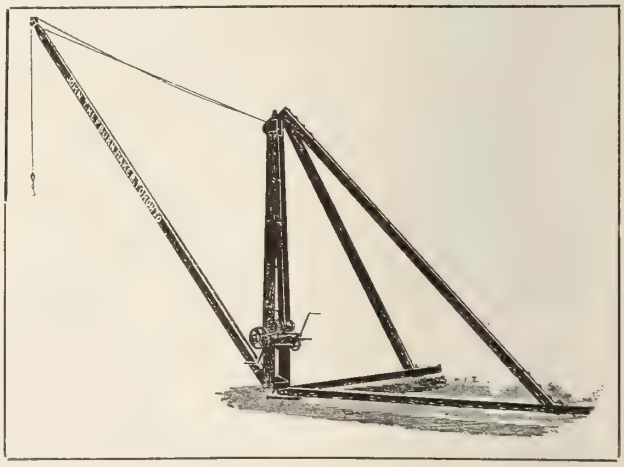
You have contracts on hand. Labour is scarce. And every day that passes means one day nearer the end of the season.

What are you going to do?

John T. Hepburn

Scotch Derricks

will do a lot of hard work in a little time. They are designed to do it, and built to do it—designed and built for the man who can see the spot-cash value of time saving and labour saving equipment. A HEPBURN DERRICK shows a labour saving over the old-Style derrick of fully 50 per cent. Can you afford to do without one.

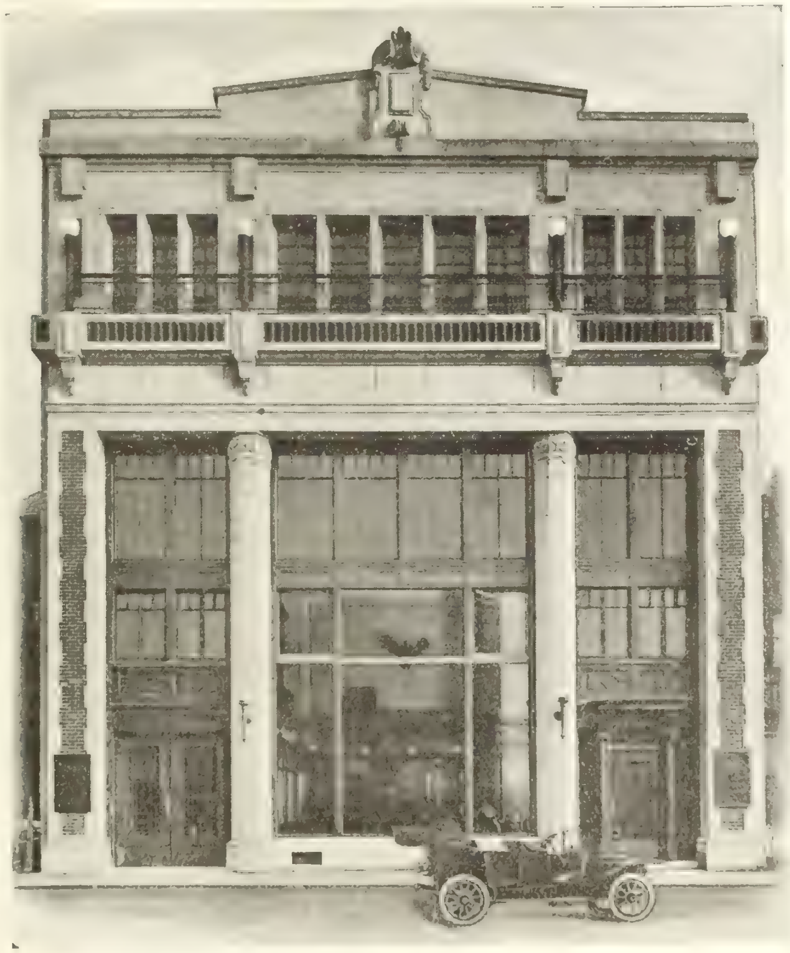


Don't wait till to-morrow. Write to-day for full particulars. One day now is worth two days later on.

JOHN T. HEPBURN, 18-40 Van Horne Street, Toronto, Canada

Roman Stone

(Trade Mark Registered)



Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company

Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

THOS. & WM. SMITH, LD.,
WIRE ROPE MANUFACTURERS,
NEWCASTLE-ON-TYNE, ENGLAND.

ELECTRIC CABLEWAY OVER THE ZAMBESI RIVER AT THE VICTORIA FALLS.
Span, 870 feet. Working Load, 10 tons. Main Cable 8¼" circ. Breaking Stress of Main Cable, 275 tons.
Main Cable supplied by THOS. & WM. SMITH LTD., Newcastle-on-Tyne.

HIGH-CLASS WIRE ROPES
For CONTRACTORS' WORK, such as BLONDINS, CRANES, INCLINES, BALLAST ROPES, &c., &c., and all classes of work requiring Wire Ropes.

AGENTS IN CANADA:
Evans, Coleman & Evans, Ltd., Vancouver. Angel Engineering & Supply Co. Ltd., St. John's, N.F.
Baines and Peckover, Toronto.

REPRESENTATIVE FOR CANADA:
D. W. CLARK, P.O. Box 521 TORONTO, ONTARIO.

USE ONLY SMITH'S "RED THREAD" WIRE ROPES.

"CHAMPION"

Road and Contractors' Machinery

makes contracting a business, not a gamble

There is no element of uncertainty as to just what you can look for from "CHAMPION" Machinery. It does its work and stands up to it—no expensive break-downs—no costly loss of time—no frequent tinkering—only the ordinary wear and that at a minimum.

In these days of competition, profit margins are not so large that anyone wants to run the risk of unexpected delays and expense. And yet everybody knows that unreliable machinery can easily sap away all the profit.

"CHAMPION" Road Machinery has exclusive features possessed by no others.

"CHAMPION" Road Machinery is made of the highest grade materials in the finest factory in the country devoted to this line.

The famous "CHAMPION" Rock Crushers with their double motion jaw, "CHAMPION" Elevator and Graders and various other machines have made this reliable line

"Standard in Canada for 20 Years"

Write for our catalogs telling us in which machine you are interested.

SPECIAL: Send all orders for repair parts direct to the Hamilton Machinery Co. and save 3 to 5 days.

American Road Machine Company, of Canada, Limited

GODERICH, ONT.

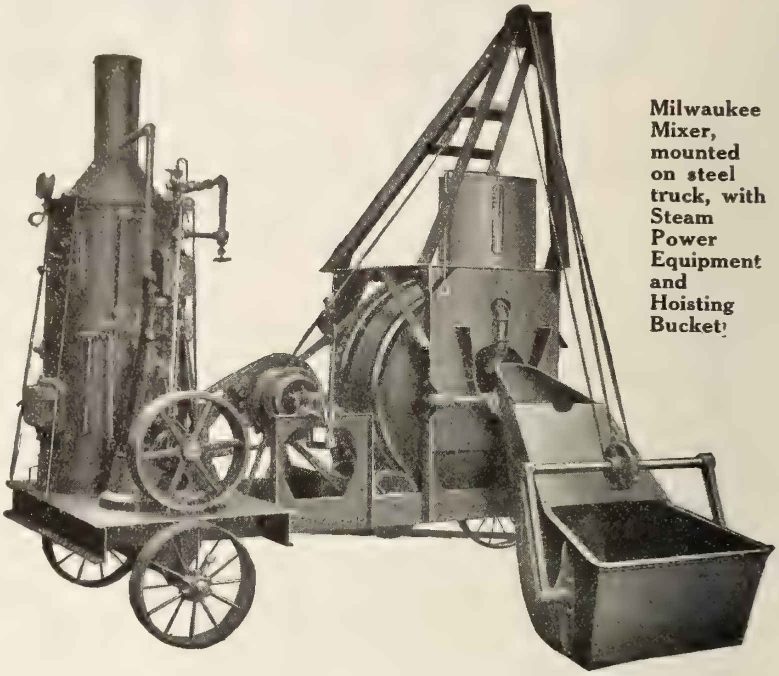
Address all Correspondence to

THE HAMILTON MACHINERY CO., LIMITED, HAMILTON, ONT.

(Sole Selling Agents)

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

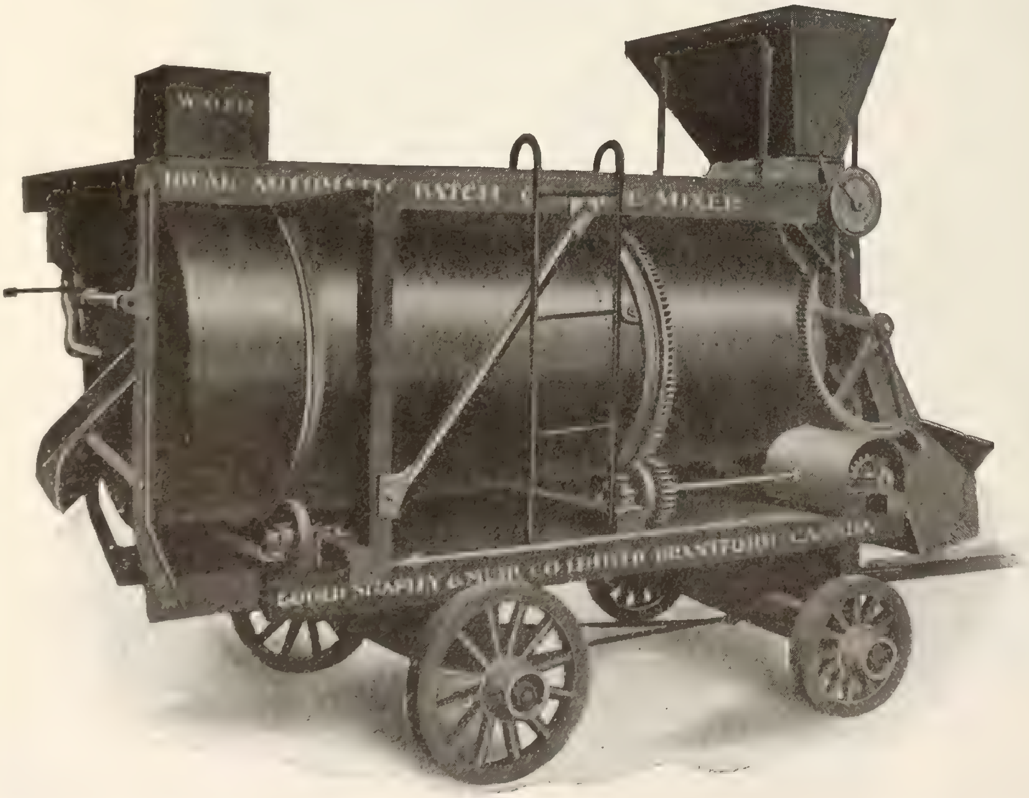
MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES.

The Stuart Machinery Co., Winnipeg, Man. **C. W. Stancliffe & Co., Vancouver, B. C.**
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS



Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

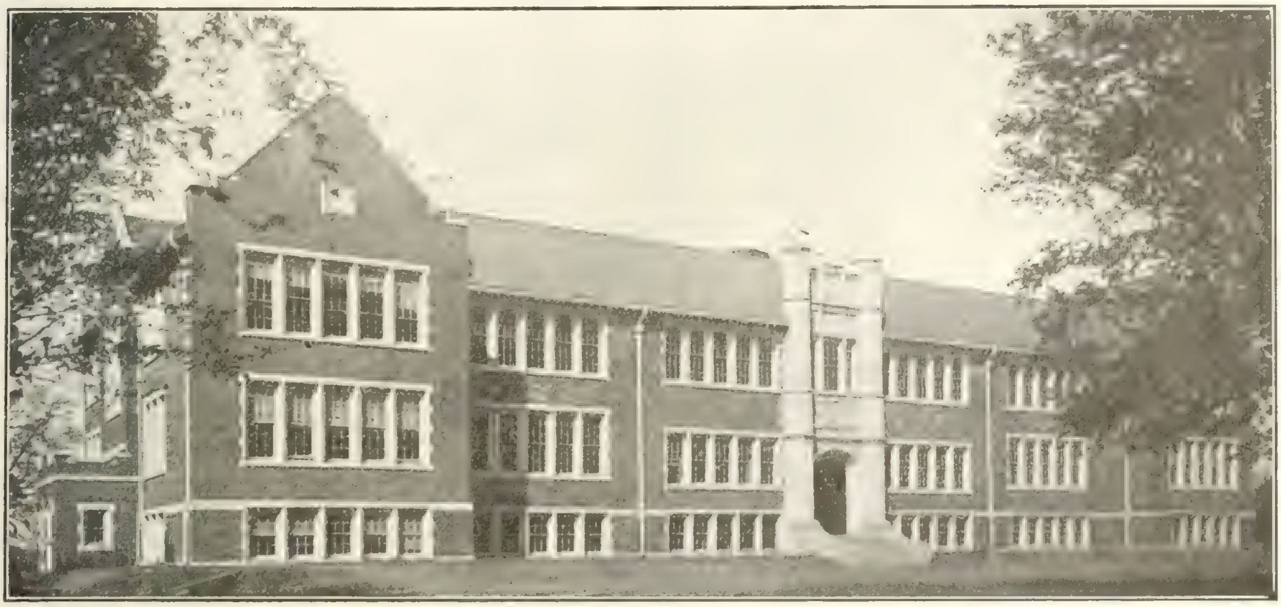
Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY
& MUIR CO. LTD.
Brantford, Canada

Hamilton Pressed Brick



New Collegiate Institute, Brantford, Ont. Chapman & McGiffen, Architects, Toronto

For Clean Brick-Work

This brick is free from so-called soda. After twenty years it will look as clean and fresh as the day it is delivered. Hamilton Pressed Bricks are uniform in size and color. The illustration shows a neat, clean cut job obtained with our brick. Specify **more** than "Brick" make it **"Hamilton Pressed Brick."**

Besides furnishing a high class product we can fill your orders promptly. Connections with T. H. & B., C. P. R., G. T. R., M. C. R

Hamilton Pressed Brick Company

Limited

Phones
Factory 1992
Office 2931
Residence 345

Spectator Building, Hamilton, Ont.

Toronto Representative, WALTER HUNTER, 105 MACDONELL AVE. Telephone Park 3170
Montreal, STINSON-REEB CO., Eastern Townships Bank Building.

Circular Diamond Saws

For Limestone, Marble and Sandstone

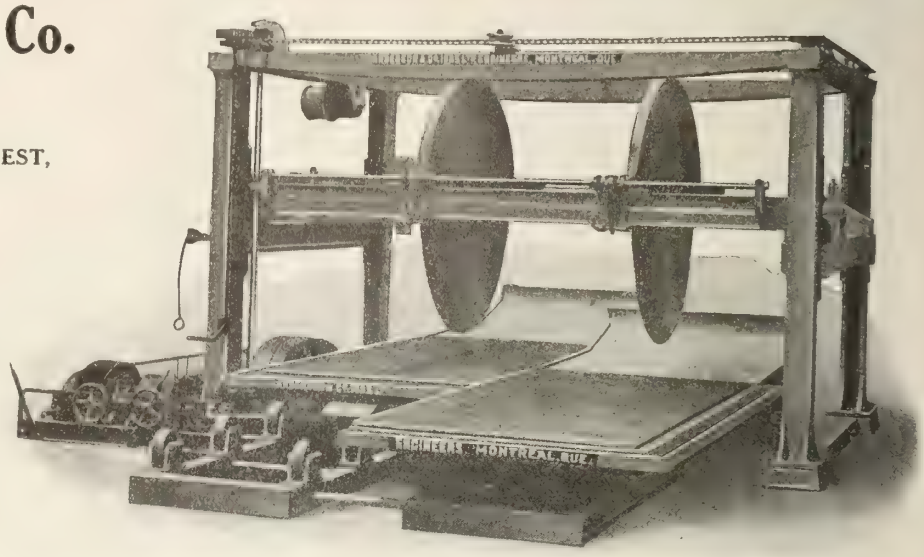
Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICES & WORKS

London, England, 82 Victoria St., S.W.
Newark, N.J., U.S.A. 420-422 Ogden St
Montreal Works, 157 Craig St. West
Head Works, Carnoustie, Scotland

MAKERS OF

Gangs, Planers, Marble Dressers, Derricks, and Electric Traveling Cranes up to 50 tons, Quarry Machinery, Gas Engines and Producer Plants.
10 H. P. to 150 H. P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 SINGLE AND DOUBLE TABLES

About 50 of the above Machines at work in Canada

A Reliable Waterproofing

For Cement and Concrete

Unlike all others for foundations, cellars, cellar floors, tunnels, dams, reservoirs, swimming pools, building walls, bridges, etc.

What is Ceresit ?

Ceresit is the name of a dependable waterproofing.

Ceresit is a cream white paste which is added to, and is generally dissolved in the water used in mixing cement mortar and concrete.

By mixing in the water the Ceresit permeates the entire mass uniformly. This is impossible with powdered waterproofing.

Italian Pool in the Gardens of Doubleday, Page & Co., Publishers of "Country Life," at Garden City, Long Island, waterproofed with Ceresit

Ceresit for Concrete

Ceresit is incorporated in the concrete mass and thus becomes a part of it, permanently rendering the mass proof against the penetration of water even under great water pressure besides protecting it from frost.

Please write for our Book "S" on "Waterproofing" for Cement and Concrete. Ceresit is catalogued on pages 46 and 47 of Sweet's Index.

Ceresit for Cement Mortar

Ceresit can be mixed with the water used in cement mortar coating to waterproof or dampproof structures built of any material such as brick, stone, concrete stucco, plaster and tile.

Ceresit is Guaranteed

Ceresit is guaranteed to be an unfailing, permanent waterproofing when the work is done under our direction.

Ceresit Waterproofing Company, Chicago
General Offices Commercial Bank Bldg.
Branches: 1133 Broadway, New York 1218 Chestnut St., Philadelphia

PLEASE CUT OUT THIS
REMINDER
to write for BOOK "S" on
WATERPROOFING
to Ceresit Waterproofing Co., Commercial Bank Bldg., Chicago.

USE

"TOCKOLITH"

(TOCH BROTHERS)

IT PERMANENTLY PROTECTS IRON AND STEEL AGAINST ALL RUST AND CORROSION

IT COMBINES WITH INITIAL RUST AND PREVENTS FURTHER ACTION

SEND FOR CIRCULARS AND INFORMATION

INVALUABLE FOR

STRUCTURAL IRON STEEL SMOKE STACKS
STEEL GIRDERS STEEL BRIDGES

CANADIAN OFFICE AND FACTORY

THE R. I. W. DAMP RESISTING PAINT CO.

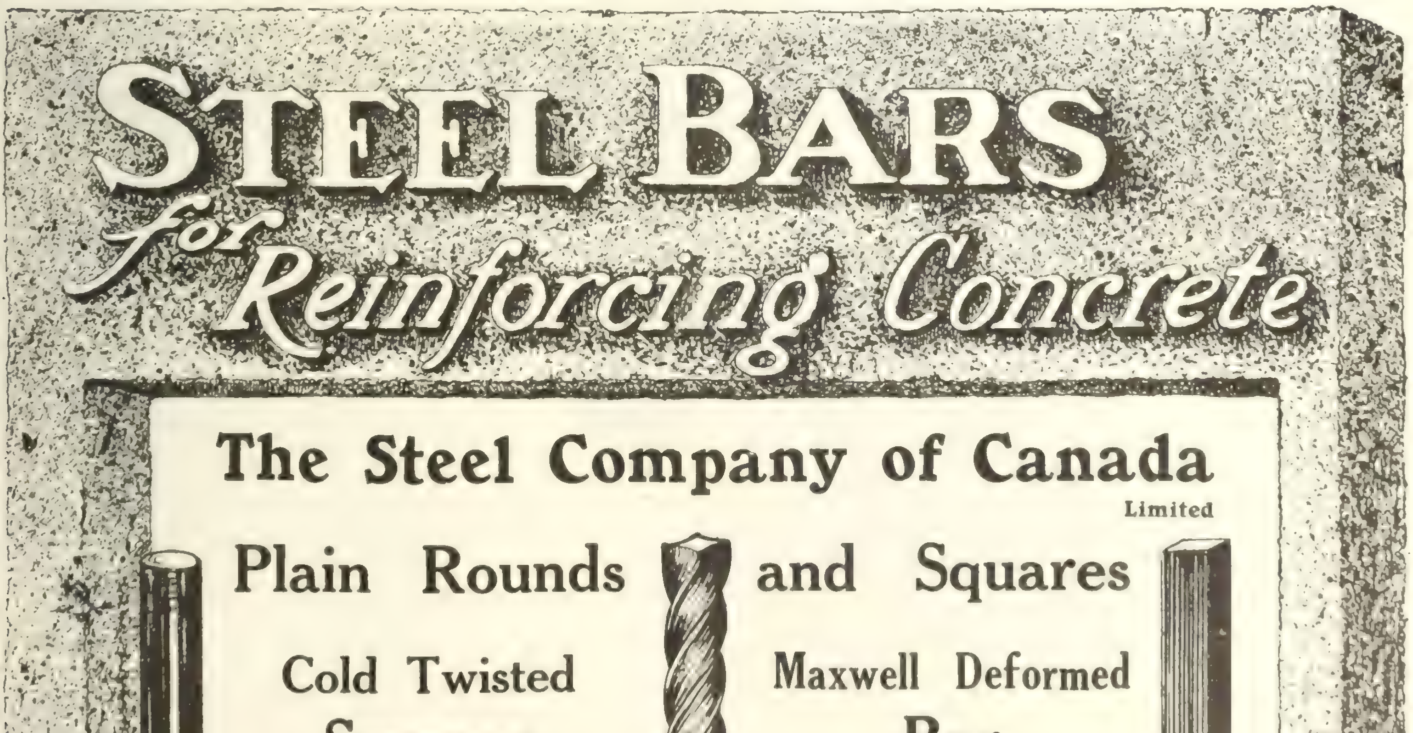
1372-1376 BATHURST STREET - TORONTO

CANADIAN DISTRIBUTERS:

CHILLAS-BLACK, LIMITED
TORONTO

E. F. DARTNELL
MONTREAL

WM. N. O'NEIL & CO.
VANCOUVER



STEEL BARS for Reinforcing Concrete

The Steel Company of Canada
Limited

Plain Rounds and Squares

Cold Twisted Squares

Maxwell Deformed Bar

HAMILTON - TORONTO MONTREAL

J. H. New,
President.

Ryland H. New,
Vice-President.

The BEST Known

BECAUSE

BECAUSE

Established 1860

It DESERVES to BE

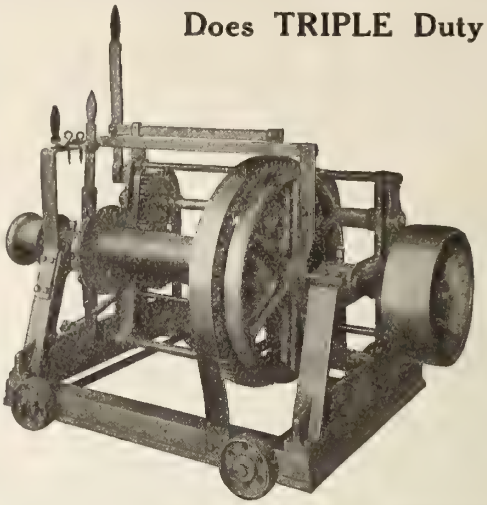
The Hamilton & Toronto Sewer Pipe Co., Limited

HAMILTON and TORONTO

LONG DISTANCE PHONES: Toronto, Adelaide 936, College, 1558
Hamilton, 3990, 3991, 3132

The Parker Reversible Friction Hoist

Does TRIPLE Duty



Run with Gasoline Engine or Motor

No Experienced Operator Required

Drum. Elevator Sheave, Winch-head all operate independently of each other, and are each reversible. This hoist operates a derrick from the drum, a double cage material elevator from the sheave, and serves various other purposes from the winch-head—all on one job.

PAYS FOR ITSELF ON ONE ORDINARY JOB.

"I have used your No. 100 Reversible Hoist for over 5 years. It runs like a clock and has cost me nothing for repairs."

From an Experienced Contractor.

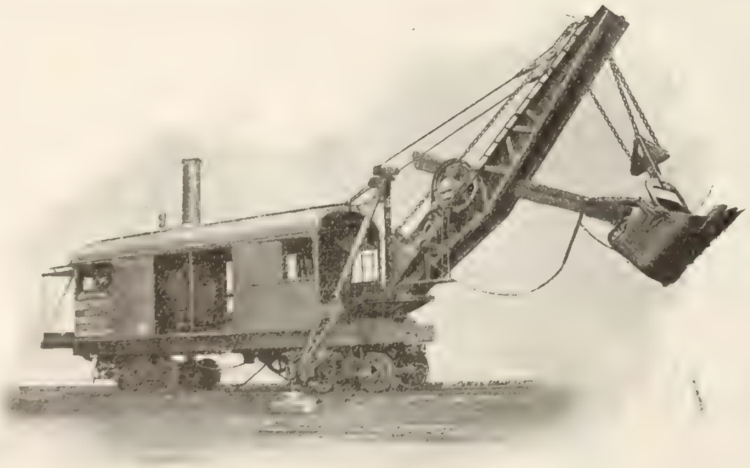
We also build derricks, steam and electric hoists in all sizes. Sole manufacturers of the PARKER PATENTED DERRICKS.

Write for information and prices.

S. E. PARKER, 1800-2 N. Francisco Ave., Chicago, Ill.

Selling Agents:
Gorman. Clancey & Grindley, Calgary and Edmonton, Alta.
J. L. Stuart Machinery Co., Winnipeg, Man.
A. G. Langley & Co., Vancouver, B.C.
F. H. Hopkins & Co., Montreal, Que.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

The

Standard Drain Pipe Co.

Limited

Two Factories:

St. Johns, P. Q. and New Glasgow, N. S.

Manufacturers of

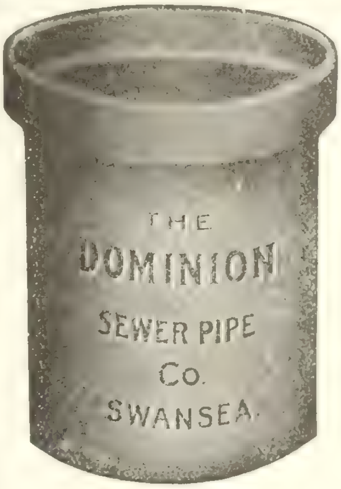
Sewer Pipes, Culvert Pipes, Chimney Linings, Hollow Building Blocks, Fire Clay, Stove and Range Bricks and all kinds of Fire Clay and Vitrified Goods.

Catalogue and prices on application

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES



True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

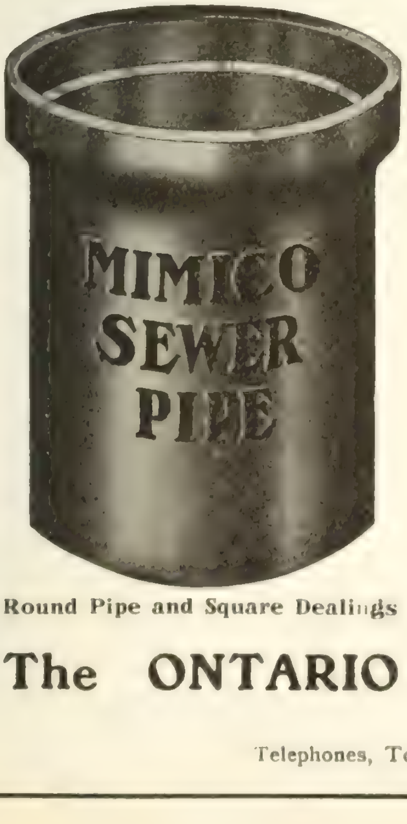
Telephone (Toronto Connection)
Park 1809

The Dominion Sewer Pipe Co.

(The Independent Co.) Limited

SWANSEA (near Toronto)

Mimico Pipe - Is Right



Round Pipe and Square Dealings

It is Vitrified and Salt-Glazed

AND WILL MAKE YOUR

Sewer or Culvert

A Credit to You

AS SMALL AS 4 AND AS BIG AS 24
SINGLE AND DOUBLE STRENGTH

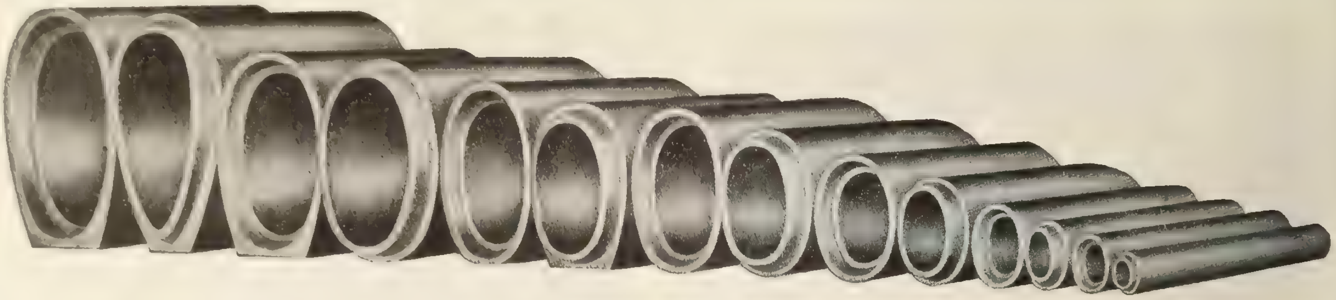
Orders Promptly Filled

Try Us

The ONTARIO SEWER PIPE COMPANY, Limited

MIMICO, ONTARIO

Telephones, Toronto Connection, Park 422; Evenings, Park 3888 and 3889



We Guarantee Our

Reinforced Concrete Pipe

for Culverts and Sewers

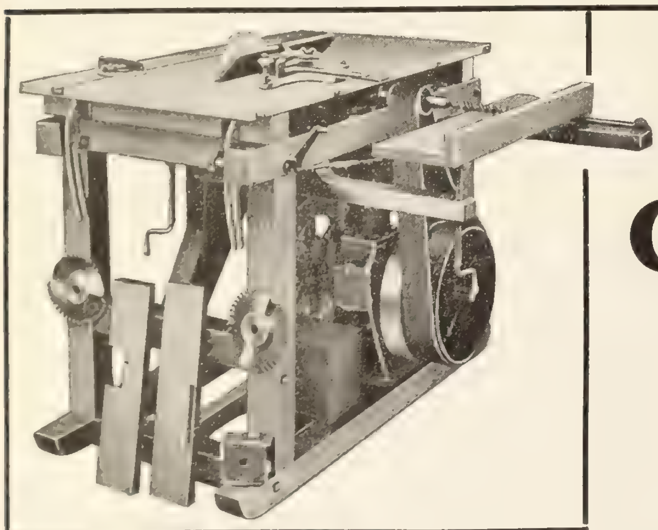
"Long Service at Low Cost"

Our **Pipe** is **frost-proof, indestructible** and **everlasting.** It is easily handled, easily placed, and easily procured. It has been approved by **most particular, most renowned, most experienced,** and **most skilled engineers.**

Stock sizes 6 inch to 48 inch. Other sizes to order. **Write for catalogue and prices.**

Dominion Concrete Company, Limited

KEMPTVILLE - ONTARIO



On Every Concrete Job

You can save 10 to 15 per cent by using our Contractor's 'Portable Saw and Variety Woodworker.

Now is the time when you are starting to do your concrete work and this saw will be just what you are looking for—a cheap practical saw that will prove itself a time saver and money maker for you.

CONTRACTORS SUPPLIES OF ALL KINDS

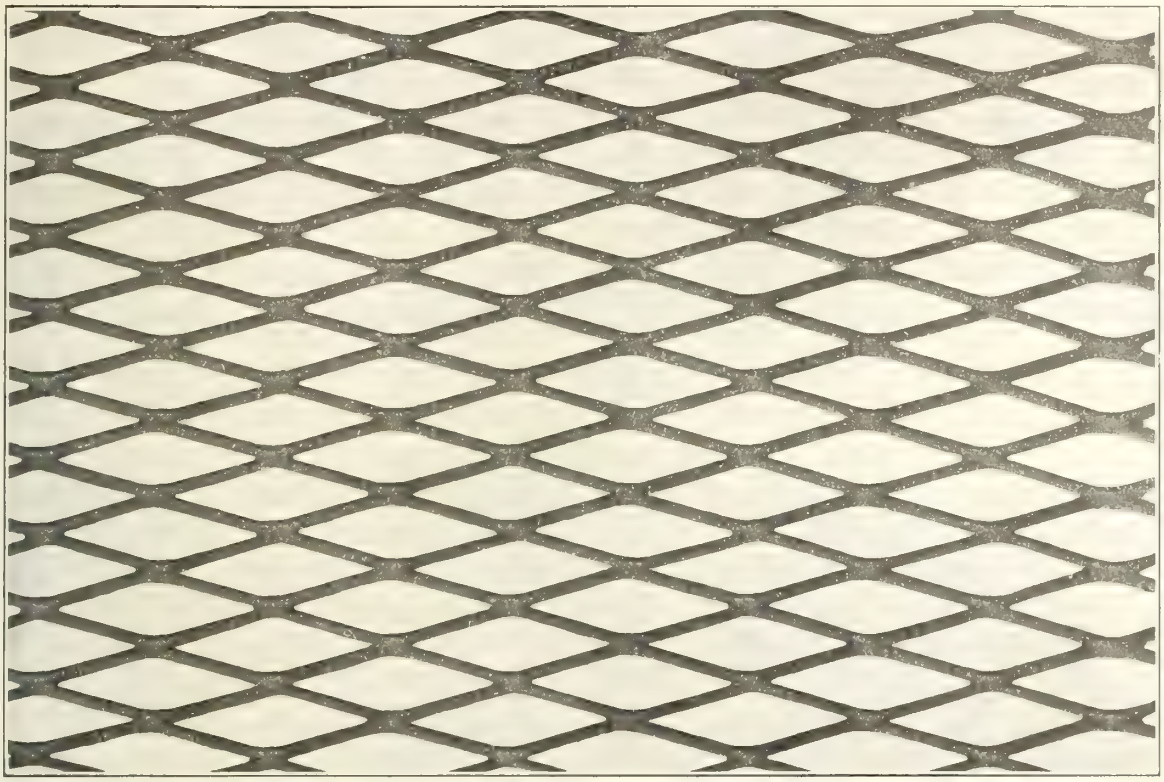
The Canadian Fairbanks Co., Limited

Fairbanks-Morse Gas Engines, Fairbanks Scales. Safes and Vaults.

Montreal Winnipeg Toronto Vancouver
St. John, N.B. Calgary Saskatoon Ottawa

WHAT IT IS

A Rip Saw
A Matcher
A Mitre Saw
A Cut-Off Saw
A Dado Machine
A Jointer
A Boring Machine
A Gaining Machine
A Grooving Machine
A Babbitting Machine
A Moulder with Self-Contained Power



"Steelcrete" Diamond Mesh — the Lath with a Reputation

Since Expanded Metal was first made in Canada "Steelcrete" has been the acknowledged standard from Coast to Coast.

To-day, there are more yards of it in actual use, probably, than all other Canadian Laths combined—a few "Steelcrete" jobs being the King Edward Hotel, Toronto, the Royal Mint, Ottawa, Ontario Parliament Buildings, Toronto, Winnipeg Post Office, new East and West Blocks Dominion Parliament Buildings, Ottawa.

"Steelcrete" Expanded Metal Lath

—weighs 3½ lbs. per square yard—half as much again as is claimed for laths of same gauge.

—acquiring rigidity by shape and weight of strand has no raised ribs or beads to bury—hence makes plastering easier, quicker and cheaper.

—being made in sheets 30″ wide wastes only half as much in laps and costs only half as much to apply as other laths.

—is made by same process and with same care and precision as heavy expanded metal therefore is perfectly flat and straight.

Samples, Prices and Lath Catalogue on Request.

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE FRASER AVENUE

MONTREAL
138 CRAIG STREET WEST

St. John—13 Germain St.
Quebec—153 St. Paul St.
Ottawa—83 Banks St.
Regina—Black Block

Fort William—113 N. May St.
Winnipeg—334 Garry St.
Calgary—309-8th Avenue.
Vancouver—416 Pacific Bldg

Corinthian Stone

is extensively used for Churches, Schools and Colleges. In trimmings for brick or stone work, it is without an equal. Special prices for any work where a large quantity of repetition occurs.

St. Jerome College, Berlin, Ontario.

A large quantity of Corinthian Stone was used in building this well-known College. Estimates given for all classes of work. Send plans or write to

The Corinthian Stone Co.

OFFICE AND WORKS:
G. T. R. JUNCTION, GUELPH, ONTARIO

TENTS

for Engineers and Contractors

We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

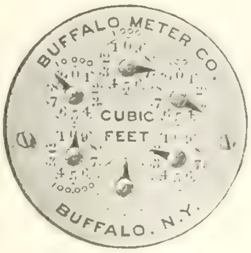
Send for our catalogue
It will interest you

Woods Limited

Woods Building - Ottawa, Ont.

AMERICAN AND NEW NIAGARA

WATER METERS



Standard Dial

Straight Reading Dial

Jewel Bearing
Intermediate Gears
Self Cleaning and Sanitary
Adjustment for Pressure
Extra Thick, Strong Disc
Accuracy Guaranteed
Fewest Parts

BUFFALO METER CO.

290 TERRACE, BUFFALO, N. Y.

The United States Steel Corporation, at Gary, Ind.;
Stone & Webster Engineering Corporation, Minneapolis, Minn.;
A. Monsted Co., Milwaukee, Wis.;
Geo. B. Swift Co., 903 Security Bldg., Chicago.;
Pacific Coast Condensed Milk Co.. Seattle, Wash.;
Sheffield Farms-Slawson Decker Co. Amenia, N.Y.; and
Inland Steel Co., Indiana, Ind.,
are among the largest users of concrete in the United States. They and many others, are using

REICHERT METAL FORMS

And saving from 3 to 7 cents per square foot.

Why do YOU stick to the old methods and let this additional profit slip away from you?

Building a big factory building with Reichert Metal Forms. Pacific Coast Condensed Milk Company's plant at Berlin, Wis. Stone & Webster Engineering Corporation builders.

REICHERT MFG. CO.

MILWAUKEE, WISC., U.S.A.

Neptune Meter Co.

Manufacturers of the well-known

TRIDENT Frost-Proof Water Meters

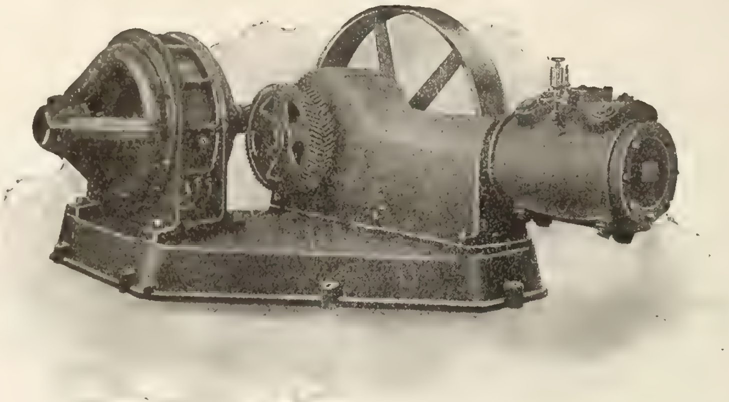
Write for Catalogue

Main Office - 90 West Street

New York City

Portable, Gear Driven

COMPRESSORS



Rand Class "NE—1" Straight Line Compressor mounted on a rigid sub-base and geared direct to an Electric Motor. A high speed, simple and perfectly automatic machine particularly adapted to contracting duties, where electric power is available.

The gear driven Class **"NE-1"** Compressor is a simple, reliable design in which automatic operation is combined with great power economy. This type permits of the advantage of direct electric drive at a very moderate first cost.

It is a well known fact that power economy is best effected by generation from a central plant.

Why not take advantage of this direct electric drive and economize on your power consumption, instead of generating your own power by small expensive boiler units.

Class "NE-1" Compressors are built in standard capacities of 50 to 300 feet free air per minute. Pamphlet K-92.

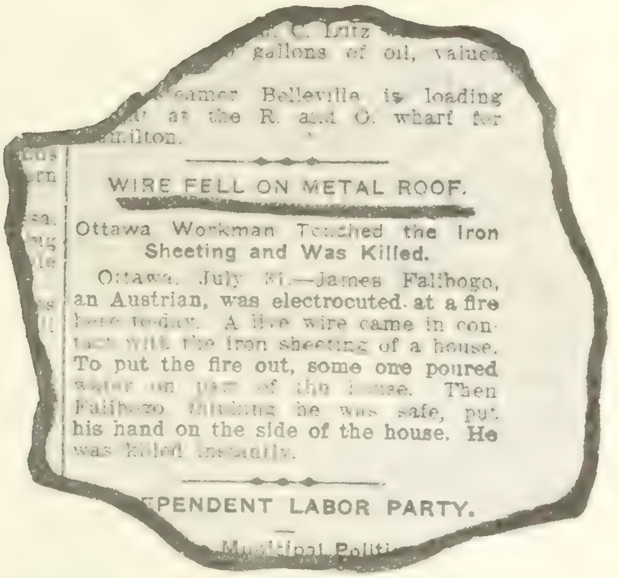
PNEUMATIC TOOLS ROCK DRILLS

CANADIAN RAND CO., LIMITED

Commercial Union Building, MONTREAL, CAN.
Toronto, Cobalt, Winnipeg, Lethbridge, Rossland, Vancouver, Halifax
South Porcupine Spokane Sydney

"Asbestos Shingles"

Would have saved this life and prevented this fire



C. Lutz
gallons of oil, value

eamer Belleville is loading
ht at the R. and O. wharf for
milton.

WIRE FELL ON METAL ROOF.

Ottawa Workman Touched the Iron Sheeting and Was Killed.

Ottawa, July 31.—James Fallbogo, an Austrian, was electrocuted at a fire here to-day. A live wire came in contact with the iron sheeting of a house. To put the fire out, some one poured water on part of the house. Then Fallbogo thinking he was safe, put his hand on the side of the house. He was killed instantly.

PENDENT LABOR PARTY.

Municipal Politi

From the Evening Telegram

As demonstrated by the above accident, metal shingles are not always fireproof, *but are fine conductors.* In this age when electricity is being so extensively used, and generally transmitted overhead, every architect and engineer should see that his roofing material is "Fireproof in every respect," and a Non-Conductor of Electricity.

Asbestos cement slates like cement itself improve and hardens with age, can never burn nor transmit electricity.

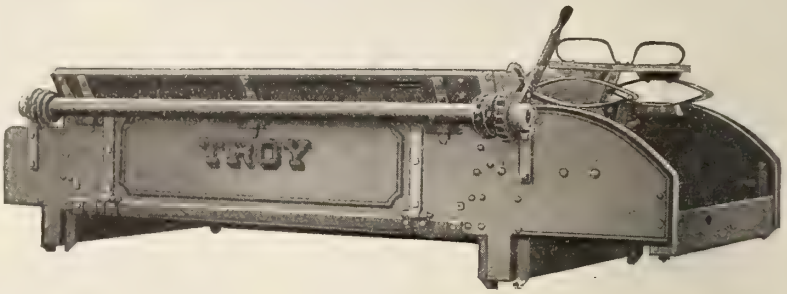
ALWAYS SPECIFY

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P. Q.
Factory at Lachine, P. Q.

Five Hundred Troy Dump Boxes Wont Last Long at These Figures



We want to demonstrate quickly to the largest possible scope of territory the great saving that can be made by the use of TROY Bottom Dump Boxes in connection with regular teaming gears on all dirt moving jobs.

We want to reach the team-owners and contractors who don't know TROY Dump Boxes. Many of them have never seen a TROY and won't believe the saving until they do see.

One TROY Box in a community means an order-getting booster for us. Every sale means more sales and lots of them. That is why we have set aside 500 TROY Boxes for special advertising purposes.

But we must Limit Purchases under this Special Proposition to One Box per Customer

Our regular price for the 1½ yd. Box is $45.00 each and for the 2 yd. Box, $50.00.

We will furnish 500 Boxes at the following special advertising price—good only as long as the 500 Boxes last and no order accepted at these figures after September 1st, 1911.

Special Advertising Price, 1 1-2 Cu. Yd. Box............ $36.90 each.
" " " 2 Cu. Yd. Box................ $40.20 each.

Terms net cash with order, F. O. B. Troy, Ohio. Boxes furnished to fit any size gear.

First come, first served. They are going fast. If you want a TROY Box at these figures, MAIL YOUR ORDER TO-DAY.

THE TROY WAGON WORKS COMPANY
North Market St. TROY, OHIO

FILE YOUR PLANS

Free of charge at any of the four offices of the

"CONTRACT RECORD"

Contractors and manufacturers of building, municipal, railway, and power plant equipment not only expect to see your tenders advertised in the "Tenders' Department" of the "Contract Record," but they will also find it a great convenience if you place your plans and specifications on file at any or all of our four offices, viz. Toronto, Montreal, Winnipeg and Vancouver.

Send along your next Tender Advt. together with Plans and Specifications

CONTRACT RECORD
220 King St. West, TORONTO

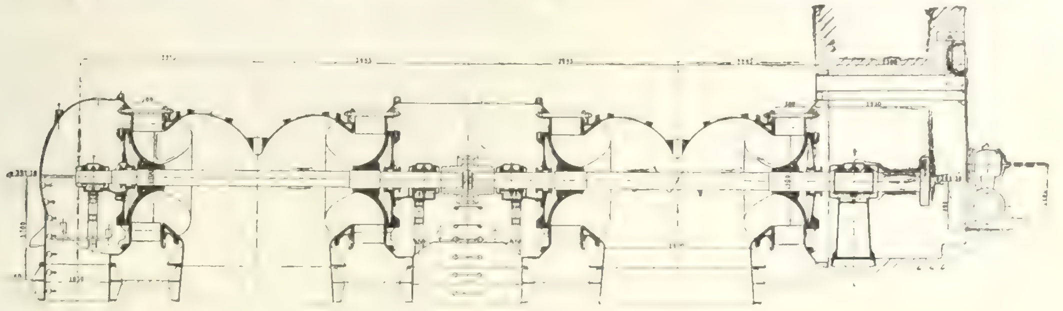
MONTREAL
Board of Trade Building

WINNIPEG
Travellers Building

VANCOUVER
Crowe & Wilson Chambers

WATER-POWER PLANTS LOW PRESSURE TURBINES

Any Output. 5,000 Turbines Supplied. 2,000,000 Horse Power.



26 ft. Head. 5,000 H. P.
Four Units as illustration on order for the German-Swiss Water Power Company

ESCHER WYSS & CO. - ZURICH, SWITZERLAND

CANADIAN HEAD OFFICE, 408 LUMSDEN BUILDING, TORONTO
PHONE, ADELAIDE 234

Make Good on Your Contract

If the specifications call for metal ceilings, make your customer more satisfied and add to your reputation by selecting Preston Steel Ceilings. Thus you will make good for sure on that part of the construction.

You should induce your customers to build or repair with metal ceilings rather than with plaster. For only a metal ceiling is fireproof and sanitary, as well as permanent.

In Preston Steel Ceilings the choice lies among over eleven hundred up-to-date designs. Each is deeply embossed, the patterns clear-cut, and the finish perfect.

Preston Steel Ceilings

Other building specialties we carry in immense stocks include Metal Shingles, Siding, Corrogated Sheets, Skylights, Ventilators, Finials, Herringbone Lath, Fireproof Windows, Canada and Terne Plate, Black Sheets, Copper and Galvanized Sheets, Gravel Roofing, Tinners' Supplies, etc., etc. Prompt shipment at all seasons.

Send for Pattern Book and Price Lists

Metal Shingle & Siding Co. Limited
Preston, Ontario

Renfrew Lime

Will make more mortar per 100 lbs. of lime than any other kind, and will save you 75 cents per day on each bricklayer. At the end of a year your savings would pay for the lime.

The quality of "RENFREW" Lime is very superior and it will pay you to use it.

'Renfrew' the Lime of Quality

Jamieson Lime Co.

RENFREW, ONTARIO

White Lime - Stone - Grey Lime
Brick - Drain Tile

Engine Room Duquesne Freight Station, P.R.R., Pittsburg, Pa.
McLaughlin & McLaughlin, Contractors.

HERCULES
Waterproofing and Strengthening
COMPOUND

ABSOLUTE IMPERMEABILITY

The Waterproofing Work done in the Pittsburg Terminal Station of the Pennsylvania Railroad, was that of surfacing old work in the basement. A heavy wire brush was used to scar the surface, and a first coat of cement waterproofed with Hercules compound applied, evening up the surface; immediately after which a final coat, approximately one inch thick, was applied under pressure.

The leading engineers of the country recommend it because it guarantees absolute impermeability together with **increased** tensile strength.

For Concrete Foundations, Blocks, Stucco, Masonry Bins and Cement Work of all kinds.

Write for Booklet of Tests.

Increased Density and Strength

HERCULES WATERPROOFING COMPOUND

To be mixed with ordinary cement, a fine ground powder, which, when mixed with the cement before the addition of the sand and water, not only renders the concrete waterproof, but increases its strength from 20 to 35 per cent.

HERCULES LIQUID WATERPROOFING

A thin, colorless liquid to be applied on set concrete with a brush, two coats being sufficient to render the concrete absolutely waterproof. One gallon covering about 150 square feet.

DISTRIBUTORS:

Toronto—Ontario Lime Association Ltd. **Ottawa**—D. J. MacKenzie.
Welland—David Dick & Sons. **Niagara Falls**—W. E. Thomas.
Montreal—Alexander Bremner, Ltd. **Hamilton**—Drake & Avery.
St. Catharines—Wilson Lumber Co.

HERCULES
Waterproof Cement Co.
BUFFALO, N.Y.

The

Rogers Supply Co.

28 King St. West - - - Toronto

Stone

Cement

Sand

Prompt Delivery Service ::: Main 4155

See

Smyth & Ryan

for quotations on

Lime, Stone, Cement, Sewer Pipe, Weeping Tile, Mortar Colors, Plaster, Etc.

TORONTO AGENTS FOR

OWEN SOUND CRUSHED STONE

Deliveries, G. T. R. and C. P. R.

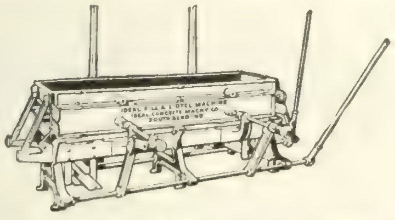
Head Office, 1327 Bloor St. W.

Phones, Junction, 828, 829.

Branch Yard, 53 Merton Street

G.T.R. Belt Line Phone North 1751

Night and Sunday Calls, Phone, Parkdale 2198.



MR. CONTRACTOR!

you can make Dimension Stone
of almost any size with

'IDEAL' SILL-LINTEL and DIMENSION MACHINES

These illustrations show the possibilties of having "Ideal" Machines of your own.

They are not only suitable for making Sills, Heads, Lintels, String Courses and other ornamental work, but also in turning out your own Dimension Stone of almost any size, from white and colored brick for fireplaces, etc., to columns.

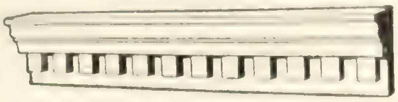
Write for catalogues, illustrating and describing these time-saving, money-making machines which every Contractor and Builder should own.

IDEAL CONCRETE MACHINERY CO., LIMITED

Dept. B - London, Ont.

We can also supply Concrete Mixers, Ornamental Molds, Tile Molds, Fence Post Molds, Tycrete Waterproofing, etc.

Reliable and energetic agents wanted in every locality



We Deliver to Any Point
All Grades

— SCREENED —

SAND AND GRAVEL

York Sand & Gravel Co.

EAST TORONTO

TELEPHONE: Beach 233

Sarnia, Canada

ESTIMATES AND DESIGNS FURNISHED ON APPLICATION

WE ARE MANUFACTURERS OF

Structural Steel
of All Kinds

Railway and Highway Bridges

Steel Buildings

Beams, Channels, Angles, Plates, etc.
IN STOCK

The Des Moines Hemispherical Bottom Steel Tanks and Towers

have been used and approved by nearly all leading Engineers. They are undoubtedly the most economical means of storing water at an elevation.

We have built many of these in Canada the United States and Mexico. Estimates cheerfully furnished.

Send for Catalog No. 15

Des Moines Bridge & Iron Co.

Pittsburg, Pa., U.S.A., 945 Curry Bldg.
Des Moines, Iowa, U.S.A. 938 Tuttle St.

Steel and Wood TANKS

Suitable for Sprinkler Systems Fire Protection, Water Supply Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines, Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

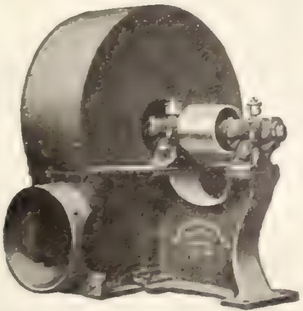
263 Armstrong Ave., Jersey City, N. J., U. S. A

RADIAL BRICK CHIMNEYS

H. R. HEINICKE, Inc.

65 Victoria St., Montreal, Que.
Mail Building, Toronto, Ont.
147 Fourth Ave., New York

Consult Us—We are Experts—30 years' experience—Chimneys in all parts of the world



Sturtevant

Stock Fans

Embrace such a diversity of types and sizes that nearly any ordinary conditions of fan engineering may be met by a fan shipped from stock.

Spare parts always ready for immediate shipment.

STURTEVANT Engineers suggest and recommend apparatus to meet requirements.

ASK THEM. 863

B. F. STURTEVANT, Hyde Park, Mass.

Polson Iron Works Ltd., Toronto Eadie-Douglas Ltd., Montreal

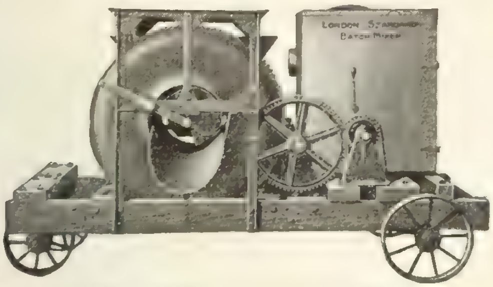
SHAWMUT VITRIFIED PAVING ——BRICK WORKS——

SHAWMUT PA. ALFRED YATES, GEN. MGR

Vitrified Shale and Fire Clay Paving Bricks and Blocks

Burned in Yates' Patent Kiln

Samples and Prices on Application



London Standard Drum Batch Mixer No. 1
Equipped with Gasoline Engine

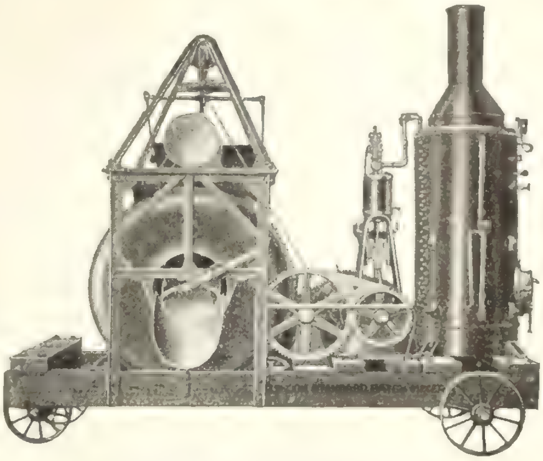
London Standard Batch Mixers

THE LONDON STANDARD DRUM BATCH MIXERS are made in four sizes, namely, one-third yard, one-half yard and one yard batches and are furnished with any equipment.

THE MANY NEW AND IMPROVED FEATURES of the London Standard Drum Batch Mixers appeal to every contractor desiring a mixer of this type. WE CAN GIVE YOU THE BEST VALUE FOR YOUR MONEY of any Firm doing business, BECAUSE we manufacture only Concrete Machinery, and on this account we can sell you a machine at very much less cost than Firms who do not manufacture their own machines but handle a concrete mixer along with other lines of goods.

We also Manufacture—
FACE-DOWN BLOCK MACHINES
CEMENT BRICK MACHINES
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES
SEWER PIPE MOLDS
ORNAMENTAL MOLDS SILO CURBS
ADJUSTABLE SILL, STEP AND WINDOW
CAP MOLDS FRICTION HOISTS
And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.



London Standard Drum Batch Mixer No, 2 equipped
with Steam Engine and Loading Skip

London Concrete Machinery Co.
Limited
19 Marmora St., LONDON, CANADA

Branches
A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
Hamilton Machinery Co., 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.
Foss & Hill Machinery Co., 329 St. James St., Montreal.

(See Our Exhibit at Toronto Exhibition, South-east of Machinery Hall, or London Exhibition in Cement Machinery Hall.)

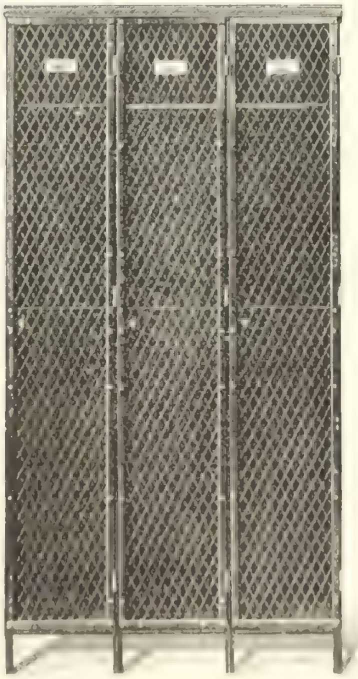
Star Drilling Machines

The "Drillers Friend"

"The Whole Driller Family Praise The Stars"

The General Machinery Co., Ltd.
526-7 Traders Bank Building
TORONTO, ONT.

'Meadows' Metal Lockers



Make friends because of their substantial construction and unique features. We make several styles and sizes of these lockers. We'll know what you want if you just hint at your requirements.

Send for our interesting booklet entitled
"Locker Lore"

GEO. B. MEADOWS
Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA

EADIE-DOUGLAS LIMITED

HEAD OFFICE: 12-14 University Street, MONTREAL

Building and Mechanical Supplies and Specialties

BRANCH OFFICES:
TORONTO, - - 65 Victoria Street
WINNIPEG, - - 445 Main Street
OTTAWA, - - 198 Queen Street

REPRESENTING

Leeds Fireclay Company

Burmantofts Architectural Terra Cotta and Enameled Brick. Used by leading Architects and in representative buildings throughout Canada.

"Keystone" Fireproofing Company

Keystone Gypsum Partition Blocks and Furring. Fireproof, Soundproof, better and cheaper than Terra Cotta.

"Esco" Steel Coating and Preservo

A Waterproofing preservative paint for steel, wood and concrete. The solution of all paint difficulties. **PRESERVO—A preservative and waterproofing** for canvas.

"Terrano" Flooring Co'y of Canada, Limited

Terrano Jointless, sanitary flooring. Laid throughout the world, in hospitals, schools, hotels, private houses, power plants, factories, warehouses, etc.

Alphons Custodis Chimney Construction Co.

Custodis Radial Brick and Concrete Chimneys. Are in service in the largest plants in Canada and are lasting monuments to good judgment and business enterprise.

Edward Darby and Sons Company

"Pen Dar" Metal Lockers are the standard throughout Canada. The strongest and best constructed metal lockers, in all different styles and prices.

Mellows & Company Limited

Eclipse Lead Covered Clazing Bars for skylight Construction. Last a lifetime without any painting or repairing. MELLOWS STEEL SASHES AND CASEMENTS.

"Insulyte" Company Limited

A complete organization for the selling and installing all classes of insulating material.

B. F. Sturtevant Company
(Eastern Canada Only)

Sturtevant Electric Vacuum Cleaners, simple, effiicient and lasting. Ventilating and Heating apparatus, engines, motors, etc.

Send for catalogues and descriptive matter on any of the above lines that you are interested in.

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

THE STANDARD Ideal COMPANY LIMITED

GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

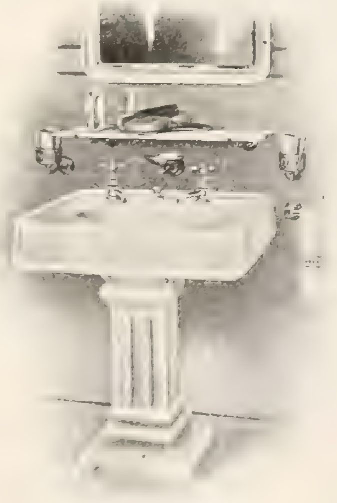


Plate F 112

We have improved the shape of pedestal on THE STANDARD Ideal lavatory F 112 which is now supplied as shown in this cut.

This change in pattern (without increase of price) produces a handsome and substantial combination.

ORDER ONE FOR YOUR SHOWROOM

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 Beaver Hall Hill

WINNIPEG
76 82 LOMBARD ST.

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MacLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.
HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 August 23, 1911 No. 34

The City Architect's Extension of Time

At a recent meeting of the Fire and Light Committee of Toronto an extension of five months' time was granted to the city architect in which to finish his report on the Memorial presented to the Mayor and Board of Control by the Citizens' Committee a few months ago. At the time of presentation the city architect was given until August 1st in which to make his report on the Memorial, and the recent extension of time by the Fire and Light Committee has occasioned some little indignation which resulted in calling a meeting on Wednesday afternoon for the purpose of discussing this new turn in the situation.

At this meeting the fact that the bulk of the building operations for 1912 will be dependent on the present by-law if not placed in hand for revision before the beginning of the new year, was largely dealt upon, and it was deemed advisable to wait upon the Board of Control at an early date with a view to laying the entire situation before them, and vigorously asserting the necessity for immediate action being taken to secure the much-needed revsion.

The Memorial has been discussed thoroughly from every point of view since its presentation last May, and the points in its favor have strongly been brought out. The investigations of the Committee in compiling this valuable work, necessitating on their part an expenditure of considerable time and energy, which were so gratuitously given, make this extra delay in their good work appear to be unoccasioned. Although during the past four months the city architect's department has been extremely busy, no such present conditions of affairs should warrant the continuation of building operations on a basis that, in the opinion of the citizens, is faulty and incomplete. Why not proceed with the revision with all possible speed in order that future building might have its benefit? At any rate the building operations of the spring of 1912 should of necessity be based upon a revised by-law rather than allow a repetition of the state of affairs at present in Montreal. Here, owing to a revision in the midst of the building season, the by-law had to be amended to allow practically all this year's building to be proceeded with, without complying with the new regulations regarding fireproofing, etc. This will be the condition of affairs in Toronto next year unless the revision is made within a reasonable time after the presentation of the Memorial. Any motive that the Fire and Light Committee may have in extending the time until Mr. McCallum makes his report, should be based upon the excessive urgency of the occasion, and upon the fact that there are a number of buildings in project that have waited a whole season for a satisfactory decision, and that will otherwise be obliged to be held over until next year, unless justice is dealt them by way of a speedy report on what has now had nearly four months' time for preparation. The advantage of this extension until 1912 is certainly not evident.

The Sanitary Adviser

The example of city council indiscretion that received some comment in the Contract Record of August 9 brought in replies to the effect that crossing the border for illustrations of this practice was entirely unnecessary, and that there were municipalities in the Dominion suffering as a result of the incompetency of their men in office to appreciate the value of offered sanitary engineering knowledge. No specific response need here be quoted as each case pointed with wonder to the fact that certain civic officials, upon whom the responsibility of the community rested, should have such lack of regard for the future health of citizens as to instal apparatus pronounced inefficient and still in the stages of experiment. Morover, mistakes do not appear to be those of an individual but of a council or corporation.

The importance of sanitary engineering is always evident. Apart from our ideals of dominion, our schemes of railway development, canal systems, and multitudinous methods of transportation and inhabitation, the maintenance of ourselves in a normal state of health is a prime requisite. It has elsewhere been stated that no community can go beyond an available water supply at the rate of 30 gallons of potable water per head per day. An experienced sanitary engineer in this city has said that no two people can exist anywhere beyond available supply.

It is true that this branch of engineering is one apart from such problems as bridge building, railway work, power development or the laying out of a new country. The work of a sanitary engineer besides including the making of surveys, measuring of quantities and estimating of costs, would also include the study of the character of available water in a given area, followed by his ability to lay up both physical and chemical data, to draw deductions, and to tell a community just how far it can go before a change must be made in its water supply. It is obvious that the character of the water is most important, underground water being a mixture or often a chemical compound, its constitution dependent upon the absorption of soluble quantities of foreign matter taken up from the strata, and surface water being dependent upon the absorption of forms of vegetable growth and decay. In short, water is no longer water alone but presents, upon analysis, intricate chemical formula, sometimes organic, sometimes inorganic, or both. An article on page 51 of the last issue of the Contract Record analyzes this problem concisely, and in its last paragraph states that the judgment passed upon the desirability and safety of a water for drinking purposes was based upon an accumulation of evidence from all possible sources, and that the past and present history of the water and of its surroundings must always be included.

The work of the sanitary engineer, therefore, is a very important one, and is as absolutely necessary as it is difficult, since, in the interests of the average community, no other branch of engineering presents such problems of vital importance as those connected with the obtaining of a sufficient healthful water supply for household use. These problems are comparatively new in many parts of the Dominion and are fast increasing in number and variety. It is regretable that there is a simultaneous scarcity of sanitary engineers in Canada, since, whenever an expert is required to advise, an outsider is of necessity, called upon as the services of our own consultants in this work are in such demand as to be often unavailable for some time. Universities of the Dominion are seriously considering adoption of courses which will so draw upon engineering and medical sources of instruction as to properly fit men for this important work. Graduates equipped with thorough and up-to-date instruction in this work in the Dominion will assuredly have ample opportunities for attaining success and distinction. It would be commendable at the outset, however, to equip a number of our city councils with an accumulation of knowledge from such a source, as it is evident that their co-operation with the few fully competent sanitary engineers we now have in the Dominion would then solve at least a small number of the many problems that at present exist.

The Work of the Surveyor

An architect and surveyor of 20 years experience in North England in the person of Jas. J. Adamson, of Montreal, in a reply to the editorial entitled "Quantity Surveyors" in the August 2 issue of the Contract Record, imparts a number of important points that are well worthy of consideration. Mr. Adamson regularly took off and supplied quantities for all his work and is an authority on the subject of surveying. According to his letter the Architects' Association and the Master Builders' Association in his native city of some 30,000 inhabitants met some years ago and by mutual arrangement, agreed that quantities should be supplied for all works estimated to cost over $1,250. His letter goes on to state:

There "Unity is strength," and the master builders were and are a strongly united body, while here in Montreal they appear to me to lack this essential, and thereby waste no end of valuable time "figuring" on various plans, and in very many cases "guessing" what many of the items are, often, no doubt, to the detriment of both owner and contractor.

The Quantity Surveyor is not there to figure out the cost of the material in any case, but to give the accurate quantity in yards, feet, squares, and inches, of all material required for each job, with a brief description of each item. These quantities are then lithographed and the result is, as you say, a concise and explicitly detailed specification. Each contractor who desires to tender is supplied with a copy and can sit down and fix up his own price to it in one-fifth of the time it takes him to figure on plans and specifications under the present system in Montreal, which system, to my mind, is antiquated and unbusinesslike. If, for instance, a mason contractor is asked to make up a general, full, or whole tender for a building, he is given a set of blue prints and a specification, he first figures out his own work, and then must pass the plans to the other trades, and it may take him ten to fourteen days to get their results before he can complete his full tender. If on the contrary he had a full set of quantities, he could, on the day he received them, detach each separate trade, mail them to his friends, the sub-contractors, and unless it was an exceptionally big job, could have their prices back by return mail, thus saving no end of valuable time for all.

The most important objection that I have met with, in Montreal, is the question of payment for the quantities.

In England the charges are two and one-half per cent., and these charges are always added to the amount of the tender, and paid to the quantity surveyor, or architect, by the contractor who secures the work, out of the first certificates he receives and the unsuccessful contractors pay nothing. This conclusively proves that the building owner pays for quantities, and it is decidedly to his advantage to do so. The uninitiated may not think so, but when it has been fully explained to him (the owner) that the quantities are taken off by experienced and qualified men, that by this method he only pays for the exact yards of excavating, number of bricks, squares of flooring, yards of plastering, etc., and that there is no guess work about it. I have never yet found a client who objected to pay rather than leave it to chance methods or rule of thumb.

On the contract being awarded, the successful contractor is given a second copy of the quantities, these he fully prices out and hands back to the architect, the detailed price therein then form a schedule on which any extras are charged or deductions made on the contract.

An important matter like this should be adjusted here without much difficulty by, say, a deputation from the Master Builders' Association waiting upon the committee of the Architects' Association and fixing up details. It would mean money to both parties, save time, which is money, and save many disputes.

Should any of your readers desire further details I shall be pleased to hear from them or to take off quantities for them at any time.

Faithfully yours,
JAS. J. ADAMSON.

Mr. Adamson corrects an impression made by the previous editorial as to the work of pricing material falling to the surveyor, the function of whom is to take off an itemized bill of quantities which should include everything that enters into the construction of the building and submitting the same to the architect, who in turn forwards copies to the builders, together with plans and specifications for estimating. The return of this to the architect has the advantage of being an itemized tender as the bidder has only to append his prices to the list of quantities already contained therein. It is obvious that any extras or omissions that may be reckoned with after the contract is awarded will be manipulated on the same basis and will thus eliminate what has in past years been a fruitful source of trouble in this country.

The existence in Canada of commercially available clays suitable for the manufacture of better grades of stone ware and pottery has not as yet been definitely determined, although it is quite reasonable to expect that such clays will be found, particularly in the western portion of the country.

Some Conditions Affecting Dam Trenches

The Part that Geology Plays in Governing Trench Excavating—The Location of Water-tight Strata — The Necessity of Perfect Water-tightness in Trench Work

In a paper read before the Association of Water Engineers of England, Dr. Herbert Lapworth asserted that the selection of an efficient and economical site for a dam and the question of deciding when water-tight strata have been reached in the trench excavations form two of the most difficult problems with which the water engineer has to contend. In reservoirs, as in other engineering works, each case has its own peculiarities; and for this reason it is impossible to lay down rules except on the very broadest lines. There are, however, a few general principles that appear to be common to many dam trenches.

The site of the reservoir having been determined and the approximate position of the dam fixed, a contoured geological map of the site and the area for some distance above and below should be prepared, he said. A mere inspection of the surface indications and a note of the geological beds or strata alone are not sufficient. The various beds should be plotted on a fairly large scale, not less than 1/2500th, so that the map shows the order and levels of the strata.

No geologist will say that it is possible to prepare a detailed geological map of every dam site without considerable help from trial shafts or borings, in fact, the detail required for this kind of work renders the sinking of numerous shafts almost imperative. In the author's opinion, no expense should be spared in these initial explorations. An expenditure of several thousand pounds is trivial in proportion to the saving that may be effected by such means. Some engineers prefer bore-holes; but these are not nearly so satisfactory as trial shafts, Dr. Lapworth said, which should not be less than 8 or 10 ft. square, and in the superficial deposits should be well timbered from the commencement. They should be sunk to a considerable depth, occasionally well below what will probably be the final depth of the trench, in order to make perfectly certain that the water-tight strata continue downwards.

The ideal dam is one which has the whole length of its foundations in water-tight rock with all percolating ground water above the level of the foundations. The object of the trench, of course, is to sink below all loose, open, and unstable materials; these bring: (1) Superficial deposits, such as alluvial and glacial beds of sand, gravel and clay; (2) surface material broken up by weathering and surface movement; (3) surface or sub-surface material broken up by faults, folds and joints; (4) sub-surface material of a porous or water-bearing nature; and in masonry dams (5), sub-surface material not sufficiently firm to take the weight of the overlying dam. In England, dam foundations are sunk down to, and well into, the solid rock, invariably in the case of masonry dams and generally in the case of earth embankments.

In Great Britain, the superficial deposits consist principally of alluvial and glacial material, and of these only the latter offer serious trouble in dam construction. These glacial beds consist of sheets or masses of clay, gravel and sand, sometimes of enormous thickness, and deposited in a more or less promiscuous manner over the solid rocks. They are distributed irregularly over Britain north of a line joining Bristol to London, and occupy, in general, the bottoms of the valleys. They may be considered the bugbear of the water engineer in selecting a site for a reservoir embankment, for the very simple reason that their surface indications are very little guide as to what may be expected below in the trench excavations. In this the glacial deposits differ materially from the solid rocks, in which it is sometimes possible to predict fairly accurately what will be met with underground. For this reason, in all cases where glacial deposits are known to cover the solid rocks, it becomes imperative to make an exhaustive examination of the site by means of shafts and the like, before settling on the final central line of the trench, not only because of the uncertain local distribution of these materials and their irregular thicknesses, but because of the very variable nature of the materials themselves.

One of the most important questions arising in connection with the superficial deposits, especially where they are extensive, is whether it is advisable in the case of earth embankments, to leave the solid rock bottom, and continue the trench in any water-tight layers of the overlying materials. The problem appears to be simply a matter of ascertaining whether the water-tight material (or boulder clay as generally the case in England) lies directly upon solid rock, and is not underlain by water-bearing beds, such as gravel and sand. The fact that a thick mass of boulder clay overlies the reservoir site may often be looked upon, of course, as an advantage in one way, that is, in preventing or lessening the flow of ground water in the underlying materials. But unless thorough preliminary investigations are carried out, it can never be definitely known whether water-bearing beds of gravel and sand may not occur in patches under the clay, and outcrop in the reservoir higher up the valley.

Overlying nearly all solid rock there is soil, subsoil, and loose rock opened out and broken up by weathering and other agencies. These open materials, of course, in dam trenches have to be penetrated, because they are loose, unstable and permeable by water. The principal factors producing broken-up surface or sub-surface materials, in addition to weathering agencies, are surface-creep and landslips. A landslip is generally assumed to take place suddenly; surface-creep is a very slow and gradual process. Landslips are generally visible on the surface, though not always so; surface-creep rarely, if ever, makes any sign on the surface.

Landslips should be avoided in the selection of dam sites, not only because of the extra cost due to penetrating the broken-up material before reaching solid rock beneath, but if there is a shaley rock series, there is a possibility of the landslip moving again after the reservoir is filled, owing to lubrication from the water in the reservoir. The Woodhead dam of the Langdendale reservoirs of the Manchester Water Works is an example of a dam penetrating landslips.

The surface sliding of material often produces in shaley rocks a buckling-up or folding of the rocks in the centre of the valley. But there is a second cause for these folds, which is more serious and this is a general or regional horizontal movement of the whole of the rocks. In cases where the folds die out downwards the movement is attributed by some to general lateral creep, by others to a local movement due to the weight of the hills on either side of the valley squeezing out the beds laterally or horizontally, and resulting in an uplift of the strata in the centre of the valley similar to the uplifting movement in the floors of mines and tunnels. Whatever the explanation may be, the fact remains that such movements have taken place in many districts of the carboniferous rocks in the North of England. There are numerous dam sections showing this buckling-up or wrinkling of the strata in the centres of the valleys, often extending to considerable depths, and producing in the rocks extensive fracturing and faulting, and a general opening out of the beds to the freer percolation of water. In the Derwent Valley these wrinkles are of great depth; and evidence of horizontal sliding is very clear—pieces of shale from trial headings driven hundreds of feet into the hillside being perfectly polished by the movement. Horizontal movements of this appear to die out at certain depths below the surface, though these depths may be considerable. They are apparently resisted by thick masses of rock. Thus the Derwent Valley wrinkles die out downward, when a considerable thickness of massive beds of sandstone is reached, though their effects are continued below generally in the form of faults.

The merits or demerits of faults in dam trenches have been the subject of discussion among water engineers. Some go as far as to say they prefer faults if they can get them in a dam trench, because they serve as water-tight barriers into which the trench can be tied. Opinions on this question seem to depend mainly on the kind of rocks with which one has had experience. The water-tightness of a fault depends entirely upon the material it separates. If the rocks are generally shaley, the fault rock consists for the most part of fine ground-up shale, often of a clayey nature and water-tight. If, on the other hand, the rocks are of hard material—such as sandstone, grit or igenous rocks not decomposed—then the fault rock will generally consist of fragments of these materials, with openings allowing the passage of water.

The natural jointing or rocks below the surface independent of weathering influences is, of course, one of the principal reasons why many trenches have required to be sunk to great depths in the solid rocks, especially where the joints have been widened by earth movements subsequently to their original formation. The natural jointing of rocks extends to enormous depths, though the percolation of ground water through them is confined, as a rule, to the higher measures. The tendency of all jointing obviously is to decrease downwards; the joints becoming farther apart, and the width of the openings diminishing. But it is by no means the rule that a trench sunk or carried far into the hillsides will eventually reach material in which the joints are so fine or so widely spaced, as to prevent the percolation of water. In the Howden dam of the Derwent Valley Water Works, trial headings driven hundreds of feet into the hillside showed no diminution in the jointing of the sandstone beds, in fact, rather the reverse; for at a distance of 500 feet in from the surface horizontally and 250 feet vertically below the surface some joints were as large as 9 in. in width and upwards of 6 ft. in height. These remarkable joints below top-water level necessitated the construction of two long wing-trenches, one on each side of the valley, following the top-water line of the reservoir.

Where there is difficulty in getting water-tight ends to a trench, or where there are water-bearing beds in the trench which out-crop in the reservoir, it is a common practice to divert the line of the main trench roughly at right angles, and proceed up the valley with "wing-trenches" until a water-tight end is met with. The trench is sometimes turned into the hill at the end at right angles to the direction of the wing. Where it is a question of founding in water-tight beds such as shales, with overlying open rocks such as sandstone, the direction of the wing-trenches should be determined, of course, by the dip; and they should run in the line of the steepest rise of the bed. In cases where the dip is up-stream, the wing-trenches should run down stream.

The second method of dealing with water-bearing beds out-cropping in the reservoir is to run out an "arm-trench" up-stream at right angles roughly to the main trench. This arm-trench may have its top and bottom in water-tight strata, and thus the water-bearing beds between are cut off from their outcrop when the trench is filled; or the bottom may be in water-tight strata, and the water-bearing beds partly cut off by the trench; the remainder on the outcrop above being concreted or puddled over, as in the Bottoms reservoir of the Langdendale works. A third method (where, by reason of the geological conditions, no advantage appears to be gained by going up or down stream) is to continue the line of the main trench into the hill in heading until water-tight material is met with, or for such a distance as is considered sufficient to offer resistance to percolation. The width of wing or arm trenches is generally not less than 5 ft. 6 in. or 6 ft., for convenience of working.

Where the trench has been carried laterally into the hill to a considerable distance, and some doubt is felt as to the water-tight nature of the ends, some engineers have left vertical shafts at the ends of the completed headings, with means of approach for inspection during and after the building of the reservoir. This has the great advantage of proving whether the ends are sound, and of locating the leakage if any occurs. The question whether leakage from a full reservoir, either under or around the trench, is serious or not, is one on which opinions differ among engineers of different countries. In America and India, for example, puddle trenches are not carried to such great depths as in Britain. Sometimes the puddle core is altogether omitted, and leakage is expected; systems of drains being provided for carrying away the percolating water. The general opinion in these countries seems to be that it is waste of money to spend large sums in order to stop small leakages of water. So long as the leakage does not affect the stability of the embankment, or wash away the puddle in a clay puddle trench, there is something to be said of this attitude; but the difficulty when dealing with an imperfect piece of trench during construction always lies in deciding what is likely to be the amount of leakage when the full pressure of the reservoir comes upon the foundations.

The catastrophes that occurred in the early days of reservoir construction in England, though not affecting so much the question of selecting sites, have led British water engineers to aim at perfect water-tightness of the trench-work; and the general practice is, if possible, to carry the work laterally and downwards into retentive material. It has not always been possible to secure these ideal conditions, the extra cost involved in obtaining them having sometimes rendered such a course prohibitive; and the result has been considerable leakage—sometimes unforseen, sometimes expected, or even created by leading the water up from the foundations in vertical pipes. The leakage is allowed to escape into the river below the dam as compensation water, and care is taken to protect the puddle by means of concrete. This practice was adopted with the Yarrow dam of the Liverpool (Rivington) Water Works, where a strong spring was met with about 150 ft. below the surface; and since that time in many other trenches in England.

Where the area of the leakage channels is small, or where the frictional resistance of the water-passages is sufficient to prevent high velocities, the tendency is for silting to take place, and for the leakage eventually to cease. This has occurred in innumerable instances in America, India, Britain and elsewhere. Grouting, or forcing cement grout under pressure, is sometimes recommended as a means of stopping leakage from a reservoir through jointed or fissured rocks. While this may reduce the amount of leakage, it is, in the author's opinion, scarcely ever likely to be successful in stopping the flow, except by an extraordinary chance. Reservoirs that have leaked through open joints have been successfully treated by adding wing or arm trenches, or by subsequent covering of the water-bearing outcrop with a layer of either puddle or concrete.

Igenous rocks form the foundation of numerous dams on the Continent and of a few in Britain. The main characteristics of crystalline rocks generally is existence of numerous joints, often extending to great depths. These are generally vertical; but in certain rocks, such as granites, they are frequently accompanied by horizontal joints. These joints act as water channels and generally contain deep-seated percolating water, which is transmitted for considerable distances. These water-bearing joints in the igneous rocks render the trench work in such material exceedingly uncertain. Another very uncertain factor, more especially in the granites, is the depth of decomposed material.

The older rocks generally have been subjected to long-continued compressive forces of such intensity that the material has become greatly consolidated and the joints, faults and fissures are tightly closed at shallow depths. The result, as regards reservoir trenches, is that a water-tight foundation is found, as a rule, near the surface, and dam sites on these older rocks are more economical, as a general rule, than those on the later deposits.

Investigations of Flow in Brick-Lined Conduits

In a paper read before the Western Society of American Engineers by Mr. John Ericson, city engineer of Chicago, the conclusion was drawn that for brick-lined conduits a value of n in Kutter's formula of 0.0130 is readily attainable. This is a coefficient due to roughness, and is applicable to tunnels or sewers of ordinary sizes and velocities of flow, lined with sewer-brick laid in cement mortar, if the brick is properly selected and not too warped or uneven, laid in a workmanlike manner and true to line, not disturbed by blasting, and the mortar joints scraped off flush with the brick.

Under certain circumstances, especially if there has been any disturbance whatever of the brick on account of blasting, it will be found advisable and profitable to have, in addition, the entire interior surface of brick conduits washed with neat cement, the strokes of the brush applying the wash to be always along the geometrical axis of the conduit. By this method a coefficient of roughness, n, considerably smaller than 0.0130 should be obtained in well-constructed tunnels of the sewer brick-lined class.

In relation to blasting in the excavation of trenches for brick-lined conduits, Mr. Ericson pointed out that if the lining is thereby at all disturbed, whether such disturbance is especially noticeable or not, it will have the effect of increasing the resistance to flow, and consequently decreases the capacity of such a tunnel. The jarring of the brickwork undoubtedly disturbs the mortar joints more or less, so that the bond with the brick will be broken. Slight projections and irregularities will be caused by this shaking of the brickwork, and, irrespective of any visible disturbance or distortion of the same, resistances to the flow of water are created.

A brick tunnel in rock should not be lined until after the completion of the entire excavation, or at least the brick lining should be kept far enough back of the face, and be so protected as to be unaffected by the blasting.

In an earth tunnel, blasting should preferably not be permitted at all, and if anywhere found to be necessary, care should be taken to protect the brickwork from the effect of such blasting, and to remedy any defects in the brickwork that, upon close inspection, may be discovered.

Occurrence of Asphalt

Asphalt in nature occurs in two types, so far at least as concerns workable deposits. The first type embraces the occurrence of beds of practically pure, separated-out bitumen, such as occur in Trinidad and about the Red Sea. The second type embraces occurrences of asphalt bound up in limestone or in sandstone, as in the Simmer pits in Hannover, Vorwhole in Brunswick, Travers in Switzerland, Ragusa, Sicily, and Volga district in Russia, etc. Asphalt, representing perhaps a third type, occurs in commercial quantities in petroleum and oil shale deposits and exudations therefrom. The last named, as in California and Cuba, grades into the pure asphalt type of deposit characteristic of Trinidad. The oil shale deposits, depending upon the amount of asphaltic base, grade into the Travers type of deposit.

Immense asphalt beds have been discovered [illegible] miles northeast of Fort McMurray, Alberta.

Some Details of Quebec Bridge Proposals

Investigation of the Numerous Proposals of the Bidders—A Competition of Erection Methods—Thirty-five Distinct Proposals

An investigation of the various designs submitted by the four bidders for the contract of the Quebec Bridge over the St. Lawrence river brings out a number of important points dealing with problems of erection in such structures of exceptional dimensions. From the six modifications of its own general design, together with the alternative designs, allowed by the Board of Engineers, there resulted 35 separate and distinct proposals. These were enumerated and dealt upon briefly in a previous issue of the Contract Record (May 3, 1911) and the diagrams shown herewith belong to that article, but are reproduced in connection with the following detailed examination of the various designs appearing in the Engineering News, of New York.

Maschinenfabrik Augsburg-Nuernberg A. G.; Board's Design

In two forms of the Board's design, the entire bridge is to be erected by cantilevering. Erection would start from the main piers, both the anchor and the cantilever arms being erected without falsework. To insure stability the anchor arm is temporarily supported at panel-point AL10 by a steel temporary bent resting on concrete footings.

Before erecting the permanent truss members, a temporary framework spanning from the main pier to the temporary bent is erected by derricks. The floor members of the bridge being erected on this framework, the erecting cranes would be built on this floor.

It is proposed to erect the bridge by double-jib travelling cranes, two on each arm, having cross travel on a tower or trestle arranged to run longitudinally along the floor of the bridge. All movements are to be by electric power. Each crane has a lifting capacity of 200,000 lbs. Erection can therefore proceed simultaneously at four different points. The rails on which the crane trestles are to run are to be laid on the regular stringers, which for this service could be shifted towards the main trusses of the bridge. The expense of providing four cranes on each side of the river was considered warranted on account of the amount of time saved for the completion of the work. Erection is to proceed on both sides of the river at the same time.

The cantilever-arm travelling crane will be built first and the work of erection will commence at panel A13 to C13 (panel-point 14 is the main post), including the erection of the temporary supporting bent and its adjoining members. While this work is progressing the anchor-arm crane will be erected in panel A11—A10 and work started on the erection of the first anchor-arm triangle L14—U12—L10. The diagonal members AU12—AL14 are temporarily strengthened, because they become compression members for a time. An auxiliary member is to be inserted between the points AM13—CM13 to serve for regulating the system during the first cantilevering out.

While the bridge construction below the floor is being cantilevered out panel by panel, assisted by auxiliary members, some of which are adjustable, the posts and upper-chord members between the two compression diagonals are put in place, by means of the crane operating from central position.

When cantilevering out the cantilever-arm, the intermediate chord points M3 and M1, as well as the upper chord points U2 and U0, are connected to the floor beams of the bridge by special stiffeners in order to increase the lateral rigidity of the trusses.

Cantilever Erection of Suspended Span

In cantilevering out the suspended span, the first two panels are erected in the same manner as the last panels of the cantilever arm by using the same traveling cranes. By lowering the working platforms both the traveling cranes are then changed into upper chord cranes, thus decreasing the weight and consequently the stress in the members of the bridge. These upper chord cranes then work in the usual manner, panel by panel, up to the centre of the bridge.

The operation of connecting up at the centre of the suspended span is facilitated by means of strong adjusting devices connected with the top and bottom chords at the end of the cantilever arms.

Suspended Span Floated In

This scheme necessitates the erection of the suspended span on high steel falsework, this falsework being supported in turn on large pontoons, the whole being finally towed into position. The height of the falsework is such that at low tide the suspended span is about 2 ft. higher than corresponding points on the cantilever arms. The hanger or rocker U0—L0 is composed of wire cables, and thus is enabled to buckle under compression. On this account the connection between the suspended span and the cantilever arm (by means of the pin at L0) can be made at any time and the suspended span still remain on the falsework and move up and down with the tide. The connection need not be made simultaneously at all four corners as would be the case if these members were composed of rigid eyebars.

The steel falsework is first erected on concrete pedestals, situated in some bay or cove adjacent to the bridge site. When the span has been completely erected over the falsework, scows are floated under the falsework between the piers, and the structure transferred to the scows by first partially filling the scows with water and, when they are in place under the bearings provided, pumping the water out. Four scows each 275 ft. x 46 ft. are proposed for this operation.

When the suspended span has been towed to the site and placed in position, water is again let into the scows and the entire scaffolding is lowered to such an extent as to enable its being freely floated out from under the bridge.

Maschinenfabrik Augsburg-Nuernberg; Bidder's Design

The design proposed has a single-intersection web-system, similar to the Board's design, but the web triangles are considerably larger. The lengths of the several arms of the bridge are samewhat different,

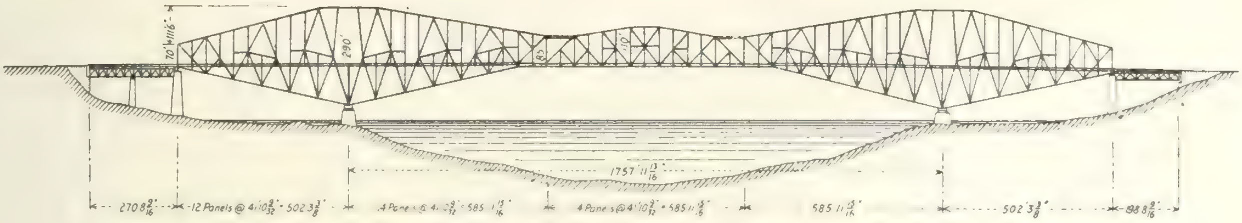

70' 11 1/16"
290'
85'
110'
1757' 11 13/16"
270' 8 9/16"
12 Panels @ 41'10 9/32" = 502' 3 3/8"
14 Panels @ 41'10 9/32" = 585' 11 15/16"
14 Panels @ 41'10 9/32" = 585' 11 15/16"
585' 11 15/16"
502' 3 3/8"
198' 8 9/16"

FIG 1. OFFICIAL DESIGN V, BOARD OF ENGINEERS

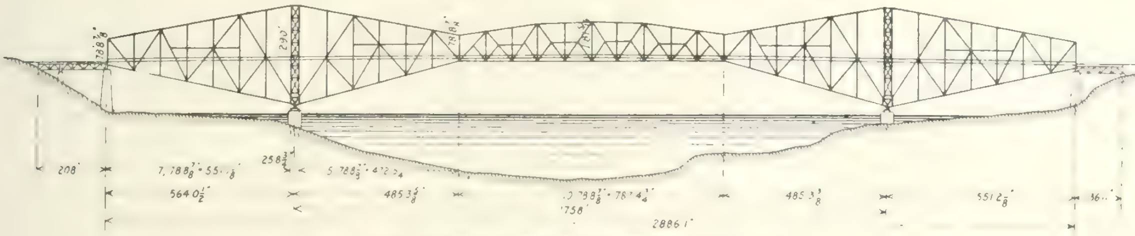


FIG 2. DESIGN OF MASCHINENFABRIK AUGSBURG-NUERNBERG

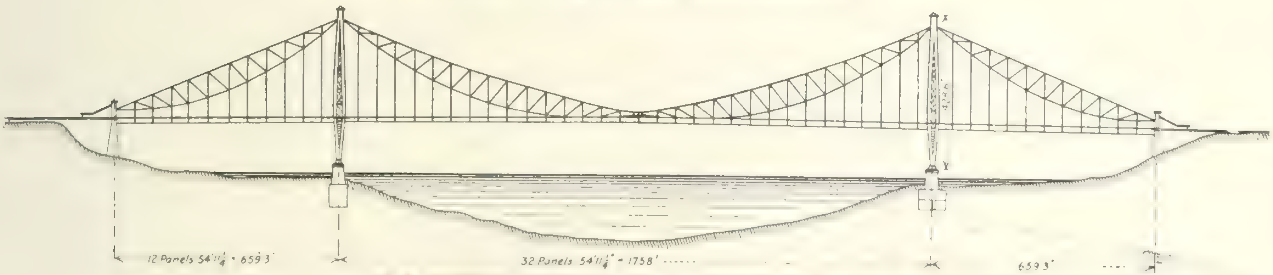


FIG 3. SUSPENSION DESIGN (LINDENTHAL) OF PENNSYLVANIA STEEL CO.

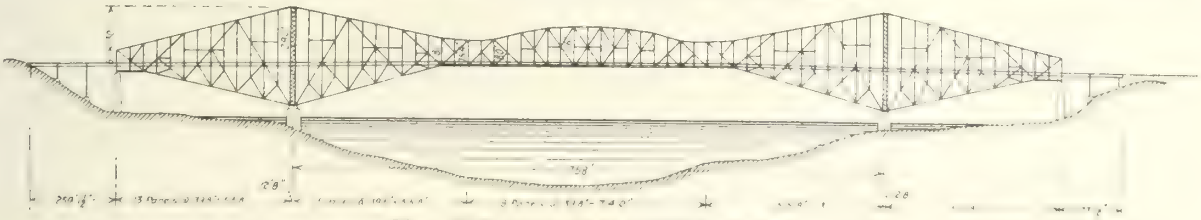


FIG 4. DESIGN M-N OF THE ST. LAWRENCE BRIDGE CO.

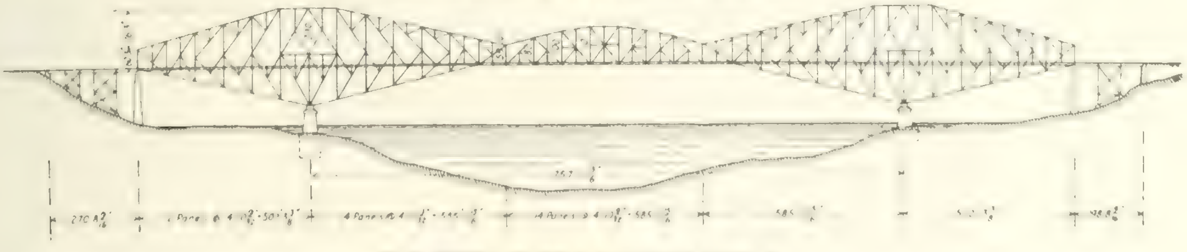


FIG 5. DESIGN A-B-X OF THE ST. LAWRENCE BRIDGE CO.

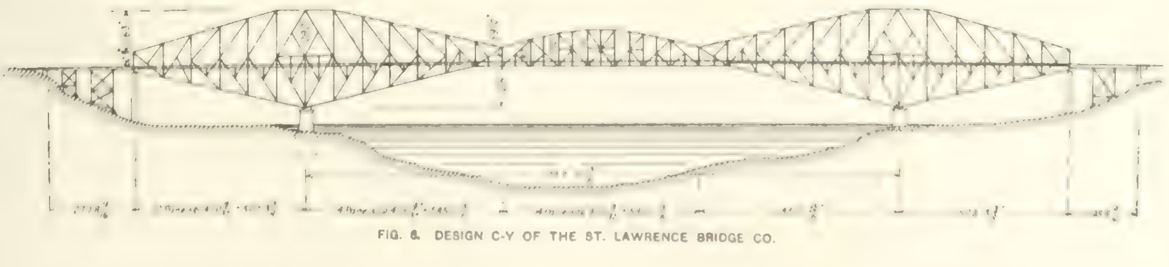


FIG. 6. DESIGN C-Y OF THE ST. LAWRENCE BRIDGE CO.

but the main span is unchanged. The design was made with the intention of floating in the suspended span.

On account of the long panels the floorbeams are very heavy. To facilitate manufacture and erection they are built as box-girders, the two webs being shipped separately and connected after erection by a cover plate. In order to limit as much as possible the use of secondary members and also to facilitate certain parts of the erection, eyebars are used to only small extent in the design. The top chords and main tension members are built-up riveted members. Each main pier is provided with a special pedestal of cast steel providing a central transmission of load on the pier and permitting of free deflection of the bridge. The pedestals are set on riveted steel grillages sunk into the masonry piers to provide a uniform distribution of load. The centre span is suspended from the cantilever arms by means of cables, just as proposed for the Board's design.

Fig. 2 illustrates the general method proposed, Both arms are to be cantilevered out from the main piers and the stability of the work ensured by temporary supports under the anchor arm. In this case, however, travelling cranes are operated on the top chords, two on each anchor arm and two on each cantilever arm at the same time. These cranes have 82-ft. booms and are arranged so as to be able to be moved crosswise on a crane trestle which itself can move longitudinally on the upper chords of the bridge. All cranes as well as the crane trestles are operated by means of electrically-driven winches. Each of the cranes has a maximum lifting capacity of 120,000 lbs. at the extreme end of its boom and a capacity of 200,000 lbs. within a closer area.

The erection of the main bridge starts with the laying down of the shoes. These shoes are designed to be floated in place and to be set on previously prepared bearings as the tide goes down. While the shoe is being put in place, the temporary falsework is raised and posts erected along with the sway bracing of the bridge. The crane trestle for the anchor arm and its two traveling cranes are placed on top of the group of posts, which, with its permanent and temporary bracing acts as a tower. After the cranes have erected the missing parts of the main trusses and the flooring between these posts, the crane trestle is brought to its second position in order to make way for the cantilever arm, and they then build panel by panel the main trusses, bracing and floor of the bridge up to the anchor pier on one side and the end of the cantilever arm on the other, employing during the operation such temporary members as are required.

All material for erection is lifted on to the bridge from scows. The hoisting is done by a crane traveling on the floor of the bridge, having a capacity of 200,000 lbs. This crane can then transport the material to any point on the bridge where it is required. The runway tracks of this crane always project beyond the last panel erected in order to serve the overhead cranes to the best advantage.

The suspended span would be erected on high falsework as for the Board's design. The span is supported at each panel-point, by a truss on the falsework, the whole carried on four pontoons each 295 feet long and 49 feet 3 inches wide. When the suspended span has been completely erected on the floating scaffolding, it is towed to the bridge site. After its arrival there it is accurately held in position by means of wire cables and winches placed on the banks of the river.

To facilitate the operation of coupling up the suspended span to the cantilever, as well as to avoid blocking traffic on the river any longer than absolutely necessary, a special supporting and lifting device is provided at the ends of the cantilever arm. This temporary support is made of cross beams suspended from the end of posts of the cantilever arms by means of hinged tension members. At high tide these supports, previously swung back in a slanting position towards the piers to allow the suspended span to be floated into its closely approximate final position, are allowed to swing back to their normal position, the cross beams passing under the ends of the bottom chord of the suspended span at its four corners. As the tide goes out the bridge comes to rest on these temporary supports and the falsework floats clear. The suspended span is then adjusted to its final position by means of 16 hydraulic jacks located on the upper chord, each having a capacity of 1,322,000 lbs. and a lift of about 3 feet, operating a frame connected to the above mentioned cross beams. A safety device holds the crane beams in place step by step as it is raised, thus providing against any accident. When the lifting has been completed the wire hangers are fitted to their bearings and the suspended span, previously lifted a little too high, is lowered to its permanent position.

British Empire Bridge Company, Limited

The British Empire Bridge Company tendered only on the Board's design, but proposed three different schemes of erection of the suspended span: (a) cantilevering out; (b) floating in on high falsework; and (c) floating in a special truss to be used as stage or falsework upon which the suspended span proper will be afterwards erected.

The method of erection of the cantilever and anchor arm is naturally the same for all three cases. The work is started by first building a high steel tower, two legs of which will rest on the main pier, while the other two are on special concrete pedestals. These towers will be slightly higher than the top chords of the bridge. On top of the tower will be erected the two travellers to be used for the erection of the bridge itself, one to be used on the top chord of the anchor arm and the other on the top chord of the cantilever arm.

A portion of the material is to be delivered by water and a portion by rail. The material delivered by water will be erected by the travellers standing on the top of the tower and the erection will be carried forward by water as far as convenient. Afterwards the material will be delivered by rail. For this purpose a trestle will be erected between the land and the portion of the steelwork already erected.

To obtain stability during erection a temporary concrete pier will be built under panel point AL10. This pier will have eyebars built into it, to which the truss may be anchored. During erection the member AU12—AL10 will be reinforced so as to act as a compression member. After the tarvellers have done all the erecting possible from their position on the towers, they are transferred to special tracks on the top chords from which position they proceed with the erection, panel by panel. As both the cantilever and anchor arms are erected as cantilevers the stresses during erection are the same as in the completed bridge, and all joints will be riveted up complete as the erection proceeds.

Suspended Span Cantilever

When the cantilever arms are completed the same top-chord travelers can proceed withe the erection of the suspended span to junction at the centre. The adjustment at this point is controlled by adjustable members between ths suspended span and cantilever arm.

Suspended Span Floated In

Floating the suspended span into place permits of work on this part of the structure to be pushed ahead at the same time as the other parts of the bridge. In the case of the high floating erection, the falsework consists of a long truss supported on two towers, the foot of each tower being carried on a pontoon 225 feet long, 45 feet wide and 30 feet deep. The panel-points of the supporting falsework correspond to the panel-points of the suspende dspan, permitting the use of eyebars in the bottom chord of this span. The falsework is not transferred to the pontoons until the suspended span has been completed and everything is ready for towing to the site. It is built high enough so that at extreme low tide there is no chance of the suspended span putting any load on the supporting cables attached to the cantilever arm, during the operation of coupling up. The falsework is securely attached to the pontoons, but the span itself is supported on special bearings, preventing any side or lateral movement but leaving the falsework free to descend below the span when required. This prevents any chance of the weight of the falsework and pontoons being taken on the structure. The pontoons are fitted with pumps and valves so that the level of the steelwork can be controlled at all times. The pontoons are held in position under the bridge by the tugs supplemented by anchors and moorings attached to winches on the adjacent shores. Navigation on the river would have to be stopped during the operation of floating in.

Stage Erection

The third scheme for erecting the suspended span proposed by this company is by means of a special temporary span which is floated in and suspended between the two arms of the cantilever arms, and upon which the permanent span is finally erected.

In general this supporting stage consists of two main trusses spaced 64 feet centre to centre, each main truss being made up of two independent trusses spaced 9 feet, centre to centre, the two being securely braced together so that they would act as a single truss. The construction of the stage is made as light as possible, wire cables being used for all tension members, the compression members being of nickel-steel. The weight of each double truss is about 510 tons. The spacing of the vertical posts and diagonal bracing is arranged so as to give free access to joints and connections of the permanent span to facilitate driving of pins, riveting, etc., and the top and bottom chord are either above or below the corresponding chords of the suspended span. The floor of the stage is as shallow as possible, so as not to interfere with the clear headway required for navigation. The floor-beams are attached to the side trusses by a knuckle bearing between the trusses, thus ensuring equal distribution of load.

In erecting the stage it is intended that each double truss will be hoisted in place separately by means of the top-chord travellers and slung from the end of the cantilever arms. To ensure stability during hoisting and until the floor system and bracing was put in place the particular form of truss used was decided upon. Until the wind bracing is put in, the trusses are guyed to the ends of the travellers overhanging from the end of the cantilever arms.

The suspended span will be built on the stage floor outside the temporary girders. When this truss is completed it will be hung in its proper place, being attached, however, to the temporary truss to prevent lateral motion or stress from wind. The floor and bracing will then be put in place, the dead load of which will be carried by the permanent structure, the temporary staging being required to carry only the dead load of two main trusses. Special adjusting devices are placed under the panel points of the suspended-span trusses during construction, to correct whatever deflection may take place in the temporary staging under the constantly increased load.

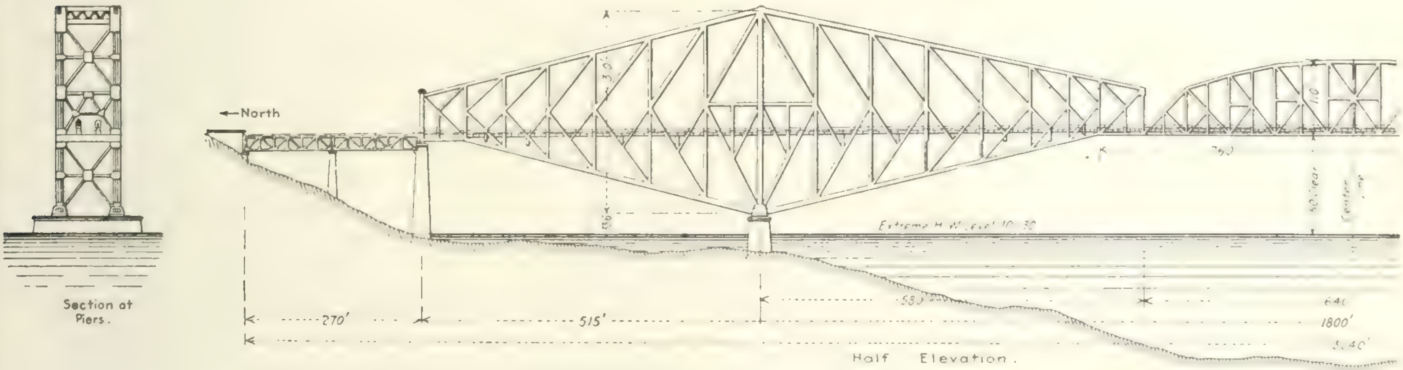


FIG. 7. ACCEPTED DESIGN OF ST. LAWRENCE BRIDGE CO.

Fig 7

Pennsylvania Steel Company

The Pennsylvannia Steel Company proposed three different schemes of erection on the Board's design in addition to submitting a tender for a suspension bridge based on a design by Mr. Gustav Lindenthal. The different schemes of erection of the cantilever designs differ only in the manner of the erection of the suspended span, viz., by cantilevering out, by floating on high falsework, and by floating on low falsework and hoisting into place. The method of erecting the cantilever and anchor arms is naturally the same in all cases.

Preparatory work in the nature of storage yards, crane, runways, loading, and unloading, gantrys, etc., is fully provided for by the proposal. At the north side, where erection would start, there is a heavy timber elevator to deliver the bridge material from the upper to the lower level, as the company proposes to bring all material in by rail. On the lower level a yard served by a 100-ton gantry is laid out for storing and handling material to be used on the north side. The material for the south half of the bridge will be brought to the north side and carried by the north gantry crane, assisted by a special derrick car, to a barge slip, whence the steel is transferred across the river on barges. On the south shore it is received by a gantry equipment similar to that on the north shore. All machinery is operated by electric power. An electric winch helps handle the scows and a motor operates the material trucks on the tracks from the gantry yard to the slip.

The first step in the erection will be the raising of a steel tower, 46 x 50 ft. and 248½ feet high, behind the main pier. This tower will be equipped with four booms of 90 tons capacity operating from the corners at the top. The booms are fed either directly from the gantry yard or by a special track leading from the yard.

The derricks on the tower erect the falsework between the pier and AL10, after which the permanent bridge steel, including the shoe, bottom chords, laterals, etc., up to the bridge floor is put in place. With a suitable number of additional stringers placed on the floor, the upper part of the tower is disconnected from the lower part at the level of the floor. The top is then skidded along the bridge floor until it is in a position directly over the main pier. The lower part of the tower is then taken down and re-erected on top of the section already in place. On the top of this reconstructed tower the booms are again erected, the hoisting engines remaining on a platform on the tower at the floor level.

The tower in this second position erects the permanent members of the truss that can be handled within the swing of the booms, including the top-chord section between the main posts and the two diagonals completing the triangle AL14—AU12—AL10. Under panel point AL10 a temporary steel bent is placed to support this triangle, the bent being imbedded in concrete to above high-water mark, as a protection against ice, etc. As the work of erection progresses from this point, the cantilever and anchor arms are so balanced that the centre of gravity of the completed work always lies between the main pier and the temporary tower at AL10. This tower being securely anchored down is also capable of acting as an anchorage, thus affording an extra factor of safety.

When the work has proceeded this far, the top section of the erecting tower is hung up from the top chords by floorbeams in temporary positions, and the lower part of the tower is taken down. The tower booms then erect the top chord travellers, one for the anchor arm and one for the cantilever arm, taking a large part of the material from the bottom sections of the tower.

These travellers have booms 90 feet long and a lifting capacity of 100 tons. In addition they are equipped with two 20-ton derricks with booms 80 feet long, located 15 feet inside the centre line of the bridge trusses. The 20-ton derricks have double booms for convenience in driving pins. The travellers slide forward from panel point to panel point, on runway box girders. They have no wheels, but are fitted with sliding shoes, except in the cantilevering of the suspended span, when rollers are placed under these shoes. This is done as an added factor of safety to prevent any tendency of the traveller to slide forward, or to get out of hand when unclamped and moving.

Material is supplied to the top travellers by derricks situated on the bridge floor. One 100-ton derrick is located over the main pier and one for lighter material at panel AL10, both commanding the gantry yard below. Where possible, material from the gantry yard is picked up direct by the top travellers.

Suspended Span Cantilevers.—After the main anchorages are in position the traveller on the cantilever arm continues ahead on the suspended span until the whole bridge is completed. Adjustable members are introduced at the end of the cantilever arm, in order that the work may be coupled up at the centre. The travellers are adjusted to work on a horizontal instead of inclined chord by means of extra steel members and the rollers mentioned above.

High Floating Erection.—The suspended span is erected on high steel falsework, the proposed site for this erection being at Victoria Cove, about half a mile below the bridge site. Material for the suspended span is taken from the north gantry yard and transported by water as required. The falsework is erected by gin-poles assisted by a derrick on a scow. The span is erected on the falsework by an inside steel tower traveller having two heavy derricks in front and a light one at the rear. This tower is high enough so that brackets on the top floor level overhang the top chord of the span, and from them the truss members are temporarily hung. When the span is fully assembled and the traveller taken down, the trusses connecting the two falsework towers are lowered from their top position to the bottom of the tower, where they are connected to these towers, thus acting as reinforcement to the pontoons and holding them in their relative positions.

The pontoons are floated under the falsework towers in between the temporary concrete piers upon which the falsework is erected. At high tide the load of the falsework and suspended span is transferred to the pontoons which are then towed to the site. Two pontoons are used. Each is 252 feet by 75 feet, and 13 feet deep.

Low Floating Erection.—Under this scheme, the suspended span is erected in the same manner as for the high floating scheme except that the span is erected on low timber falsework. When the span has been completely assembled the falsework is removed, allowing the span to rest on four concrete piers, in which position it is finally riveted up. At the proper time six scows, three at each end, are floated in, and when the tide rises the span is transferred to these scows and towed into position. From this position it is jacked up into its final position.

The wire suspenders attached to the suspended span the held up in place by wooden falsework, the suspenders being sufficiently slack so that any wave motion will not tend to pick up any corner of the span before all four corners are attached, and the entire weight taken simultaneously by the lifting jack.

The cast collars are supported on a heavy frame made of girders, which are in turn attached to a chain of lifting plates. These plates are 27 inches wide and are full of bolt holes, uniformly spaced, so that they can be thoroughly bolted together. The plates lap past each other so that each plate can also be readily removed as the span is gradually lifted. Each lifting plate has 10-in. pin holes every three feet.

On the top of the end of the cantilever arm is a steel box which has a 2,000-ton jack inside of it, and just above it is another steel box similar in design. The lifting plates pass through both of these boxes and at the start of the lifting operations the lifting plate carrying the suspended span is hung from the upper box by means of a 10-in. pin passing through the box and plate. The jack in the lower box is operated by an electrically-driven pump and is designed for a working pressure of 11,000 lbs. per square inch with an effective stroke of 3 feet and a speed of 2 ins. per minute. When everything is ready the jack is operated and the load raised 3 feet, or until the pin through the lower box and the lifting plates can be driven and the upper pin withdrawn. The upper box is then lowered until its pin hole comes opposite the next lowest in hole in the lifting plate. This pin is then driven and the lower pin withdrawn, the jacks again operated, thus completing a cycle. As sections of the lifting plates are released, they are disconnected and by means of the traveller are lifted out of the way. The lifting operation proceeds at all four corners of the suspended span simultaneously. When the span is fully raised the final pins can be driven as the pin holes in the cast collars are not used during the raising.

A safety device is provided to safeguard the raising operations. It consists of four screws at the four corners of the lower box, driven by an electric motor operating through equalizing gears. These screws are always bearing against the upper box, and as they are capable of sustaining the whole load, the temporary failure of the lifting apparatus would have no serious result. These screws can also be used for quickly lowering the upper box after each operation.

After the load of the suspended span has been transferred to the lifting jacks the scows can be released and all lines and anchors cleared from the river. It is estimated that the span can be lifted and connected in two working days. Many of the special appliances proposed by this firm in connection with the erecting of this bridge have been patented. The scows used in this scheme are each 257 feet by 38 feet and 10½ feet deep.

The St. Lawrence Bridge Company

The St. Lawrence Bridge Company, in addition to tendering on each of the Board's designs, submitted seven different designs, as follows:

Design A.—This corresponds to the Board's design with respect to panel lengths, height over main pier, profile of bottom chords, and floor system. It has an anchor arm of twelve panels and a suspended span designed for floating erection, corresponding to Design V. of the Board. The Board's design has been departed from in respect to the type of web system, the substitution of built-up tension riveted members for eyebars, and as regards the outline of the top chord of the cantilever arm and the suspended span. There are also various changes in the design of many of the members.

Design B.—This is the same as Design A, with the exception that carbon steel instead of nickel-steel is used for the vertical posts in the cantilever arm, three panels away from the centre pier, as well as for all members in the anchor arm. The details of member and type of web system remains unchanged.

Design C.—This design is identical with Design A, except that nickel-steel eyebars are used throughout, instead of built-up riveted tension members.

Design M.—This design retains the single intersection of the Board's design, and follows very closely the general features of the design submitted by Maschinenfabrik Augsburg-Nuernberg. The anchor and cantilever span arms are each 522 feet long with a suspended span of 714 feet. In this design nickel-steel is used throughout. The details of the main members have been somewhat changed from those prepared by the Board. Pin bearings are employed throughout for all abutting joints of compression members.

Design N.—This design is identical in outline with Design M, the only difference being that carbon steel is substituted for nickel-steel in a number of the members. This change was made with the idea of effecting a slight economy in design.

Design X.—Design X is similar in outline and general details to Design A, but is intended to accommodate railway traffic only, the tramway and highway roadways being omitted. A 4-ft. walk is allowed for on each side for the use of inspectors, etc. Carbon steel is used for the anchor arms, members over the main piers, and for the vertical posts of the cantilever arm for three panels from the pier. Carbon steel is also used for the centre posts of the suspended span. This design is shown in Fig. 7.

Design Y.—This corresponds to Design X as Design C compares with Design A. Here railway traffic only is provided for and nickel-steel eyebars are used instead of riveted built-up tension members.

Scheme of Erection.—Several different schemes of erection are proposed, for the suspended span as well as the cantilevers. These schemes are in the nature of studies, the final choice being subject to the design upon which the contract might be awarded, and to approval by the Board. They include the following elements:

(a) Erection of the anchor arm on steel falsework before starting the erection of the cantilever arm. In this scheme the anchor arm will be assembled and riveted up complete before moving ahead. An inside traveler is used and is operated from the floor level (see Fig. 6). This scheme can be applied to both the Board's and the contractor's designs.

(b) Erection of the anchor arm and the cantilever arm concurrently. The first step in the erection is the construction of a high tower on piers between panel points AL12 and AL14. This tower has overhanging arms from which the trusses on either side can be reached. From this tower the anchor arm is erected up to AL10, under which point a temporary masonry pier is built, which acts both as a supporting pier and an anchorage. After the floor has been put in place the tower is taken apart at the floor level, the upper part being used as an inside traveller with which the remainder of the anchor arm is erected. The erection of the anchor arm is always sufficiently in advance of the cantilever arm to ensure that the centre of gravity is always between AL10 and the main pier. A falsework trestle for the handling of material connects the shore with the work under construction. This scheme of erection can apply either to the Board's design or the alternative designs.

(c) Erection of the cantilever arm by inside traveler, similar to that used for the erection of the anchor arm. In the case of erection scheme (a) the traveler used for the anchor arm is moved ahead on the cantilever arm and the erection proceeds, panel by panel, until this part of the bridge is entirely completed. In the case of erection scheme (b) the traveler for the cantilever arm is erected by the traveler used for the erection of the anchor arm when the erection of this arm has proceeded past panel point AL10, thus ensuring stability for the further progress of the work. From this point and to the end of the cantilever arm, the erection of schemes (b) and (c) are exactly similar.

(d) Erection of the cantilever arm with a top-chord traveler. This traveler is erected by the inside traveler of the anchor arm. This scheme of erection is intended to apply to the Board's design only.

(e) Erection of the suspended span by cantilevering. This erection is done with a small top traveler in practically the same manner as is proposed by the other bidders. This scheme of erection applies only to Designs I. and IV. of the Board.

(f) Suspended span floated in on high falsework. The falsework for this scheme of erection is constructed on concrete piers and is located on the shore directly at the bridge site. The suspended span is laid down at right angles to the bridge proper and one end is hard up against the anchor arm at almost a point corresponding to AL10. A traveling crane takes the material, both for the falsework and the suspended span, from the cars on the bridge and carries it to whatever point it is required. Eight pontoons 120 feet by 36 feet by 12 feet deep are used. At high tide the falsework is lifted off the piers and towed into position.

(g) Suspended span by floated in on low falsework. The erection of the suspended span in this case is carried out as in the preceding, except that the span is erected directly on the piers. For floating, six pontoons are required, each 238 ft. by 38 ft. by 10 ft. deep. After being towed into place the suspended span is lifted into place by means of hydraulic jacks and wedges operated by power. Both schemes (f) and (g) can be employed for either the Board's or the contractor's designs.

Accepted Design

Design X, as is shown in Fig. 7, is the one which was finally approved and contracted for. The top chord and other tension members will be built up instead of I-bar members. The channel span is 1,800 feet, while the suspended span is 64 feet in length. The design calls for members in the anchor arm and those resting upon the main pier, as well as the entire floor system, to be of carbon steel, while the cantilever arms and suspended span are to be of nickel steel. The anchor arms are 515 feet in length, which, in addition to the channel span, makes in all a length of 3,228 feet.

A progress report dealing with the concreting and pneumatic work will appear in an early issue of the Contract Record.

The Pressure of Cement

The pressure of loose cement against bin walls is a very indeterminate quantity according to the paper on "Cement Stock Houses," recently presented to the Western Society of Engineers by Mr. Josiah Gibson. Mr. Gibson's observations are based on data acquired in the construction of a number of cement stock houses for the Universal Portland Cement Co. Portland cement when it comes from the mill is a loose, dry powder weighing about 95 lbs. per cu. ft. When dropped into the bins it becomes very freely charged with air and stands up with a level surface, like a liquid. After standing a few days its weight causes it to settle into a more compact mass from which practically all of the air has been expelled. Unfortunately its properties of internal friction are not constant and it is impossible to predict the degree of its angle of slope. When the cement is drawn from the bottom of the bin, sections of the storage space may be emptied leaving the remainder standing with almost perpendicular sides which, without warning, will cave in against the bin walls.

In one of the earlier bins to be built a series of experiments were made whereby it was decided that it would be safe ta assume the cement to be a liquid of 10 lbs. per cu. ft. weight. It was soon found, however, that there was an excess deflection of the walls so designed and the assumption was increased to 20 lbs. per cu. ft. Later experiments were made by interposing some plank backed I-beams across an opening in the bin and computing the pressure from the deflection of those beams. This experiment showed that a hydraulic pressure of 20 lbs. per cu. ft. would be safe.

In the discussion of the paper this value was objected to as being too small, first, because the experiments did not care for the arching action of the cement and second, because the shock of the falling cement, noted above, was not considered. It was generally thought that a somewhat higher assumption should be made.

A New Concrete Pavement

A distinctly new type of pavement, consisting of an ordinary properly constructed concrete base and a thin wearing surface of bitumen and sand, has been developed and extensively used by the city engineer at Ann Arbor, Mich. This pavement has been laid on the principal streets there where it has been subjected, during the past two years, to all conditions of traffic of a city of 15,000.

The materials and equipment necessary are to be found or easily obtained in all localities and such a pavement may be constructed at a very much less cost than for brick, bitulithic, wood block or the various types of asphalt, and may be considered as suitable in all places where the above would be proper.

Based upon the results obtained at Ann Arbor this pavement is to be considered especially well adapted for use on country roads and highways and upon fairly well traveled city streets.

A new warehouse is being erected for the Gowans Kent Western Company, Limited, in Winnipeg, which is said to be the largest and highest building of its kind built entirely of concrete in western Canada. It is 135 feet high, consisting of 8 storeys and has a ground area of 52 feet by 160 feet. The construction throughout will be of cement with metal window frames fitted with wire glass, the idea being a thoroughly fireproof structure. The foundations, stairways, floors and walls will all be poured concrete. The floors are designed to carry 400,000 pounds per square foot. The cantilever system used in the construction is of 26 feet span, while the footings upon which this cantileverage is carried are 52 feet by 10 feet by 5 feet deep. The Turner system of construction is being used throughout.

The Bank of Montreal, Winnipeg

Work on the Bank of Montreal building, Winnipeg, has reached a state of development where even the lay observer may get a good idea of what the complete structure will be. The site chosen for this building is probably the most attractive in the city, and lends itself peculiarly to the carryng out of an impressive architectural effect. On the east side of Main street at the junction of Portage avenue, it faces directly on the avenue that is now the principal retail thoroughfare, and along which the business of the city seems destined to extend.

The architects, McKim, Mead and White of New York, have taken full advantage of this location, and of the peculiar shape of the lot on which the building is situated. Portage avenue east is a comparatively narrow thoroughfare, and approaches Main street from the southeast at a slight acute angle. In consequence of this the bank has been built to conform with the rear line of the lot, and being square, there is a considerable piece of the point of the lot which is not being built upon. This the bank management proposes to turn over to the city for a monument or fountain space. Such an improvement will greatly enhance the appearance of the bank property, and the street as a whole.

But the bank building itself will be the greatest ornament. Of solid Vermont granite it is the most massive structure at present in the city. The main entry when completed will be magnificent, for the front of the building is supported by six huge columns that rise 50 feet from the street level. These are 4 feet 9 inches in diameter and have been turned in sections of 6 and 8 feet. The plinths on which they rest weigh from 16 to 25 tons each, and all of the other stone work is in proportion. For instance, the slabs that rest on these pillars forming the colonnade floor are 9 x 13 feet while in the cornice and other sections there are single sections of granite that weigh as high as 18 tons. The sections of the columns weigh up to 12 tons. Needless to say the work of placing these requires extreme care.

Bank under construction as viewed through overhead wires.

The steel is of equal solidity and the same atmosphere of "bigness" prevades the whole structure. The main banking room has dimensions of 140 by 85 feet and is 59 feet to the ceiling. To support the apartments above, the design called for three truss girders, each 90 feet in length and weighing 42 tons, and by the way they are the largest that have yet been installed in a Canadian building. They were delivered on the work in sections, assembled and then hoisted by a pair of gin poles to their resting places. In this work as in the placing of the stone the contractors. Messrs, Norcross Bros., have progressed without a slip or accident. Had it not been for an unfortunate fire at the Iberville stone cutting plant of the company, all of the stone work would have been in position now. In that fire a large amount of stone, cut ready for shipment, was damaged and had to be duplicated. As much of the stone used required a great expenditure of labor in cutting the work has been considerably delayed in this department.

However it has not delayed the balance of the work and under the direction of W. P. Mitchell, superintendent in charge, the interior finishing is well advanced. Steel deliveries were exceedingly slow on many sections but despite it, all the work has made notable progress. The copper roof has been placed over the greater part of the building so that the interior finishers have been able to make good progress.

It is in the interior that one gets probably the best idea of the development of modern buildings and building practice. Heavy flat arch floors capable of supporting a team with heavy loaded wagon have been laid on the first floor and all walls and partitions are of porous tile. In the basement are the safety deposit vaults and general bank vaults. This basement is fitted entirely in white glazed tile and marble. The public approach is from the main banking floor down easy winding stairs, while an elevator gives access for the bank employes. The vaults are now under construction, and when completed will be a model of strength. The heating system is carried in pockets in the wall, each covered by a bronze grill framed in marble.

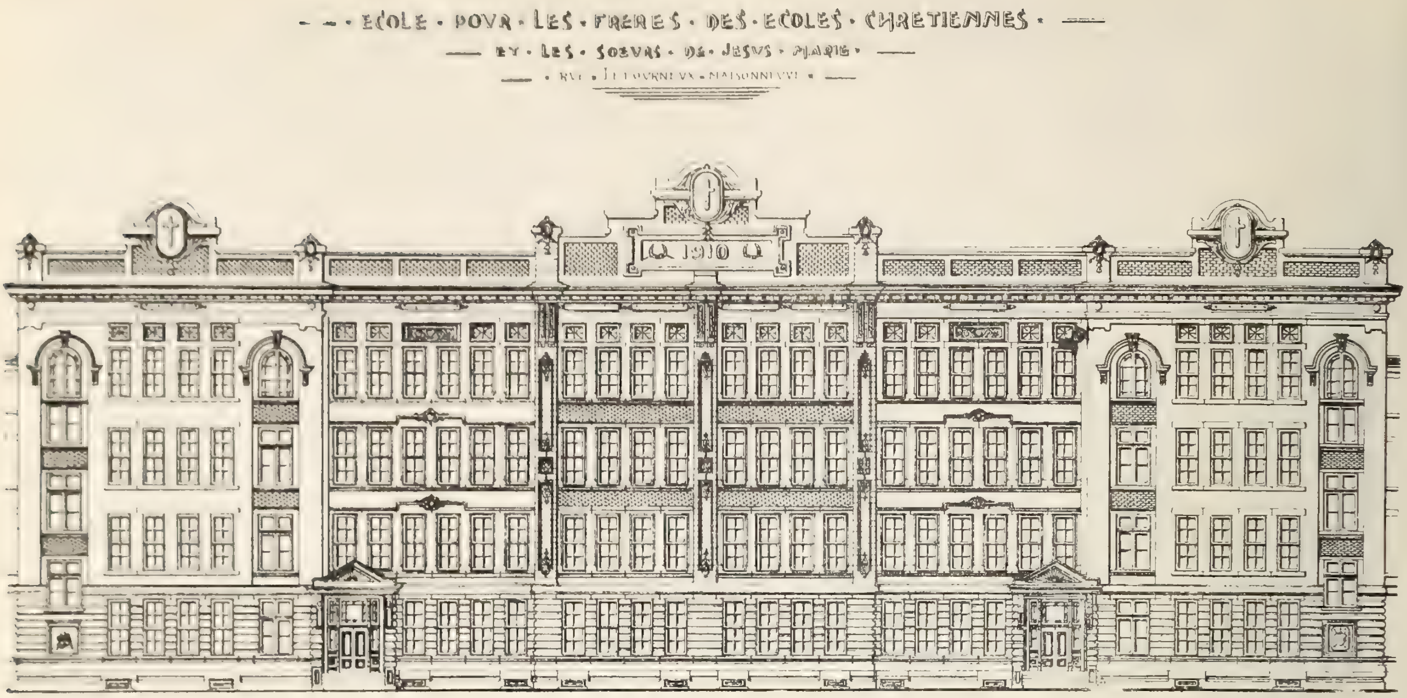
Though the main banking room is now in the hands of the plasterers and ceiling decorators some idea may be gained of its general appearance. In it are 30 circular marble columns and four square ones running to the ceiling which two-thirds of the way up support the entablatures. They are of Botticino marble and the floor will be finished in pink Tennessee. The Botticino will be used for wainscoting and the ceiling is being finished in dead white, with a simple and dignified conventional panel design. In fact the whole effect is striking in its simplicity which with the magnitude of the structure is its best ornament.

It is the intention of the management to make this office self contained in every respect. Above the banking room there are two flats of apartments which will be fitted up for the use of the staff. In fact it will be almost in the nature of a club, for in addition to the apartments there will be baths, sitting rooms, a fully equipped dining room and billiard room.

The foundation of the building is exceptional. It is carried on a solid monolith of ferro-concrete grillage, beneath which are a number of expanding piers where the main stresses exist. The bases and side walls of the vault system are carried well into this monolith.

* * *

It is seldom that a man dies from overwork, or one's conscience becomes warped from strenuous use. It is generally abuse that results in these things.


ECOLE · POUR · LES · FRERES · DES · ECOLES · CHRETIENNES ·
ET · LES · SOEURS · DE · JESUS · MARIE ·
· RUE · LETOURNEUX · MAISONNEUVE ·
1910

New Montreal School

Good progress is being made with the construction of the Christian Brothers' and Sisters' School on Letourneux avenue, Maisonneuve, the walls being completed and the roof in place. The construction is of stone on stone foundations. The building has a frontage of 360 feet, a depth of 70 feet and the greatest height is 93 feet. There are four storeys and basement to the main building which will have accommodation for two thousand pupils. One-half of the building will be in charge of the Christian Brothers, and this section will be flanked by the Brothers' residence. The other half will be for the use of the girls who will be in attendance, and the nuns' residence will also be on that side of the building. The illustration shows the main building, both the residence wings being omitted. In design these resemble the central structure. The cost of this school will be in the neighborhood of $300,000, nd it is expected that it will be completed about the end of November.

A special feature of the structure is the fire escape furnished by a firm in Kentucky. One fire escape will be placed in rear of the boys' section and the other in rear of the girls.' The escape consists of a spiral steel tube running from the top storey to the ground in a fireproof encasement. Entrance to it can be gained from every storey and the arrangement enables children from all the storeys to enter very rapidly and slide down without injury to one another. During a test recently made before government and civic authorities one thousand children left their class rooms and reached the ground safely in three minutes and a half. The building will be heated by hot water and a good system of ventilation has been provided. The building was planned by and the work is being carried out under the supervision of Mr. C. A. Reeves, architect, of Montreal. The contractors for the central building were Messrs. Trudel & Company; for the Brothers' section, Mr. A. Gratton and for the Sisters' section, Mr. A. Dansereau. The steel work was manufactured and erected by the Phoenix Bridge Company.

U. S. Cement Production

Cement production in the United States during 1910, has been officially reported upon by Mr. Ernest F. Burchard, of the United States Geographical Survey. These figures compared with those of 1909, are as follows:

	Value 1909	1910
Natural & Puzzolan	$ 752,209	$ 546,292
Portland	52,858,354	67,506,479
Total	$53,610,563	$68,052,771

In the United States and Canada there are already about 600 central stations for the distribution of steam and hot water to the residents of some 300 towns, ranging in population from more than 10,000 inhabitants to less than 5,000 inhabitants, the first establishment of this kind dating from the year 1876.

Regarding the increased business activities in the West further evidence is given in the following report from Brandon. The subject is the want of manufacturers, and goes on to say: A local firm inquired of a lithographic firm in the East respecting the production of some work, and they replied, "At all events, we are so busy just at the present time, that we would be unable to undertake the work for immediate delivery." This kind of reply is being continually received here in the West;—so that we think that it would be a good opportunity for some of the English firms to supply the want in Brandon. It is useless for us to look to the United States, as they are as busy as we.

The floor of one of the new steel dining cars of the Pennsylvania Railway is covered with cork slabs compressed from an original thickness of 14 in. to less than ½ in. The material gives a sure but silent foothold, and if its use proves satisfactory after an extended trial all the company's steel dining cars may be so equipped.

Reinforced Concrete in Road Construction

Modern traffic, by reason of its increased weight and speed, imposes the necessity of strengthening the foundations and crusts of main roads. It will further be necessary to reconstruct a large number of small bridges over streams and similar obstacles. The writer draws attention to reinforced concrete as the best material for the work, as it is also the most economical and convenient. Most of these small bridges are unequal to the task of carrying heavy loads through—(1) Defective foundations and yielding abutments; (2) defective joints and mortar; (3) bad construction and shape. For reconstruction, the limiting conditions to be reckoned with are—(1) Span short, say 5 ft. to 20 ft.; (2) rise limited; (3) foundations often bad; (4) materials will have to be carted to the site, and labor is more or less unskilled; (5) the same type of culvert or bridge will have to be reproduced many times. For bridges of the length named, steel is out of the question, so that brick or masonry is the alternative to plain or reinforced concrete.

The objections to masonry are—(1) It must be built as an arch; (2) it is slow in construction; (3) costly; and (4) it obstructs the waterway. Many of these objections apply to brickwork. Centering is necessary for brickwork and masonry. There is little to be said in favor of plain concrete against its two rivals.

The special merits of reinforced concrete are—(1) It can be built as a flat beam: (a) The reactions are vertical—the pressure on the abutments can be very easily distributed; (b) centering is made of straight square timber, easily fixed, and can be used over and over again; (c) the waterway is not obstructed. (2) The amount of materials is a minumum and the steel of simple bars. Engineers have hitherto fought shy of reinforced concrete, partly because of its novelty, partly because of the uncertainty of the life of the steel, and partly because of the way it was exploited by firms holding patent rights. The calculations are simpler than for beam and girder work.

Moose Jaw Sewerage System

One of the largest enterprises of the city of Moose Jaw this year is in connection with its sewerage system, approximating $400,000 being spent on the work.

The sewage disposal plant is under construction at the east end of the city. The work is being done by W. Manders, whose contract is for $125,000. Material and labor supplied, and inspection done by the city brings the cost up to approximately $160,000. In return for the expenditure of this sum, the city gets one of the most complete and perfect sewage disposal plants that can be obtained. When the city's waste has passed through it, it will have the appearance of pure water and it is said that no harm would result from drinking it. It is expected that the plant will be completed and in use this fall.

At present the site of the plant presents an extensive amount of excavation and huge concrete work. The plant is being connected with the existing sewer system of the city by a twenty-four inch trunk sewer. This has to pass down under the river. A siphon arrangement provides for the sewage passing down under the river bed and up on the east side.

The trunk sewer empties, through screens which remove all large hard substances, into an equalizing tank, the dimensions of which are 160 x 80 feet. The purpose of this tank is merely to secure an even flow to the plant proper. There is more sewage at some times of the day than at others, of course. The result would be that part of the time the plant would be flooded, and at other times there would be scarcely anything going through. By means of the equalizing tank a steady flow is secured. The top of this tank is about the same level as the ground. It will be covered over with earth.

From the equalizing tank the sewage is pumped by a compressed air arrangement into the separator tanks, of which there are three. These tanks are really separate compartments of a large concrete basin, 72 x 57 feet. In them the sewage lies quiet, allowing the solids to settle to the bottom. Through a "sludge" drain, the solid part of the sewage passes through to a compartment at the end of the basin. Here it is pumped out into beds that lie exposed to the sun, where it dries up and can, in a few days, be carted away as fertilizer.

The liquid part of the sewage flows off into the filtration beds. Of these there 26 in a concrete basin 250 feet long by 150 wide. The liquid flows out over trays in which there are thousands of small openings which spray it upon the beds. The beds themselves are made up of piles of stone on a concrete base in which, at intervals, are drains sloping downward to a large central drain.

The large central drain leads out towards the river. On the way it passes through a disinfecting chamber, where, in case of any infections epidemic in the city, the offal can be thoroughly disinfected. Before passing into the river the sewage goes into a large settling pond. After all this process of separating, filtering and disinfecting, it will readily be understood that there is not much of the impure left. The material is emptied into the river in such a state that no harm can result to those who live along the river below.

The disposal plant is built large enough to serve a population of 35,000, and it can readily be extended when required. The plans, which entailed an immense amount of work, were prepared by City Engineer Wilson and his assistant, Mr. R. G. Saunders.

During a discussion at the N. A. C. U. convention in New York of the necessity for storing sand to become dry before using, to insure uniform mixing, C. M. Powell, who read a valuable paper on concrete tile plants, said some tests he had made showed that a cubic foot of damp sand weighed 87 pounds and a cubic foot of dry sand 106 pounds—this as illustrating the great difference in the amount of sand in a batch when used wet and when used dry. The sand particles covered by a film of moisture pushed each other far enough apart so that a cubic foot weighed 19 pounds less than when dry and they packed together closely.

A dam 192 ft. high at Baltimore, Md., has been recommended as a part of the proposed improvements in the water-supply of that city. The recommendation was made by a committee acting as advisers of the mayor. The dam would form a storage reservoir with a capacity of 3,000,000,000 gals., located on the Gunpowder River about a half mile above the present Loch Raven dam.

Sheet Metal Protection for Trestle Work

The Value of Protecting Trestle Timbers from Exposure—Methods of Applying Sheet Coverings Treatment with Creosoted Timbers

The covering of trestle caps and stringers with galvanized iron, for fire protection, is a matter of ordinary practice, and incidental prolongation of the life of the timber has been observed where such covering has been used. Some years ago Mr. Hunter McDonald, chief engineer of the Nashville, Chattanooga, and St. Louis Ry., became so impressed with the preserving effect of such covering on the timber that he worked out special plans for applying it in a manner to more effectually exclude water from entering the timber than had been the case where fire protection was the only object in view.

Yellow pine timber used in the top chords of combination trusses, which had been covered with tin on top and weather-boarded on the sides, was found to be entirely sound after twenty years of service, and was used again for trestle stringers. Trestle caps which had been covered on top with galvanized-iron sheets were found to be sound after a service of nineteen years, and stringers which had been in service on the Cincinnati Southern R. R. twenty-one years had shown remarkable preservation, notwithstanding the fact that the galvanized-iron covering had not been driven through the sheet-metal covering on both the caps and the stringers mentioned, in accordance with ordinary practice, no regard being paid to the perforation of the sheets. As local decay was observed about the drift-holes, it was obvious that wherever such perforation could be avoided it should be done. The value of this method of protecting timber trestles from decay was so convincing that all stringers and caps which have been renewed on the Nashville, Chattanooga, and St. Louis Ry. during the past eleven years have been so protected, and the work has been described by Mr. McDonald in a paper read before the Engineering Association of the South.

In order to prevent drift-bolting the timber as far as possible, and to take measures for prevention of the entrance of water where such drift-bolting must be done; and to facilitate renewal of the sheet metal when corroded, Mr. McDonald has adopted the following plans:—Trestle stringers are permitted to rest directly upon the caps without sheet metal between them, and the cap is protected by sheet covering in three sections, one coming between the two lines of stringers, and the other two sections outside the stringers. The galvanized-iron sheets covering the caps are bent upward against the sides of the stringers, and extend about 3 in. over the sides of the cap, and are bent downward at an angle of about 45° over the top edges of the cap, so that the drippings from the covering fall clear of the cap. The part of the galvanized sheet bent upward against the side of the stringer is overlapped, or, rather, overhung, by the extended and downwardly-bent covering of the stringer, so that both the stringers and the caps are entirely protected against the entrance of water. In order to avoid drift-bolting the stringers to the caps, the former are anchored to the cap by means of a malleable casting which enters the packing space between the stringers, engaging the lower packing-bolt, and a flange on the lower part of this casting is then spiked to the side of the cap. In other words, this casting is a packing-ring with a tail-piece extending downward against the side of the cap; and in addition to the spiking of this tailpiece to the cap, it is secured to the pile beneath by means of a hook-bolt.

The drift-bolting of the ties to the stringers has not been dispensed with, but the bolts are applied in such a way as to prevent perforating the covering in a manner to admit water. This is done by driving the bolt into the tie from the bottom upwards. The bolt is securely driven into the stringer, in a bored hole which is first filled with creosote oil. In order to make a clean-cut perforation of the sheet covering the top end of the bolt is cut off in a lathe instead of being sheared in the usual way. The sheet covering of the stringer is perforated from the bottom upwards, and in order to prevent the entrance of moisture around the drift-bolt a 1½ in. washer is placed on top of the stringer around the bolt, so that the galvanized covering is bulged upward as the sheet is settled home by the weight of the tie. A recess for this upward bulge is a hole 2 in. in diameter and ¼ in. deep, bored in the bottom of the tie concentric with the dowel-hole. In short, the arrangement is such that the tendency of the water about dowel-holes through the sheet is to drain away from the holes, instead of entering them by capillary action.

Of course, the life of the galvanized sheets is comparatively short, lasting only about five years, and experiments have been conducted to test the durability of various samples of galvanized sheets of both charcoal iron and the ordinary steel, the latter being commonly called "galvanized iron." These experiments have not as yet been concluded, but the indications are such that there has arisen a question as to whether the ungalvanized black iron painted with two coats of red-lead would not be more economical than galvanized iron.

The method of applying the sheet coverings is such that it can be renewed conveniently. The coverings on the caps are readily accessible, while on the stringers only necessary to jack up the ties clear of the stringers and the drift-bolts in order to remove the old sheets and insert the new ones.

The plans also cover the use of galvanized-iron protection for the caps and stringers of trestles with ballasted floors. In this work the protection for both the caps and stringers is applied as in open deck trestles, but the spiking of the creosoted floor-plank to the tops of the stringers is avoided by lag-screwing to the bottoms of the plank angle castings, the lower legs of which are spiked to the sides of the stringers. It is desirable to avoid spiking the planks to the stringers for two reasons:—In the first place, spikes driven through the creosoted plank would admit water which would start decay in the interior fibres of the plank where the creosote has not penetrated, and the spikes would also perforate the sheet covering of the stringer.

It is found that the first cost of covering caps and stringers in this manner amounts to about half of the expense required for creosoting the timbers protected. As the galvanized covering must be renewed at intervals of about five years, it could probably be shown that the ultimate economy should be in favor of the creosoted timbers were it not for the fact that the creosoted stringers and caps require covering for fire protection, the same as do the untreated timbers. There is still the further consideration that the sheet covering can at once be applied to existing stringers that are in good condition without going to the expense of substituting creosoted ones, thus immediately converting the trestle into one with a ballasted top, if desired. To secure the best results with creosoted timbers, they should be framed in advance of creosoting. Such advance framing is always recommended by the timber-treating specialists; but for purposes of renewals on old structures it is a practice that is very difficult, or practically impossible to carry out. The absence of spikes to secure the planks to the stringers also permits jacking up the floor clear of the stringers for inspection of the condition of the stringers, as well as the renewal of the sheet covering, which would not be the case with planks spiked down upon creosoted stringers.—The Railway and Engineering Review.

The Modern Incinerator

The destruction of waste matter in towns and cities is inseparably connected with the highest efficiency of applied modern sanitary science, and great progress has been made in this branch of municipal work during the last quarter of a century in as far as relates to the successful and sanitary destroying of dangerous matters.

The earlier types of incinerators were not an unmixed blessing and were often considered a greater and more concentrated nuisance than the tipping method which they were intended to replace. But the greater necessity and urgency of the conditions required that something must be done, and as sanitary engineers universally recognized that fire was the only safe and sure way to dispose of deleterious matter, many devices and continual experiments were made to find the best solution of this problem coupled with sanitary efficiency and economy of fuel and labor.

The refuse destructor or incinerator has now become an absolute necessity in all towns and cities alive to the necessity of sanitary precautions affecting the health of their inhabitants. The modern growth, especially in sections of the great west, where towns spring up in a night, and become cities in a few years, with large populations, and owing to the rapid growth are not able to provide adequate sewer accommodation, cause naturally the accumulation of great quantities of refuse matter, on the surface of which the soakage of summer rains and winter snows drive into the earth, contaminating the water supply and causing epidemics of all kinds. It is a regrettable feature of our rapid development that owing to these unsanitary conditions with re-occurring spring, terrible consequences, sickness, disease and death occur in many of our new centres of population. Town councils and municipal guardians of health commit criminal negligence in not providing means to deal with such conditions when the best and most efficient means are at hand to improve them. A well designed incinerator, coupled with a systematic garbage and refuse collection, will eliminate these dangers and maintain the health of any town or city in an efficient and satisfactory manner.

The type of destructor used is of great importance and should possess cremating capacity reasonably in excess of the requirements at the time of erection to provide for future expansion. An incinerator should be selected that will thoroughly and sanitarily destroy every kind of refuse matter, leaving a residue absolutely clean and wholesome, and its second qualification should be that the operation should be done with the minimum of labor, fuel and cost of maintenance.

The generating of steam from the heated gases of incinerators is a process that has received considerable study, and has been tried in various old country cities, but it is doubtful if the results so far obtained can be said to warrant the great increase in first cost and also the increased cost of fuel and labor in operation. The varying degrees of moisture in different kinds of refuse matter and constant charging of the cremating chambers make it very intermittent and uncertain in maintaining any steady steam pressure, and making it very difficult to apply the steam produced to mechanical uses economically. The tendency where steam is generated, too, seems to weaken and keep down the temperature in the cremating chambers, and as continuous high temperature is all important for the sanitary destruction of refuse it appears the generation of steam from garbage has some drawbacks, and especially where the nature of the refuse is very liquid, such as slops, night soil, sludge,etc.

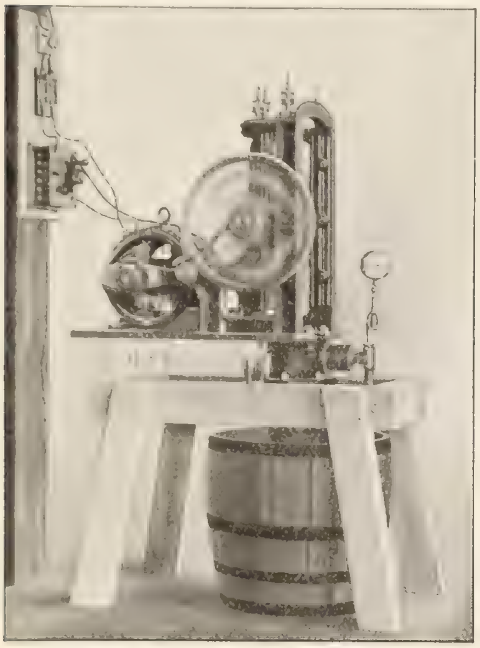
The American practice has been with the few experiments in reduction plants (which have not been commercially successful), to aim at the sanitary destruction of refuse with the minimum cost for fuel and labor.

The introduction of the steel clad incinerator by the Toronto Furnace & Crematory Company appears to meet the requirements very fully. It contains many novel and patented features, the result of long experience and study of the requirements, and is made in sizes adapted to uses of towns and cities from 3,000 to 500,000 inhabitants, and at prices which enable even small communities to take advantage of the incinerator method to dispose of their waste matter. A recent installation in a town of 6,000 inhabitants, costing complete with shelter and approaches less than $7,000, is destroying from six to ten team loads of garbage and store refuse, together with three team loads of night soil, equivalent to 14½ tons daily, with ½ ton of coal. The labor of one man to stoke, and clean away the residue is all that is necessary to manage this plant, which has been running now for over one year in weather conditions varying from 90 degrees of heat to 40 degrees below zero Fahrenheit, and doing the work without intermission and without nuisance of any kind from the stack or from the plant, owing to its low first cost, fuel and labor, economy in operation and ability to destroy any kind of refuse sanitarily and completely. This type has been enthusiastically endorsed by the Dominion and Provincial sanitary authorities, and should be investigated by the officers of any municipality contemplating the erection of an incinerator plant.

A good deal of speculation is being indulged in as a result of the purchase, by a syndicate, of a block of land at present occupied by stores and dwellings and bounded by St. Catherine, Bleury, St. Edward and St. Alexander streets in the heart of the uptown business section of Montreal. Various portions of this block have changed hands frequently within the last five years. Now this syndicate has obtained possession of all but one small strip occupied by the city as a fire station. No doubt they will acquire this in a very short time. The city has already secured a new site for this station. It is stated that the syndicate has paid $377,000 for the property. The general opinion seems to be that a departmental store will be erected on this site. Again it has been reported that a theatre would be the most likely kind of building to be put up on such valuable property, while there is always the possibility of a hotel getting the position. It may be further remarked that this property is directly in rear of the Jesuit church of St. Mary's college recently reported to have been acquired for Canadian Northern railway terminal. This report [illegible], but new developments [illegible] at any moment.

A New Type of Pumping Motor

A pumping engine which bids fair to soon come into extensive use is one of a non-pulsating type, manufactured by the Luitwieler Pumping Engine Company. In its design there is a radical departure in that all its reciprocating parts are balanced, and entirely free from dead centres which cause intense vibration, water hammer, as well as gear back lash. This type of engine is self-contained on one base with the driving power, or is made, if desired, with belt drive. So perfect is its balance and operation that it will work under a full load on an ordinary floor without bolting or without special foundation of any kind.



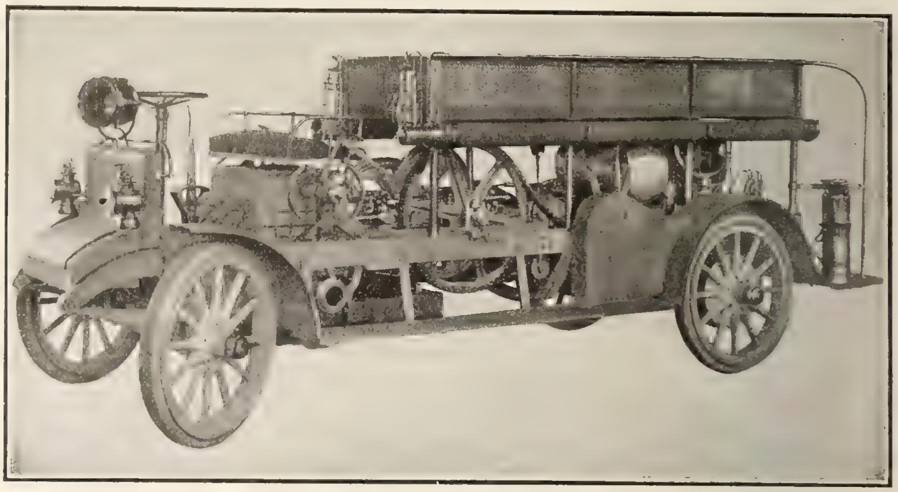
Luitwieler under Test.

One of the above illustrations shows a three horse power electrically-driven pumping engine under test, the time of exposure in taking the photograph having been eight minutes. The engine is set as shown upon four water glasses and the pencil placed upon top of the frame stands erect showing absence of bound, jar or vibration. The other illustration shows one of their motor fire trucks in which this type of pumping engine is exclusively used, the one in this case being of double-acting triplex design. In this application the great advantage of lack of vibration of the power element is evident. The system of pumping under these conditions claims to be the only one in use of the non-pulsating type, having over 30 per cent. higher efficiency than the present steam fire pumps in use. The General Machinery Company, Limited, of Toronto, are the Canadian agents for the Luitwieler pumping engines, who claim on a recent installation to have effected a saving of 80 per cent. over the driving mechanism previously used.

Development in St. Lambert, Que.

Among the suburban districts in the neighborhood of Montreal, the Town of St. Lambert is an example of rapid growth. This is due in part to the car facilities, the heart of the city being reached in about twelve minutes, and to the pleasant location of the town. Within two years the population has enormously increased, and land values have in some instances more than doubled. To meet the new conditions the council has undertaken a large scheme of drainage and street improvements, including a combined storm and sewage plan. It was found that the old domestic sewage system was in very bad condition and the new plans consequently involved a complete cut of fresh trenches. When the work was about to be commenced a neighboring council obtained an injunction against the sewage being dumped into the St. Lawrence, which it was able to do under the provincial health order of 1897. This injunction compelled St. Lambert to considerably modify its plans, particularly with regard to sewage. The council has now laid six-inch house communication pipe from the main sewer to the boundary of the street on every lot. Work is now being done in installing a septic and filtration system. About 9,000 feet of streets have been opened and closed again, and sewers laid for the same distance.

Eight thousand six hundred feet of street has recently been graded and seven thousand cubic yards of material removed. One street fifty feet wide and 900 feet long has been laid with Telford macadam. The town has also installed a complete road plant, including crushers, engines and roller, and has purchased about $17,000 worth of material. Many sidewalks have been laid with 18-inch curb and 18-inch gutter at a price of $1.31 per running foot. Altogether about $50,000 have been spent.



Luitwieler Fire Truck

The council is carrying out a separate scheme of drainage in Brooklyn Park, an adjoining district, on which sixty men are employed. Counting this number, an average of 260 men are employed. Mr. A. S. Dickison is the engineer.

Concrete Floor Surfaces

To obviate undue wear of concrete floors and consequent dust it is desirable that the surface should consist largely of hard stone aggregate in particles of not less than ⅛-in. gauge. The use of concrete with a liberal proportion of water is apt to bring small particles to the surface during the work of trowelling. If the finishing layer is applied before the main body of the concrete has hardened the thickness of ¾ in. is usually ample, but if applied after the building is practically complete the thickness should be at least 1½ in., so that the new material may be capable of standing without relying upon bond with the old work beneath. By taking care to make the final coat of durable character, a concrete floor should be free from "dusting," but in case remedial measures should become necessary one or two coats of boiled oil or treatment with sodium silicate solution will be found effective.

Westmount city council has authorized Mayor Rutherford, Alderman Sherrard and Mr. Archibald Currie, city surveyor, to attend the annual convention of the Union of Canadian Municipalities which takes place at Quebec the last three days of this month.

A Prominent Montreal Architect

Mr. Charles A. Reeves, architect, 58 St. James Street, Montreal, is one of the best known gentlemen in his profession in this city. Although not yet forty years of age he has achieved an enviable reputation and has had committed to his charge a number of important contracts, both for the city of Montreal and of Maisonneuve, as well as of other places in this province. A son of Mr. Charles Reeves of Pointe-aux-Trembles, the subject of this sketch had the privilege of attending college in Montreal and pursued his studies preparatory to business and professional life at the Plateau Commercial Academy, where his splendid natural talents, particularly in mathematics and designing, soon distinguished him. His application to study, his indomitable perseverance and his determination to succeed won for him the esteem of the professors and the admiration of his fellow students. Upon deciding to enter the profession of architecture, the same ability and determination that had marked his student days soon brought him into prominence among the members of his profession. The Maisonneuve parish church, the Viauville school, the Slater Shoe factory, the Kingbury Shoe factory, the Royal Shoe factory, the factory of Laniel & Company, a couple of fire stations, and a large number of private residences are among the structures which have been designed and erected under his direction. Mr. Reeves speaks English and French with equal fluency. He was formerly one of the assessors of the city of Maisonneuve and is at present building inspector for that municipality. He acted as arbitrator in connection with extensive expropriations in Maisonneuve in 1901. Mr. Reeves is described and regarded with pride among his compatriots as "a self-made man."

Vancouver's New Sewerage System

The city of Vancouver has accepted City Engineer Smith's bid for the construction of the first large portion of the proposed sewer improvement and extension work to be taken under the authority of a recent by-law, which authorized the expenditure of $300,000 for this purpose. Half a dozen contracting firms were among the bidders. The work will be undertaken by the city and will be carried out by day labor.

The work consists of the construction of approximately 9,000 feet of egg-shaped brick or concrete sewer, and approximately 12,500 feet of cement or vitrified circular sewer pipe, ranging from fourteen to twenty-four inches in diameter with the necessary manholes, lamp-holes, putfalls chamber and pumping station, including approximately 22,500 cubic yards of excavation.

The work will provide main sewers for the northeast and northwest districts of the city.

Cork Paving Bricks

A sanitary non-absorbant, and relatively noiseless material suitable for carriage drives, courtyards, and other places has recently been patented in the United States, under the name of cork brick. It consists of finely-granulated cork mixed with asphalt and pressed into the form of bricks, measuring 9 in. by 4 in. by 2 in. The bricks are laid flat on any level foundation. Where laid on concrete the foundation should first be covered with a thin layer of hot asphalt or a bed of sand. If the foundation consists of broken stone a layer of sand should be spread before placing the bricks, and where laid on wood the surface should be covered with hot asphalt. It is stated that the bricks absorb less than 1½ per cent. of water by immersion and that they afford an excellent foothold whether wet or dry.

The Situation in Montreal

Montreal, August 19th, 1911.

The carpenters' strike has at last been amicably settled, the men securing the minimum wage of 35 cents an hour from most employers. The principal contractors in the city who fought the strike rejoice in that they were able to proceed with their work without serious interruption at any time. The Harbor Commissioners are employing men indiscriminately at union wages, while Messrs. P. Lyall & Company state that their policy of employing men was in no wise disturbed by the strike.

A number of contracts were delayed a few days and the cost of several of them will be increased considerably by this advance in the minimum wage, while it is stated that a large number of inferior mechanics will shortly be laid off on this account.

At present the building trade is in the midst of its greatest rush and the progress of the large office buildings in the centre of the city is creating considerable interest. Prices double those of a year ago are being paid for ordinary properties occupied by small stores or residences on Aylmer street between St. Catherine and Sherbrooke streets owing to the impression existing that this will be the site of the new Canadian Northern terminals, while other high priced properties that have recently changed hands will be the site of departmental stores and other buildings that must shortly give way to transportation demands.

Mr. H. B. R. Craig has resigned his position as city engineer of Kingston to become senior assistant to the district engineer of the Public Works Department, with his headquarters at Windsor. Mr. Craig was first appointed to the position of city engineer of Kingston on December 1st, 1904. After several years he resigned, however, and returned to railway work, but was again appointed city engineer in March, 1908, which position he has held up to the present time.

Construction Work in Ottawa

Ottawa, August 21st.

Building is progressing steadily in Ottawa and all the trades as well as all the contractors are busy. There are many more houses being erected now than earlier in the year. The builders held back in the spring partly because of funds, and partly because they were well tied up with contracts for commercial building or remodeling more expensive houses. However, the indications are that houses will be none too plentiful this fall. Forseeing this, these men are hurriedly starting houses of the variety to meet this demand. Double tenements seem to be the best sellers and for this reason more of these than any other variety are being erected.

The only change in prices is in the case of brick. There has been a general advance of from 50 cents to $1 a thousand due to the higher wages and particularly the increased cost of cartage. The price of veneer clay brick is now $13 delivered to any part of the city, which is a dollar higher than it was in the spring. The prices of cheaper brick has advanced proportionately.

There was a prospect of an advance in galvanized iron work. However no action will be taken until after the election at least. There is a five per cent. duty on galvanized sheets coming in from the United States which would be removed if reciprocity carried. However the firms using large quantities of sheet metal in the city do not anticipate that this will make any difference in the cost to them. They state that the British price usually guides the American price, and that if the American producers can charge five per cent. more, and yet compete with the British prices, that they will do it.

Wages remain fairly satisfactory, and there is little scarcity of labor. Cheap labor continues to be in good demand.

F. C. Graves, C. A. Douglas and R. McMorran will erect a commercial building on Rideau street. It will cost in the neighborhood of $25,000. It will be only two storeys high for the present and will be built of solid brick. Mr. J. A. Ewart is the architect and Alex. Garvock and J. and C. Low the contractors.

The government has had a large staff of workmen making repairs to the government buildings and there have been two big contracts let for changes to Rideau hall. The most important of the changes there is the erection of a large garage which A. G. Marchall is building at a cost of over $15,000.

The factory for the Rolla Crain Company, Limited, has been started. It is one storey high and covers nearly two lots. The firm will move its lithographing and printing plants to this place.

Work is well under way on the C. P. R. round house. This is a reinforced concrete building to cost around $60,000. It is a short distance west of the old round house which last year was for the most part destroyed by fire.

The finishing touches are being put on the Chateau Laurier and it will be ready for occupation this fall. The work of the annexes to the new Central station are under way.

The Beaver Board company has purchased a site just outside the city on which will be erected a large factory similar to the one outside of Buffalo. It will be similar in design to that one. Up to the present the company has been manufacturing in a building at the Chaudiers, but the demand has become so great for the product that this place is entirely incapable to supply it. Mr. William MacGlashan, president of the Beaver Board was in Ottawa arranging for the purchase of the property. It is proposed in connection with this factory that a model town will also be erected.

The question of factory sites has come in for a great deal of discussion in this city, and many firms who came to Ottawa found the land suitable for factory sites too high priced for that purpose. Accordingly an effort has been made to solve the difficulty, with considerable success. Already sites in the outskirts convenient to the railways has been offered free to manufacturing concerns and a number of others have been offered at low prices per acre. It now looks as if the city would be in a position to offer unusual opportunities in this connection.

The Model Homes Association has its plans now on file. These plans are particularly good, and are available to persons wishing to secure them for a home which would be suitable for Canadian needs, and at the same time artistic and cheap to construct.

Mr. R. W. Farley has begun the preliminary survey of the electric road from Ottawa to Smiths Falls and Kingston.

The estimated cost of the improvements to Sparks street, including the building of the conduits for wires, the repaving and building of new sidewalks on the street is $75,000, according to the city engineer, who has just completed the plans for the conduiting of all the wires on the street.

The new plans for the conduits call for an expenditure of $45,000, about $15,000 more than was estimated under the first plan prepared. The new plan calls for conduits for the high tension and low tension wires on either side of the street, and the extension of the conduit as far as Sussex street. This will rid Sparks street from Bank to the Plaza and on Rideau to Sussex street of all poles and overhead wires.

The work will not be undertaken until next spring, however. The companies interested, the Ottawa Electric company, G. N. W. Telegraph company, the municipal electrical department, and the C. P. R. Telegraph company will have a conference in the near future, and as the plans now submitted were made with a view of meeting the objections and needs of all concerned, they will probably be accepted. A division has been made in the manholes so that each company will have separate room in which to work.

The high and low tension systems will be in different conduits, which will do away with the danger to the delicate telegraph wires.

The first part of the work of improving the street, according to the city engineer, will be to allow the Ottawa Gas Company to build its new main along the street this fall, so that everything may be ready by spring for the city to go ahead. The pavement will first be laid then, and afterwards the conduits. The conduits will be laid under the sidewalks on either side, so that in addition to the new pavement the street will also have new sidewalks.

The only clay resources of Prince Edward Island are of Pleistochene age. Common clay bricks are found at a number of points but are worked to only a slight extent.

The City of Montreal is paying over four thousand dollars a day in wages for the laying of permanent road and sidewalk pavements, besides the cost of similar work being done by contractors.

From 1909 the Canadian production of stone for building purposes amounted to 1,170,550 or 37.4 per cent. of the total stone production. Quebec shows the largest output with Ontario next. The kinds of stone quarried were classed as granite, limestone, sandstone and marble.

The Foundation Company's Chief Engineer

In connection with the erection of the mammoth Woolworth Building in New York, a 55-storey building 750 feet in height, we notice with pleasure the name of Mr. John W. Doty, whose position as chief engineer both of the Foundation Company, of New York, and the Foundation Company, Limited, of Montreal, is one that spells responsibility itself, when we consider the numerous other gigantic enterprises in which these firms are simultaneously interested. Mr. John W. Doty is a son of Mr. F. W. Doty, president of the Doty Iron Works, Goderich, Ont. He was born in Toronto in 1879 and received his early education in the city schools. He later attended the Rensselaer Polytechnic Institute and graduated in 1902 with the degree of civil engineer. Mr. Doty was also for some time in the employ of the John Doty Iron Works and the Toronto Ferry Company, as will be remembered by those who were acquainted with these firms a decade or more ago. Since graduation Mr. Doty has been with the Foundation Company, and has been for the past several years one of the directors of the firm. The company needs no introduction as every one interested in large buildings and similar construction work knows its reputation to be world wide. Specializing as they do in foundation engineering and construction an infinite amount of engineering skill and ingenuity is in constant demand, as the height of the skyscraper and the consequent greater weight and instability of the structure continues to increase.

Mr. John W. Doty, Chief Engineer, Foundation Company.

The foundation for the Woolworth Building will require 69 pneumatic caissons to be sunk through the quicksand to bed rock to twenty feet below the curb and ninety feet below water level. The quicksand strata presents considerable difficulty as it admits water after the first thirty feet of excavation has been reached unless caisson work with an air pressure of 45 pounds per square inch be used to withhold the influx of water. It is stated that in addition to having the honor of being the highest building in the world, the Woolworth Building may with equal propriety boast of having one of the most secure foundations within the State of New York. This distinction will reflect considerable credit upon the Foundation Company and upon the Canadian, Mr. John W. Doty, its engineer.

The original name of the company was the Foundation & Contracting Company, but was changed in July, 1903, to the present title. The company is one of the most prominent concerns in its line and is quite at home with such large contracts as the present Woolworth Building undertaking. It will be remembered that last year the Foundation Company had a contract for the construction of the foundation for the municipal buildings at the Manhattan terminal of the New York and Brooklyn Bridge, which up to that time was one of the largest of its kind every given out, and entailed the cost of over a million dollars for foundation work alone. The Foundation Company of Montreal was incorporated in May, 1910. They have a number of important contracts throughout the Dominion, and whose work has several times been subjects of articles in previous issues of the Contract Record.

It will be remembered by many who had read a lengthy article by Benjamin Brooks which appeared in McClure's Magazine for May, 1909, that Mr. John W. Doty was spoken of therein in connection with the simplification of the automatic sinking of concrete piers, which was at that time a remarkable engineering feat.

Personal Notes

W. A. Hungerford, a prominent mining engineer and general manager of the Canadian Talc & Silica Company, with mines at Elderado, died at his home at Madoc, Ont., on August 15th.

Mr. S. Harvey, A.M. Inst. C.E., A.M.I.M.E., who for some time past has been in the city mains drainage department, left last week for Lethbridge, Alta., to accept a position in the city engineer's department there.

Mr. Thos. Mawson, lecturer in the Department of City Planning of Liverpool University, will deliver a series of lectures on Town Planning under the auspices of the University of Toronto, at some time during the coming winter session.

Mr. J. P. A. Laforest has received the appointment as Hull City Engineer, replacing Mr. D. Chene, who resigned a few months ago. Mr. Laforest was formerly assistant to the Montreal city engineer and has had considerable experience in corporation work.

Mr. W. F. Evans, chief engineer of Steel & Radiation, Limited, Toronto, has left the city to engage with G. W. T. Nicholson & Company, of Montreal. Mr. Evans was tendered a dinner by a number of his friends at the Engineers' Club before his departure.

Upon his departure for British Columbia Mr. K. A. Mackenzie, secretary of the Engineering Alumni Association, was tendered a farewell banquet by the Alumni at the Engineers' Club, Toronto. Mr. Mackenzie has accepted a position with a Vancouver syndicate which is taking over the development of a number of large water power and irrigation projects in British Columbia.

Mr. F. P. Adams has been appointed to succeed Mr. E. B. Jones as city engineer of Chatham, Ont. Mr. Adams has had considerable experience in municipal work in Brantford and has until recently been engaged in superintending the construction of a large sewage system in Steelton and Sault Ste. Marie. He has also had considerable experience in the installation and operation of [illegible] plants.

Trade Notes and Items of Interest

Some 2,000 men are at present employed on civic works in Calgary, the last semi-monthly pay roll reaching $82,000.

Canada's industrial expansion continues unabated, the estimated value of production for 1910 being $1,000,000,000.

A by-law will be submitted in September in Galt for raising $10,000 for the purposes of improving the system of waterworks.

The eleventh annual convention of the Union of Canadian Municipalities will be held at Quebec on August 29th, 30th and 31st.

The Western Pavers, Limited, have secured the contract for building over 32,000 linear feet of curb and gutter work in Regina.

The building operations in Saskatoon show an issue of 503 permits for the first seven months of the year, representing over $3,000,000.

The city of Toronto has awarded to Q. E. Seagrave, Walkerville, Ont., the contract for motor driven combination chemical engine and fire hose.

The Thunder Bay Construction Company have sub-let a contract for 1,200 feet of breakwater at Port Arthur to M. J. Hogan, of Port Colborne, Ont.

Messrs. Chapman & McGiffin are the architects for a ten-storey building of reinforced concrete to be built for the R. S. Williams & Sons Company, Toronto.

The Niagara Falls Contracting Company, Limited, of Niagara Falls, Ont., was recently incorporated with a capital of $40,000, to carry on a building and contracting business.

The excessive labor troubles that England has been experiencing during the past several weeks, are in danger of seriously affecting foreign trade, according to a recent report from Liverpool.

The city of Boston is contemplating a high pressure installation in its water system. Mr. J. H. Innes, chief waterworks engineer of that city, went over the Toronto plant recently on a tour of investigation.

The contract for the construction of 338,640 feet of concrete sidewalk for the city of Regina has been let to the Parsons Construction Company of that city. Future extensions are at present being planned.

The city council of Calgary has decided to widen all the thoroughfares in the business districts of the city. A by-law will be passed prohibiting the construction of buildings within five feet of the street line.

Messrs. John W. McManus & Company are the successful contractors for the reservoir dam that is being constructed by the city of Moncton, N.B. The dam is to be fifty feet high and will attain a length of over 800 feet.

A schedule of waterworks extensions for the city of Calgary has been drawn up totalling about thirty miles of new mains, of which as much as possible will be laid this fall and the remainder completed next summer.

An asylum for the insane for the province of Saskatchewan is to be erected about two miles from North Battleford. The building will be of pressed brick, three storeys in height. Grounds of considerable area have been set apart here for the institution.

Lemoine & Company, Montreal, have secured the contract for the erection of the Richileau River bridge at St. Johns, Que., and will commence the construction in a few days. The structure will be of reinforced concrete with concrete foundation and piers.

The excavation for the new million dollar Canadian Pacific Hotel which is to be erected in Calgary has been commenced, and concrete work in the basement and foundation, and also on the west wing extension of the station will be in progress in a short time.

Messrs. Laurie & Lamb, of Montreal, were awarded the contract for the construction of an incinerator of the Heenan-Froud type. The plant will consist of a 75-ton per 24 hours top feed unit, together with a 6-cell refuse destructor, and will be installed for the sum of $34,650.

Three tenders have been received for the construction of the dry dock and harbor works at Courtenay Bay, St. John, N.B. These are Norton Griffith, Limited, of London, Sir John Jackson, of London, and a third from an American firm. Each tender was accompanied by a deposit of $500,000.

The plans for the town of North Toronto sewage disposal works are in progress. Construction of the three separate disposal works will be let in one contract and will include construction of the screening chambers, sedimentation tanks and filter beds, together with laying the inlet and effluent mains, etc.

The announcement is made that the annual convention of The Canadian Manufacturers' Association which was to have been held from September 19 to 21 has been postponed on account of elections to October 10. It will be held in Toronto instead of Ottawa as originally planned, but Ottawa will get the convention next year.

A Canadian section of the International Waterways Commission has recently been appointed and consists of Sir George Gibbons, Toronto, Aime Geoffrion, K.C., Montreal, and A. P. Barnhill, St. John, N.B. Three members will also be appointed by the United States. The Commission will have jurisdiction over all matters relating to the international waterways of the two countries.

The imports of Portland cement into Canada, which previous to 1904 were larger than the Canadian production, have been steadily decreasing, and amounted in 1909 to only 142,194 barrels, or about three per cent. of the consumption, as compared with imports of 469,049 barrels, or 15 per cent. of the consumption in 1908. A duty of 12½ cents per hundredweight, equivalent to 43¾ cents per barrel of 350 pounds net is levied on imports.

The field staff of the provincial board of health, after conducting a careful and lengthy examination of the water of the Back River under Mr. H. H. McCready has reported that the water of the river, which is nearly all Ottawa River water, is unfit for human consumption in an unfiltered state. The greatest degree of impurity was found between Cartierville and Bordeaux where all the samples taken showed the presence of bacteria varying from 200 to 2,200 per c.c.

In reviewing the brick industry of Ontario, the Director of the Bureau of Mines states:

"There has of late years been a marked improvement in the quality of brick made in first-class yards. Kilns of modern construction burn harder and more evenly, and there is a smaller proportion of soft brick. The present taste in brick houses, too, does not demand the same uniformity of color that was formerly insisted upon; in fact, a variety of shade, instead of being objected to, is rather desired. There is also a much greater range of products than was made years ago. From white and buff to cherry red, and up to a dark even purplish hue, bricks of all tints and shades are freely used, and pleasing effects are sometimes obtained by employing clinker or overburned bricks, greenish or yellowish in color."

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is nvited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Biggar, Sask.

The ratepayers will be asked to vote $22,000 for waterworks and sidewalks.

Barnet, B. C.

Waterworks, $15,000. At a meeting of Burnaby Council a plan for water system at Barnet was adopted and the engineer authorized to proceed with the work. Lap-welded. Work will start at once.

Fergus, Ont.

Contemplated purchase of machinery. Purchaser, Wellington County. County clerk, James Beattie, Fergus, Ont. One complete set of road machinery including steam roller is now owned by the county. It is proposed to purchase a duplicate set of road machinery.

Hamilton, Ont.

Materials required for reservoir walls. (High Level reservoir). Owner, City of Hamilton; city clerk, S. H. Kent; city engineer, A. F. Macallum. Cement and reinforcing required for concrete wall.

Work authorized for pipe sewers. The City Engineer has been authorized by Council to proceed with the following (cost being estimated "per lineal foot") —Fairview avenue (Cannon street to Highland avenue) $1.48. Lorne avenue (Central avenue to Cumberland avenue) 86 cents. Fairview avenue (Highland avenue to King street) $1.46. Barnesdale avenue (King street to Dunsmure avenue) 90 cents. Madison avenue from end of sewer north of Cannon northerly to end of street, 98 cents. Niagara st. (Ship street to Land street) 65 cents. Niagara street (Gilkison street to Land street) $1.19. Wentworth street (Mars avenue to Gilkison street) $1.31 Scott avenue (Beechwood avenue to Barton street) $1.60. Scott avenue (Beechwood avenue to Rosemount avenue) $1.35. Rosemount avenue (Sherman avenue to Scott avenue) 75 cents. Beechwood avenue (Sherman avenue to Scott avenue) $1.00. Campbell avenue Frederick avenue to Ottawa street) $3.25. Wentworth street (Gilkison street to Land street) $1.75.

Plans to be prepared for sewage disposal plant. Owner, City of Hamilton, Ont. ,S. H. Kent, City Clerk. City Engineer, A. F. Macallum. City Engineer will prepare plans.

Tenders to be called for grading and sidewalks. J. Walter Gage, Main and Hughson streets, will do following work —lay out and grade two streets on part of lot 9, concession 2, Barton township and lay 4 ft. 6 in. cement sidewalk and curb on following properties:—Eastholme Survey about 1839 lin. ft. Delta Survey about 2408 lin. ft. Crow Point Extension about 2695 lin. ft. Work will be done under supervision of City Engineer Macallum, who supplies grades and specifications. Tenders to be called shortly.

City Engineer Macallum will construct the following water mains:—High Garth to Beulah, $476. Brant, Wentworth to Niagara streets, $431. Park Row avenue, Columbia to Edinburgh avenue, $578. Burton street, Douglas to Wentworth street, $1092. Douglas st., Mars avenue to Francis, $275. Oliver street, Wentworth to Wilfred, $868. Gilkison street, Wentworth street, 600 ft. westerly, $827. Mayflower, Trolley street to Glendale avenue, $929. Magnolia street, King to Sherbrooke street, $1126. Wilson street, Madison avenue, to Wentworth street, $530. Boyleston avenue, Barton street to Primrose avenue, $1162. Trolley street, Barton st. to G. T. R. $1372. Hilda avenue, Main street to King, $830.

Haileybury, Ont.

On August 28th the ratepayers will pass on a by-law to raise $15,000 for waterworks.

Kindersley, Sask.

Grading contemplated for street. Owner, Town of Kindersley. Secretary. J. D. McLeod. Grading about to commence on four miles of street. Town would prefer to do it by contract but may undertake work. No equipment on hand.

Lansdowne, Ont.

Tenders called for cement walks. Owner, Municipality of Lansdowne. Clerk, J. D. W. Darling. Building of cement walks on Railway avenue and Gilbert streets. Tenders to state price (1) Furnishing all the material and doing the work. (2) To do the work, the material to be furnished by the Corporation. Specifications at the office of the clerk. Tenders were received by the clerk until noon August 21st.

MaGrath, Alta.

Tenders called for cement sidewalks. Owner, Town of Magrath. Secretary-Treasurer, Melvin Godfrey. Specifications with the secretary. Tenders to be accompanied by accepted cheque for 5 per cent. of amount of tender. Tenders received by secretary until 6 o'clock Aug. 26th.

Moncton. N. B.

Tenders called for sewerage. Owner, City of Moncton, N. B. City Clerk, T. S. Magee. City Engineer, John Edington. Extension of sewer on High street N. 800 ft. Victoria Square 700 ft. Extension of sewer on St. George street, 375 ft. Plans with City Engineer. Tenders received by City Clerk until Aug. 17th. Tenders to be accompanied by cheque [illegible] of amount of tender.

Menard Corner, Que.

Purchase contemplated for stone crusher. Contractor [illegible] Menard Corner. Contract calls for [illegible] tons of crushed stone, at $2.35 per ton for completion of public road along Chambly Canal for Federal Government. One crusher has been purchased —an additional one may be required.

North Vancouver, B.C.

Tenders called for sewer. City engineer, G. S. Hanes. Supply of material and construction of sewer with connections on Esplanade and Crescent st., from St. George avenue to St. David's avenue and on Second street from a point 30 ft. E. of St. Andrews to St. David's avenues. · Tenders received by city clerk until August 21st.

Port Hope, Ont.

By-law carried for waterworks extension. Owner, Town of Port Houe. Ont. Town clerk, J. W. Sanders. By-law passed by council to issue debentures for $15,000; cost to be divided as follows:—mains, $6,000; instal eight more hydrants, $400; 150 water meters, $2,000; change the pumping system from steam to electricity, $4,000; build a filtering gallery, $2,000 and a well to cost $2,500.

Pincher Creek, Alta.

Plans prepared for sewerage. Engineer, Wood & Stelle, Pincher Creek, Alta. Wood & Stelle have been asked to prepare plans for sewerage system for the town. Part of system will be installed this year.

Saskatoon, Sask.

A by-law will be submitted on August 23 for the raising of $10,000 for the improvement of Saskatchewan Drive and Victoria avenue.

A by-law will be submitted on August 23rd for the raising of $45,000 for house sewer and water connections.

A by-law will be submitted on August 25, for the raising of $73,000 for extensions of the waterworks system.

Ste. Anne de Bellevue, Que.

Tenders were called on the 14th for a system of drainage and also for the installation of an electric light system and waterworks for the town of Ste. Anne de Bellevue. V. H. Dupont, 62 St. James street, Montreal.

St. Mary's, Ont.

W. S. Brooke, Toronto, has plans prepared for a sewer system and a sewer disposal plant, estimated cost $201,500.

Township West Oxford, Ont.

Tenders called for drain improvement. (Lot 6, con 4). Owner, Township of West Oxford, Ont. Township Clerk, Bryan Lowry, Ingersoll. Specifications, etc., at office of the Clerk. Tenders received by clerk, until noon, Aug. 19th.

Town of Blandford, Ont.

Tenders called for drain. Owner, Township of Blandford, Ont. Clerk, W. J. Henderson, Bright, Ont. Engineer, F. J. Ure, Woodstock. Skilling Drain, 2,210 ft. 5 in. to 10 in. tile, 117 ft. 6 in.

tile and 36 rods open ditch. Hersee drain, 3,700 ft. 9 in. and 10 in. tile and 12 rods open ditch. Chesney drain, 3,040 ft. 10 in. and 12 in. Plans, etc., at office of F. J. Ure, Wodstock, and at the clerk's office, Bright. Tenders received by clerk until 12 o'clock, August 28th.

Toronto, Ont.
Tenders called for laying a six-foot steel conduit. Owner, Board of Control; chairman, G. R. Geary, Mayor. Laying a 6-ft. steel conduit from a connection with the present intake southerly into Lake Ontario, a distance of 500 ft., including all connections. Plans, etc., with the Waterworks Department at the office of the City Engineer. Tenders received by Chairman until Aug. 23rd.

Toronto, Ont.
Municipal work. Board of Works recommended construction of asphalt macadam roadway (60 to 130 ft.) concrete curbing and gutters on University avenue, from Queen street to a point 261 ft. N. of College. Probable cost, $85,987 Proposed extension of Terauley street north of Bloor deferred until after Jan. when the ratepayers vote on proposed tube. Macadam roadway to be laid on St. Vincent street. Action deferred on widening of Dufferin street from King to Exhibition grounds. Matter like to be brought up at council. Plans for G. T. R. bridge awaiting decision regerding widening.

Point Grey, B. C.
Sidewalks, etc. Owner, Corporation of Point Grey. Secretary-treas., H. Floyd. Tenders to be called for cement sidewalks on several streets; a road sprinkler to be purchased; a committee appointed to confer with regard to installation of sewerage system in D. L. 472.

Plantagenet, Ont.
The council is considering the construction of concrete sidewalks here.

CONTRACTS AWARDED

Dresden, Ont.
Waterworks pipe. Owner, Corporation of Dresden, town clerk, J. T. Bridgewater; consulting engineer, F. W. Farncomb, C.E., 64 Bank of Toronto Chambers, London. Successful contractor, United States Iron Pipe and Foundry Co., Buffalo, about 15,000 feet of 4-in., 6-in. x 8-in. c.i. waterworks pipe at $30.35 per ton. f.o.b. cars Dresden.

Edmonton, Alta.
The contract has been awarded to the Moran Co., of Seattle, Wash., for a 6,000,000 gallon steam-driven centrifugal pump. Cost, $18,000.

Hamilton, Ont.
Sewers. Owner, City of Hamilton; S. H. Kent, City Clerk. City Engineer, A. E. McCallum. Contractors, S. Cheeseman, King and Dundurn, pipe sewer, Sherman avenue, from Main street to Maple avenue, at $1.25 per lineal foot. J. J. Armstrong, 48 Burris street, pipe sewer, Greenaway avenue, from Wilson street to Cannon street, at 78 cents per lineal foot.

Moncton, N. B.
Reservoir dam. Owner, City of Moncton. Engineer, John Edington, Moncton. Successful contractor, John W. McManus & Co., Moncton. $128,542 dam 50 feet high, 800 ft. long. Others tendered as high as $146,326 and $156,364. Contract was awarded August 11th.

North Bay, Ont.
Waterworks. Engineer in charge, J. H. Shaw, North Bay. Successful contractors, Stewart & Co., N. Bay, laying 15,500 ft. 14 in. wood pipe, $6,500; C. Landrelli & Co., N. Bay, 2,550 ft. 10 in., 27,745 ft. 6 in. and 1,110 ft. 4 in. pipe, $16,000. Contract awarded Aug. 7th.

Revelstoke, B.C.
Pipe line. Owner, City of Revelstoke. General contractors, Pacific Coast Pipe Co., Vancouver, $8,500; other tenderer, MacCarthy & Kennedy, Revelstoke, $16,000. Construction of 1,100 feet of 6 ft. pipe line.

Regina, Sask.
Sidewalk construction, $56,647. Owner, City of Regina. City Engineer, L. A. Thornton. Contractor, Parsons Construction Co., Regina. Material required, cement. Construction of about 338,640 ft. of concrete sidewalk. An additional programme of sidewalk extension to be drawn up by fall. Contract awarded Aug. 7th. By-laws passed by council.

Curb and gutter, $23,603. Owner, City of Regina. City Engineer, L. A. Thornton. Contractor, Western Pavers, Ltd., Regina. Construction of about 32,334 lin. ft. of curb and gutter. Material required, cement. Contract awarded Aug. 7th. By-law passed by council.

Vancouver, B.C.
The contract for laying about 1,400 ft. of 6-in. c.i. pipe across the arm of the Fraser between Lulu and Sea Islands has been awarded to the Municipal Construction Company, 319 Pender street.

Railroads, Bridges and Wharves

Chatham, Ont.
Tenders called for concrete abutments, Baptiste Creek. City engineer, Geo. A. McCubbin, King street, Chatham; county clerk, J. Gosnell, Chatham. Construction of reinforced concrete abutments and repairing superstructure of Baptiste Creek Bridge on the Kent & Essex Co. line. Plans, etc., at office of engineer. Tenders to be accompanied by accepted cheque for $200. Tenders received by county clerk until noon, August 26th.

Calgary, Alta.
Tenders called for bridges. (Crow's Nest Sub-division). Owner, Canadian Pacific Railway. Division Engineer, N. E. Brooks, Calgary. Construction of concrete sub-substructure for bridges, 53.7 and 65.6. Plans, etc., at Asst. Chief Engineer's office, Winnipeg, or Division Engineer's office, Calgary. Tenders received until noon Aug. 25th.

Under consideration, extension of street railway. Owner, City of Calgary. City Engineer, J. T. Child. The commissioners have under consideration extensions as far as Manchester sub-division, two industries having located there. A clause in the agreement given industries locating in industrial sub-divisions stated that extensions would be made. Such extension will involve construction of an overhead bridge across C. N. R. Cost for this has been undertaken by company.

Dartmouth, N. S.
Tenders called for railway. Owner, Department of Railways and Canals, Ottawa. Secretary, L. K. Jones. Branch line from Dartmouth of Deans. Plans, etc., at office of Chief Engineer of Department; at office of chief engineer, Intercolonial Railway, Moncton, office of Board of Trade, Halifax. Tenders received by secretary until 6 o'clock Sept. 15th. Advertisement in "Tenders and For Sale Department" of this issue.

Feltzen South, N.S.
Tenders called for breakwater, Lunenburg Co. Owner, Department of Public Works, Ottawa; secretary, R. C. Desrochers. Plans, etc., at Department and at the offices of district engineer, Halifax, N.S.; district engineer, Antigonish, N.S., and on application to the local postmaster. Tenders received by secretary until 4 p.m., September 6th.

French River, N.S.
Tenders called for breakwater. (Victoria Co.) Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers. Construction of breakwater. Plans, etc., at Department and at the offices of District Engineer, Antigonish, N. S., District Engineer, Halifax, N. S., and on application to the Postmaster at Breton Cove, North Shore, Victoria County, N. S. Tenders received by secretary until Sept. 6th.

Fort William ,Que.
Tenders called for wharf. Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers; construction of public wharf at Fort William, Pontiac County, Que. Plans, etc., at Department and at offices of the postmasters at Pembroke, Ont., and Fort William, Que. Tenders to be accompanied by accepted cheque for 10 per cent. of amount of tender. Tenders received by secretary until 4 p.m. Aug. 28.

Guysborough, N. S.
Tenders called for railway. (To Sunny Brae). Owner, Department of Railways and Canals, Ottawa. Secretary, L. K. Jones. Branch line through County Harbor crossroads with extension to deep water of County Harbor. Plans, etc., at offices of Chief Engineer's Department, Ottawa. Chief Engineer, Intercolonial Railway, Moncton, Board of Trade, Halifax. Tenders received by secretary until Sept. 15th. Advertisement in "Tenders and For Sale Department" of this issue.

Kelley's Cove, N.S.
Tenders called for extension to breakwater. (Yarmouth Co.) Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers. Construction of extension. Plans, etc., at offices of District engineer, Halifax, N. S. District Engineer, Antigonish, N. S., on application to the local Postmaster. Tenders received by Secretary until 4 p.m. Sept. 12th.

Montreal, Que.
Terminal facilities. Owner, Canadian Pacific Railway. Buildings about to be erected: 24-stall engine house; a machine shop; a mechanical coaling plant; a stores building; a boarding house to lodge 100 men; capacity of yards increased to 1,700 cars. Work to be finished this year.

Newmarket, Ont.
Tenders called for bridge over Holland river. Owner, Town of Newmar-

ket; engineer, Frank Barber, C.E., 57 Adelaide street east, Toronto. Construction of concrete abutments and reinforced concrete, truss bridge. Tenders received until noon, August 26th

Oromocto Shoals, N. B.

Tenders for dredging. Owner, Dept. of Public Works, Ottawa. Secretary, R. C. Desrochers. Specifications on application to secretary. Tenders received until 4 p.m. Aug. 21st.

Ste. Pierre Aux Liens, Que.

Tenders called for bridge. Owner, Department of Railways and Canals, Ottawa. Secretary, L. K. Jones. Substructure of Bascule Bridge at St. Pierre Aux Liens. Plans, etc., at office of the chief engineer of the Department of Railways and Canals, Ottawa and at the office of the Superintendent Engineer of Quebec Canals, 2 Place d'Armes, Montreal. Accepted cheque for $1,000 to accompany each tender. Tenders received by secretary until 6 o'clock, Aug. 25th.

Rainy River, Ont.

The Canadian Northern Railway is to make extensive alterations and additions at this point, including a new brick station.

St. John, N.B.

Bids received for harbor and dry dock, Courtenay Bay. Owner, Department of Public Works, Ottawa. Construction of wharves, breakwater and dry dock. Those who tendered: Sir John Jackson, Ltd.; Sir Weatman Pearson, Ltd., and Norton-Griffiths, Limited. Tenders being considered.

Tupperville, Ont.

Tenders called for bridge, Maxwell Outlet Dredge Cut. Owner, Tps. of Chatham and Dover. Commissioner, A. J. Templeton. Construction of five wood and steel bridges. Plans, etc., at office of Tp. Clerk, Scane Block, King street, Chatham, on any Saturday; or at any time at the clerk's office in Tupperville.

Thessalon, Ont.

Tenders called for breakwater. Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers, Ottawa. Construction of a breakwater at Thessalon, District of Algoma. Plans, etc., at the department and at the offices of J. G. Sing, District Engineer, Confederation Life Bldg., Toronto. H. G. Lamb, District Engineer, London, and on application to the Postmaster, Thessalon. Tenders to be accompanied by accepted cheque for 10 per cent of tenders. Tenders received by secretary until 4 p. m. Sept. 11th.

Vancouver, B.C.

Equipment required for bridges. (Mission and Westminster Jcts.) Owner, Canadian Pacific Railway. Successful contractor, Mueller & Taylor, 407 Hastings W. Vancouver. 13 bridges of concrete, 8 culverts, one arch, concrete abutments for four bridges, two 30 ft. and two 4-ft. spans. Railroads furnish sand, gravel and cement. Contractors in the market for reinforcing steel, timber, etc. A complete camp outfit is required and tenders for pile drivers will be called immediately.

The government will commence the construction of a pile, bent bridge across Lynn Creek on Third street, next week. The spacing of the piles will be about 20 feet, and the bridge will be about 175 feet in length. A large amount of lumber for this work will be required.

Whitehead, Man.

Tenders called for bridge (across Little Saskatchewan River). Owner, Department of Public Works, Winnipeg. Secretary-treasurer, M. Eaton, box 107, Alexander, Man. Plans, etc., at Department and at office of McDiarmid & Clark, Brandon, Man. Double or single span steel bridge; two cement abutments. Tenders received until noon Aug. 25th.

CONTRACTS AWARDED

Fort William, Ont.

Work is under way on the erection of the new government bridge over the Kaministiquia at Slate River. A. Jackson, government contractor, is in charge of the construction work.

Kamloops, B. C.

Railway, from Kamloops to the British Columbia-Alberta line. Owner, Canadian Northern Railway. General contractor, The Northern Construction Co., 406 Union Bank Build, Winnipeg. Sub-contracts will be awarded in a few days.

Moncton, N. B.

Station. Owner, Grand Trunk Pacific Commissioners, Montreal, Que. Dr. C. A. Murray & John A. Lea have been awarded the contract to erect stations and other buildings between Moncton and Beaver Brook, 18 in all. Expenditure about $150,000.

Ottawa, Ont.

Hudson Bay Railroad. Dept. of Railways & Canals. Secretary of Department L. K. Jones. Contractor, J. D. McArthur, 204 McArthur Building, Winnipeg. Contract roughly amounts to $3,000,000. Initial section from Pas Mission to Thickett Portage.

The following contracts for wharves, piers, dredging, etc., have been awarded by the Department of Public Works, Ottawa: Cape Rouge, Inverness Co., N.S., landing pier, Robert Musgrove, contractor, $15,884; Mulgrave, N.S., wharf, Sidney W. Hagerty, contractor, $3,000; Beaumaris, Muskoka, Ont., wharf and approach of stone, Union Construction Co., of Ottawa, Ltd., contractors, $23,994; Labelle County, Que., wharf, Belanger & Co., contractors, Papineauville, Que., $6,399; Dipper Harbor, N.B., dredging, James S. Gregory, contractor, of St. John, N.B., 65c. per cubic yard. River St. Francis, Que., dredging, contractors, Trewe Bastien, Jas. Laurin, W. C. Leitch, of Montreal; St. Pierre les Becquets, Que., dredging, contractors, the W. J. Poupore Company, Ltd., of Montreal, P.Q.; Berthierville, Que., dredging, contractors, the W. J. Poupore Company, Ltd., of Montreal, P.Q.; Batiscan River, Que., dredging, contractors, the W. J. Poupore Co., Ltd., of Montreal, P.Q.; St. Maurice River, Que., dredging, contractors, the W. J. Poupore Company, Limited, of Montreal, P.Q.; Nicolet River, Que., dredging, contractors, L. Cohen & Son, of Montreal; Midland, Ont., dredging, contractors, Canadian Dredging Company, Limited, of Midland, Ont.

St. Johns, Que.

Bridge, $154,000 (Richelieu River). Owner, Municipalities of St. John and Iberville. Contractors, Lemoine & Co., 262 Park Lafontaine, Montreal, Que. Reinforced concrete. ½ mile in width Foundation, concrete piers. Work to commence soon and to be completed October, 1912.

Smith's Falls, Ont.

Rene A. Girouard, Smith's Falls, is reported to have secured contract for construction of a section of the Canadian Northern Railway from Jones' Locks, Smith's Falls, to Otter Lake, a distance of nine miles.

Vancouver, B.C.

L. M. Rice & Co., contractors for the construction of 40 miles of the Kettle Valley line from Bull Creek to Summit, have begun construction on the line from Summit to Penticton, a distance of 35 miles The section from Midway to Bull Creek is graded and 20 miles of track has been laid.

Vernon, B. C.

Station. Owner, Canadian Pacific Railway. Division Engineer, H. Rindall, Vancouver. Successful contractor, T. E. Crowell, Vernon. Work will commence at once.

Public Buildings, Churches, Schools, etc.

Brantford, Ont.

Excavation tenders called for Y. M. C. A., $100,000, Queen and Darling sts. Owner, Y. M. C. A., Brantford, Ont.; architect, Burke, Horwood & White, 28 Toronto street, Toronto; associate architect, L. D. Barber, Temple Bldg., Brantford. Excavation work on the new Y. M. C. A. building. Plans, etc., at office of L. D. Barber. Tenders received until noon, August 21st by secretary Y. M. C. A., Brantford.

Bacarres, Sask.

Tenders called for school. (S. D. No. 87). Owner, Board of Eductation. Secretary, Robert McMillan. Plans, etc., at office of W. Penny Balcarres. Tenders closed August 16th.

Clinton, Ont.

Contemplated addition to school. Owner, Collegiate Institute Board. Secretary, J. W. Treleaven, Clinton, Ont. An addition to the Collegiate Institute is to be erected.

County of Wellington, Ont.

The County of Wellington has now under construction a new gaol and gaoler's residence, and within the next year or two it is intended to completely renovate the court house, or build a new building. Apply to James Beattie, county clerk.

Delisle, Sask.

Tenders called for school. (No. 305 Frontenac). Owner, Frontenac School District No. 305. Secretary, C. D. Miller. Erection of school. Dimensions of school 24 x 36 x 10. Tenders received by secretary until Aug. 21st.

Dresden, Ont.

Tenders called for interior fittings for Post Office. Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers. Plans, etc., with the postmaster at Dresden. Mr. T. Hastings, Clerk of Works, Postal Station F., Toronto, and at the Department of Public Work, Ottawa. Tender to be accompanied by an accepted cheque for 10 per cent. of amount of tender. Tender received by secretary until 4 p.m. Aug. 29th.

Edmonton, Alta.

Lease of building site for theatre, $55,000 (Jasper avenue). Interested parties, N. Manasse and Dr. J. W. [illegible]

[illegible] Red Deer. 2 storey, brick with stone trimmings. Cost of building apart from equipment, $35,000. 36 offices in [illegible] floor. Construction will commence on expiration of lease in May 1912.

Flinton, Ont.

The coroporation of Flinton are contemplating the erection of a Town Hall in the near future. Moses Lessard, Flinton, Ont., Clerk.

Holland Island, Chatham Sound, B. C.

Tenders called for wooden lighthouse and dwelling. Owner, Department of Marine and Fisheries, Ottawa. Deputy Minister, A. Johnston. Construction of a wooden lighthouse and dwelling combined on a concrete pier and protection work on Holland Island, Chatham Sound, B. C. Plans, etc. at the department, Ottawa, at the agency of Department, Victoria, and at are Post Office, Vancouver, B. C. Tenders received by Deputy Minister until noon Sept. 8th.

Hazeldean, Ont.

Work has commenced on a new school house for S. S. No. 13, cost $2,800. Debentures not yet sold. Clerk, J. F. Cummins.

Kindersley, Sask.

Plans invited for school. (S. D. No. 2628). Owner, Board of Education. Acting secretary, J. D. McLeod, Kinderley. 4 rooms with full basement, auditoriums on second floor. School when completed in every detail to cost not more than $25,000. Plans were received until Aug. 22nd. For further information apply to secretary.
for enlargement. Plans received until Aug. 22nd. For further information apply to secretary.

Kingston, Ont.

Tenders called for school. Owner, Governor's School of Mining, Kingston, Ont. Architect, Power & Son, Merchant's Bank Building, Kingston, for cabinet work, comprising tables, benches, fume cupboards, plumbing and fitters work for Nicholas Building. Plans, etc., at office of architects. Tenders received by secretary, School of Mining, until 3 p.m. Sept. 1st. Advertisement in "Tenders and For Sale Department" of this issue.

Man of War Point, N. S.

Tenders called for lighthouse tower. (Cape Breton Co.) Owner, Department of Marine and Fisheries, Ottawa. Deputy Minister, A. Johnston. Construction of a wooden lighthouse tower at Man of War Point, Bras d'or Lakes. Plans, etc., at the Department, Ottawa, at the Agency, Halifax, and at the Post Office, Sydney, North Sydney, Baddeck, and Whycocomagh. Tenders received by the Deputy Minister until noon, September 5th.

Maisonneuve, Que.

Tenders to be called for post office, $60,000. (Ontario street). Architect, C. A. Reeves, 58 St. James street, Montreal, Que. Stone and steel on concrete foundations. Floors, terra cotta and mosaic; fireproof. Tenders will be called by architect in a few days.

New Westminster, B.C.

A site of three acres has been chosen just west of the town for the new Cloverdale school. Plans are now being prepared. $17,000 has been secured.

North Vancouver, B. C.

Competitive plans called for church, $18,000. Owner, St. Andrews Presbyterian church. Seating capacity, 800, building to include Sunday School room and kitchen. Tenders for competitive plans must be in by Sept. 2nd.

New Westminster, B.C.

The Edmonds Club are contemplating the erection of a club house at a cost of about $10,000.

Ottawa, Ont.

Tenders called for supply of lanterns. Owner, Department of Marine and Fisheries, Ottawa. Deputy Minister, A. Johnston. Supply of four third order ten-foot iron lanterns for lighthouses. Plans, etc., with the purchasing agent, Department of Marine and Fisheries, Ottawa, and from the agencies at St John and Halifax. Each tender to be accompanied by accepted cheque for $500. Tenders received by Deputy Minister until 12 o'clock, September 5th.

Red Deer, Alta.

Work in progress for ladies college, $75,000. Owner, Presbyterian Church of Canada. Architect, C. A. Julian Sharman, Red Deer. A large concrete basement for the college will be constructed this fall.

Work in progress for parish hall. Owner, Anglican Church of Canada. Secretary of Building Committee, J. W. Hey, Red Deer. A large concrete basement for Parish Hall will be built and roofed over this fall.

Strathroy, Ont.

The council will likely ask the ratepayers to endorse an expenditure of $35,000 for a new school.

Sherbrooke, Que.

Tenders called for academy. Owner, Catholic School Commission, Sherbrooke. Architect, J. W. Gregorie, Sherbrooke. Construction of an academy in the South Ward. Plans, etc., at office of architect. Tenders received by architects until Aug. 22nd.

St. Vital, Man.

Specifications prepared for municipal hall. Owner, Municipality of St. Vital. Architects, Hooper & Hooper, 303 McIntyre Building, Winnipeg. 2 storey, brick veneer, stone foundation, cement work, steam heating, electric lighting, shingle roof.

Tenders called for electrical supplies. Owner, Department of Public Works, Winnipeg. Minister of Public Works, R. Rogers. Wiring and supplies required at the Dormitory Building. Agriculture College, St. Vital. Plans, etc., at office of the Provincial Architect, Fort Garry Court, Winnipeg. Each tender to be accompanied by accepted cheque for 5 per cent. of amount of tender. Tenders were received by Minister of Public Works, until noon August 19.

St. John's, Que.

Equipment required for college. Supervisor of construction, Rev. A. Papineau, St. John's, N.S. A building is being fitted up for the present to be ready by September. Sanitary ware, hot water, furnaces and piping; iron seats, electroliers, furniture, etc. Alf. Beaudry, St. John's, is the electrician; J. F. Mayrand is in charge of plumbing.

Sherbrooke, Que.

Tenders called for erection of a school. (South Ward). Owner, Catholic School Commission. Architect, J. W. Gregorie, Sherbrooke, Que. 3 storeys, brick and stone, stone, steel beams foundation, cement work, brick, electric work, electric lighting. Tenders received until Aug. 22nd.

Toronto, Ont.

Tenders called for purchase and removal of fire hall. (Main street E., East Toronto). Owner, City of Toronto. City Architect, R. McCallum, City Hall, Toronto. Purchase and complete removal of the old fire hall on Main st., E., Toronto. Deposit of 5 per cent. of offer to accompany each tender. Entire work to be completed before the 2nd of September, 1911. Full information with architect. Tenders received by architect until Aug. 18th.

Tenders called for library shelving and fittings. Owner, Department of Public Works, Ontario. Secretary, H. W. McNaughten. Library metal shelving and fittings, required in connection with the library addition to the Ontario Government Buildings, Queens Park, Toronto. Plans, etc., at the offices of Geo. W. Gouinlock, architect, 1108 Temple Bldg. Toronto. Tenders to be accompanied by accepted cheque for 5 per cent. of amount of tender. Tenders received by secretary until noon, Sept. 5th. Advertisement in "Tenders and For Sale Department" of this issue.

Plans in progress for hospital. (Humber River, near Weston). Owner, National Sanitorium Association, 347 King street W., Toronto. Architect, A. R. Denison & Stephenson, 20 King st. W., Toronto. 2 storeys, brick, stone and concrete. New Main building to take place of one recently burned. Fireproof construction.

Ottawa, Ont.

Tenders called for fittings for post office department. (Langevin Block). Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers. Fittings for Post Office Department in the Langevin Block, Ottawa. Plans, etc., at Department. Each tender to be accompanied by accepted cheque for 10 per cent. om amount of tender. Tenders received by secretary until 4 p.m. Aug. 21, 1911.

Hardiville ,Alta.

Tenders called for school. (No. 6). Owner, Board of School Trustees. Secretary, C. H. Bowman. Erection of a frame school building. Plans, etc., at office of secretary in the Acadia Building. Each tender to be accompanied by accepted cheque for 10 per cent. of amount of tender. Tenders received by secretary until noon Aug. 25, 1911.

Saskatoon, Sask.

Tenders are called until the 16th for the erection of a frame school, house, 20 x 30, together with stable, 16 x 24, for the Bergheim School District No. 2819, Saskatoon. A. C. Traukum, sec.-treas., Box 1552, Saskatoon.

Victoria, B.C.

The Chinese Young Men's Progressive party are asking for aid to build a Chinese library.

Reported purchase of church. (Quedra and North Park streets). Purchaser, First Presbyterian Church. Pastor, John Campbell, M.A., Ph. D. The present site of Church has been sold for about $80,000, and a new site purchased on Quadra street. Nothing more definite can be learned.

Vancouver, B. C.

Tenders to be called for addition to church, $8,000. (Jacksan and Pender streets). Owner, Baptist Congregation. Supt. of Work, J. G. Price, 614 Holden Building, Vancouver. Tenders to be called on minor contracts at once.

Winnipeg, Man.

Tenders called for painting and heating. (No. 1 Fire station). Owner, Bd. of Control. Secretary, M. Peterson. Supply of labor and material required in painting 3 chemical fire engines and also installation of heating system for No. 1 fire station. Tenders received by Chairman Board of Control until 11 a. m. August 24th.

Weyburn, Sask.

Tenders called for public building. Owners, Department of Public Works, Ottawa; secretary, R. C. Desrochers. Construction of public building. Plans, etc., at office of Mr. J. E. Cyr, Superintendent of Public Buildings for Manitoba, Post Office Bldg., Winnipeg, Man., at local post office and at Department. Tenders received by secretary until 4 p.m. September 5th.

Winnipeg, Man.

Tenders called for school equipment. (Technical High Schools). Commissioner of School Buildings, J. B. Mitchell. Students Physics tables; Analytical tables; teachers tables; stools, stools clamped to floor (curved back); gas cupboard, 11 ft. long; Biological students' benches; individual Chemistry tables; wallcases—1, 12 ft. long; 1, 14 ft. long. 2, 10 ft. long; 1 apparatus case, 10 ft. 6 in. long, and 7 ft. 6 in. high. Glass used must be 32 oz. British manufacture. Delivery within 60 days from date of acceptance. The school board reserves the right to order only part of the goods from one firm. Prices must include all charges to place article in position they are to occupy in the building. Door openings into rooms, 2 ft. 6 in. x 6 ft. 10 in. For plans, etc., write J. B. Mitchell, architect. Tenders received by R. H. Smith, Secy.-treas., Public School Board, until 5 p.m. August 25th.

CONTRACTS AWARDED

Hamilton, Ont.

Church, $12,000. (Barton street E.) Owner, Roman Catholic Diocese of Hamilton. Mgr. Mahoney, Dean. Architect, S. A. Wardell, 110 Hunter West. 1 storey, 130 x 57, stone foundation, brick, stone, cement, hot air heating, electric lighting, shingle roofing, cut stone. Contractor, Joseph Stein, Beach Rd., Hamilton. Contract awarded August 11th.

Ottawa, Ont.

The following contracts for public buildings have been awarded by Department of Public Works, Ottawa:—Cranbrook, B.C., public building, McCallum & Co., Cranbrook, at $43,833; Parrsboro, N.S., public building, Falconer & MacDonald, of Halifax, builders, $26,900; Rideau Hall, cottages, August Boehmer, contractor, Ottawa, $7,-250; Rideau Hall garage and residence, A. G. Marshall, contractor, $15,100; Wetaskiwin, Alta., public building, Brown Construction Co., Ltd., Winnipeg, $25,650; Rock Island, Que., public building, contractor, N. A. Beach, Georgeville, Que.; Humboldt, Sask., public, the Brown Construction Company, Ltd., Winnipeg, contractors, $37,-673; Kingston, Ont., alterations and additions, McKelvey and Birch, contractors, $49,100; Shawinigan Falls, Que., public building, A. Durand, contractor, $32,860.

Toronto, Ont.

Addition to club house, Kingston rd. Owner, Toronto Hunt Club, East Toronto; architect, Darling & Pearson, Leader Lane, Toronto; general contractor, S. R. Hughes, 79 Portland street, Toronto. Two stys., 24 x 70, frame, lath and stucco, concrete foundation, cement work, metallic lath roofing, sheathing or deafening paper, sheet metal work, asbestos materials, hot water heating, electric light.

Church and Sunday school, $60,000, corner of College and Montrose. Owner, West Presbyterian Church, Toronto; architect, Gordon & Helliwell, Confederation Life Bldg., Toronto; contractors, masonry, J. Aldrich & Son, Shaw street, Toronto; carpentry, A. McCall, 432 Gladstone ave.; iron work, Dominion Bridge Co., Toronto. Other contracts not yet awarded.

The contracts for the additions to Holy Family School, Close avenue, have been awarded as follows: Masonry, John McGlue, 285 Sherbourne st.; carpentry, Maden Bros., 300 Dufferin street; cement, Queen City Paving Co., Toronto; plastering, A. J. Madden, Queen street east; heating, P. J. Hayes, 452 Gladstone avenue; plumbing, J. E. Gray, Toronto; roofing, J. J. Glynn, Arthur street; painting, J. W. Morgan, 210 Parliament street; wiring, Geo. J. Beatty, 109 Victoria street.

The contracts for the additions to St. Anthony's school have been awarded as follows: Masonry, John McGlue, 285 Sherbourne street; carpentry, T. J. Sullivan, 552 Ontario street: cement,Queen City Paving Co., Toronto; plastering, A. J. Madden, Queen street east; heating, Toronto Furnace Co., Toronto; plumbing, J. E. Gray, Toronto; roofing, J. J. Glynn, Arthur street, Toronto; ing, W. J. Phelan, Queen street east; wiring, George J. Beatty, 109 Victoria street.

Victoria, B.C.

Frank D. Woodward, Kamloops, has been awarded the contract for the Long Lake school. Changes are being made in the specifications for the Columbia Gardens school, and the awarding of that contract will be delayed.

Residences

Bowmanville, Ont.

Tenders called for cottage, $3,000. Owner, T. H. Bull, Toronto; architect, Forsey Page, Confederation Life Bldg., concrete foundation, shingle roof. Ten- Toronto, Ont., 1-sty. 30 x 40, frame, ders received until August 24th.

Brantford, Ont.

Tenders called for four dwellings, (Terrace). (Fleet street.) Owner, G. W. Bookman, Brantford. Architect, Taylor & Taylor, Brantford. 2 storeys and basement; 72 x 37, brick, concrete foundation, cement work, telephone system, gas heating, gas and electric lighting, shingle roofing, interior finish pine. Tenders received after Aug. 23rd, until Sept. 4th.

Tenders to be called for residence, $3,000, Egerton street. Owner, Mr. Thos. Elliott, 80 Brant ave., Brantford; architect, L. D. Barber, Brantford. Two stys., 28 x 32, brick, concrete foundation, hot air heating, electric lighting, roofing, shingles on 14-lb. asbestos, interior finish pine, cement work, brick, telephone system, electric bell. Tenders received after August 23, close September 2nd.

Hamilton, Ont.

Residence, $4,500. (Melrose avenue). Owner, R. Laidlaw, 11 Ashley street, Hamilton. Architect, George J. White, 165 Main street E., Hamilton. 2½ storeys, brick and stone, stone foundation, shingle roofing, hot air heating, electric light. Georgia pine finish. Architect will sub let it by day labor.

Halifax, N.S.

Residence, $2,500, Owen street. Owner, J. Kirkwood. Three stys., 31 x 42 x 29, wood, concrete foundation, electric lighting, shingle roofing, cement work, brick, terra cotta, mantels, fireproofing, asbestos materials, pipe covering, sheeting and deafening paper, "asbestos fire stop" to be used. Owner will supervise building.

St. Boniface, Man.

Tenders received for apartment, Marion and Tache streets. Owner, Mrs. H. S. Dick; architects, Jordan & Over, 47 Canada Life Bldg., Winnipeg. Four stys., ordinary brick, stone foundation, steam heating, electric light, felt and gravel roof, oak and fir interior finish. Tenders closed on August 19th. A gasoline vapor lighting and heating plant will be installed but not tendered on.

Sherbrooke, Que.

Tenders to be called for erection of four residences, $10,000. Owner, Fuller & Wiggett (private plan). 2 storeys, brick and stone ,hot air heating, electric lighting. Tenders received after the 25th of August.

Toronto, Ont.

Residence, $3,500. (W. S. Triller avenue.) Owner, D. J. Lynch, 548 Front street W. Architect, J. H. Galloway, 23 Toronto street. 2½ storeys, 21 ft. 6 in. x 33 ft., brick and stone, stone foundation, shingle roofing, cement work, cut stone, brick tile, mantels, electric work, electric bells, electric lighting, hot water heating, plate glass.

Tenders called for apartment house, $20,500. Owner, Dundas Building Co., 17 Murray street, Toronto. Architect, L. S. Yolles, 224 Simcoe street, Toronto. 2 storey, 80 x 66, brick, stone, cut stone, cement work.

Work in progress for residence, $5,-000. (High Park Gardens). Owner, J. P. Lockhardt, 47 Hewitt avenue, Toronto. Architect, W. G. Burns, 74 Indian Grove, Toronto. General contractor, C. C. Fry, 71 Lynd, avenue, Toronto. 2½ storeys, 34 x 36, brick and stone, stone foundation, hot water heating, electric lighting, shingle roofing, interior finish hardwood, tile mantels, sheet metal work, plate glass.

Eight detached dwellings, $14,400. (E. S. Gilmour avenue). Owner, Max Slatkin, 235 Gilmour avenue, Toronto. Architect, W. Milliship, 193 Gilmour avenue, Toronto. 2 storeys, 38 x 17, brick, stone foundation, hot air heating, electric lighting, shingle, felt and gravel roofing, electric work, electric bells. Work will be done by day [illegible]

Tenders called for pair dwellings, $5,-000. [illegible] lan C. Love, 379 Ossington avenue, Toronto. Architects, Designing and

Tenders and For Sale Department

Tenders for Steel Highway Bridge

Sealed tenders will be received up to noon of **Monday, August 28th, 1911**, for the construction of a Steel Bridge, 62 feet clear span, over Oshawa Creek at the Base Line Road, County of Ontario.

Sealed tenders will also be received at the same time for the construction of abutments, retaining wall and reinforced concrete floor for the above bridge.

Plans and specifications may be obtained from the undersigned, upon deposit of the sum of $1.00, which will be returned when plans etc. are returned.

The lowest or any tender not necessarily accepted.

FRANK CHAPPELL,
County Engineer.

Oshawa, Ont., Aug., 1911. 33-34

Department of Railways and Canals

Branch Line of Railway from Dartmouth to Deans.

Sealed tenders addressed to the undersigned and endorsed "Tenders for Branch Line, Dartmouth to Deans," will be received at this office until sixteen o'clock on **Friday, September 15th, 1911**.

Plans profiles, specification and form of contract to be entered into can be seen on and after the 15th instant at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa; at the office of the Chief Engineer of the Intercolonial Railway, Moncton; and at the office of the Board of Trade, Halifax. Forms of tender may be procured from the Chief Engineer of the Department of Railways and Canals or from the Chief Engineer of the Intercolonial Railway.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $150,000, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, August 12th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 33-34

Trench Machines

Parsons—Cuts trench 27 in. to 60 in., to 20 ft. deep, fine order.

Parsons—With Mattes Back Filler, cuts trench 28 in. to 78 in. to 20 ft. deep. Overhauled and first class. Write us if you have anything to sell, or if in want of anything.

THE MALES CO.

No. 82 Perin Building, Cincinnati, O.

MACHINERY BARGAINS

We have for sale for quick shipment from point near Montreal in Canada, several 18-ton saddle back four-wheel contractors' locomotives, and four dozen 4-yard two-way side dump contractors' cars, all 36-in. gauge.

Also one No. 4 Austin gyratory stone crusher with elevator and screen for same.

These items in good condition for immediate service and at attractive prices. For particulars, address—

WILLIS SHAW MACHINERY CO.,
39 South LaSalle Street, Chicago, Ill.

To Contractors

Tenders will be received at the office of the Secretary, School of Mining, Kingston, up to 3 p.m. of **Friday, September 1st**, for the Cabinet Work, comprising Tables, Benches, Fume Cupboards and other Furniture, and also Plumbing and Fitters' Works required in the completion of the Nichol Building for Governors of the School of Mining.

Plans and Specifications may be seen at the office of the undersigned.

The lowest or any tender not necessarily accepted.

POWER & SON,
Architects.

Merchants Bank Chambers,
Kingston, Ont. 34-35

Corporation of the City of Three Rivers

Public Notice

Sealed tenders addressed to the undersigned and marked "Tender for Steel Bridge," will be received at the City Hall, Three Rivers, up to the 25th instant at 4 o'clock p.m., for the erection of a steel bridge with two concrete abutments on the River St. Maurice, the span to be of 200 feet in length.

Plans and specifications may be seen at the office of Mr. Benj. Bourgeois, city engineer, No. 174 Notre Dame street.

An accepted cheque for 10 per cent. of the amount of tender must accompany each tender.

The lowest or any tender not necessarily accepted.

L. T. DESAULNIERS,
Sec.-Treasurer.

City Hall, Three Rivers,
August 4th, 1911. 32-34

FOR SALE

Complete Electric Generating Set, consisting of Leonard Peerless steam engine direct connected to 150 k.w. Canadian General Electric generator, 2,300 volts, 60 cycles; also condenser, switchboard, steam and exhaust piping, spare parts for engine and generator, and everything constituting the complete set as at present installed in the Thomas street lighting station of the Town of Brockville. This machine is in first-class order, having only been used on peak loads. It is now being replaced by a larger Belliss & Morcom engine with Swedish G. E. generator. Full particulars and price can be obtained from Laurie & Lamb, Consulting Engineers, Board of Trade Building, Montreal. 28-35

Department of Railways and Canals

Branch Line of Railway from Guysborough to Sunny Brae through Country Harbour Crossroads to Deep Water of Country Harbour.

Sealed tenders addressed to the undersigned and endorsed "Tender for Guysborough-Country Harbor Line," will be received at this office until 16 o'clock, on **Friday, September 15th, 1911**, for section No. 1 of the above line of railway, comprising that portion extending from Guysborough to Country Harbor Crossroads and from the latter point to Deep Water Country Harbor.

Plans profiles, specification and form of contract to be entered into can be seen on and after the 15th instant at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, at the office of the Chief Engineer of the Intercolonial Railway, Moncton; and at the office of the Board of Trade, Halifax. Forms of tender may be procured from the Chief Engineer of the Department of Railways and Canals or from the Chief Engineer of the Intercolonial Railway.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $100,000, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily
By order,

L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, August 12th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 33-34

The Royal Institute of British Architects, London

Examination for Admission as Associate

An examination for admission as Associate of the Royal Institute of British Architects, London, will be held in Toronto, from the 30th of November to December 6th, 1911.

Full particulars and all information regarding this examination can be had by applying to

F. S. BAKER,
Traders Bank Building,
Toronto.

34-34

Department of Railways and Canals, Canada

Intercolonial Railway

Passenger Station, Truro, Nova Scotia

Extension of Time

The time for receiving tenders for the construction of a "Stone Passenger Station" at Truro, Nova Scotia, has been extended from Friday, the 25th of August, until 12 o'clock noon on **Thursday, the 31st of August.**

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, August 18th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 34-34

CITY OF TORONTO

Tenders for the Supply of Rail Accessories

Separate or bulk tenders on prescribed forms will be received by registered post only addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on **Thursday, August 31, 1911**, for the supply of the following:

(1) 325 kegs track spikes (200) per keg, size of spike 5½ in. x 9-16 in., measured under head.

(2) 1,950 pairs of splice bars.

(3) 9,500 tie rods, 7-8 in. diameter.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained on application to the Department of Railways and Bridges, City Engineer's Office, City Hall, Toronto.

The tenderers shall submit with their tender the names of two sureties (approved of by the City Treasurer, not members of the City Council or Officers of the Corporation of the City of Toronto) or in lieu of said sureties, the bond of a Guarantee Company, approved of as aforesaid.

The lowest or any tender not necessarily accepted.

R. G. GEARY, Mayor,
Chairman of the Board of Control.

City Hall, Toronto,
August 15, 1911. 34-35

Notice to Ditch Contractors

Tenders Wanted

Tenders will be received by the undersigned Township Clerk up to 2 o'clock p.m. on **Monday, the 4th day of September, 1911**, for the construction of Municipal Drain No. 2 in the Township of Maryborough, containing about 43,000 cubic yards of excavation.

Plans, profiles and specifications of this drain may be seen at the Township Clerk's office in the village of Moorefield, or at the engineer's office at West Montrose.

The lowest or any tender not necessarily accepted.

Satisfactory bondsmen or a marked cheque for five per cent. of tender will be required.

C. D. BOWMAN, O.L.S.,
Engineer in Charge,
West Montrose P.O.

W. W. SCOTT,
Clerk of Tp. of Maryborough.
34-35 Moorefield P.O.

CITY OF BRANTFORD

Steel Highway Bridge

Sealed tenders, addressed to Charles Hartman, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ontario, will be received until 12 o'clock noon, on

WEDNESDAY, AUGUST 30th, 1911,

for the construction of a Steel Highway Bridge, length of span 65 feet; width of roadway, 16 feet.

Plans and specifications may be seen and instructions to bidders and forms of tender obtained at the office of the City Engineer.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Engineer's Office, Brantford.
August 22, 1911.

Advertisement

Sealed proposals for an Intake Pipe and Screen Well for the City of Windsor, Ont., addressed to the Secretary of the Water Commissioners, Windsor, Ont., and endorsed "Proposals for Intake Pipe and Screen Well for Windsor Waterworks," will be received at the office of the Water Commissioners of the City of Windsor, Ont., until 12 o'clock noon, **Tuesday, September 12, 1911.**

Proposals shall be made in accordance with the specifications and requirements on file in the office of the Water Commissioners.

Each proposal shall be accompanied by a certified cheque equal to ten per cent. of the amount of tender as surety for the acceptance of the contract, payable on its face to the Water Commissioners of the City of Windsor, Ont.

The accepted contractor will be required to furnish an approved Guaranty or Surety Bond in the sum of 50 per cent. of the full amount of his contract.

The Commissioners reserve the right to reject any or all proposals.

Copies of plans and specifications are on file at the Water Office, Windsor, and also at the [illegible] Detroit, Mich.

By order of the Commissioners,

34-35 W. A. HANRAHAN,
Secretary.

TOWN OF DAUPHIN

Province of Manitoba

Sealed tenders will be received by the Secretary-Treasurer of the Town of Dauphin until 8 p.m. on **Tuesday, September 5th, 1911**, for constructing the following works:—

Contract "I"—Dam and Gate House in Riding Mountains, for Waterworks Reservoir.

Contract "P"—Substructure Sewage Pumping Station in Dauphin.

Plans may be seen at Dauphin or at the offices of the Engineers at Toronto and Winnipeg.

No tender necessarily accepted.

H. F. CALDWELL, Esq., Mayor.
D. D. McDONALD, Esq., Chairman.
J. W. JOHNSTON, Esq., Sec.-Treas.
CHIPMAN & POWER, Engineers.

34-34

Toronto Main Drainage Works

Sealed tenders for the construction of the following sewers will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon of **Tuesday, September 12th, 1911.**

Storm Overflow Sewers—Sorauren Division.

Total length 8,897 linear feet, including the laying of 30 and 36 inch concrete pipe and the supplying and laying of 24-inch cast iron pipe, and 15, 18 and 24 inch vitrified pipe.

Storm Overflow Sewers—Manchester Division

906 linear feet of 3 ft. 4 in. x 3 ft. 8 in. concrete culvert, in open cut.

High Level Interceptor—Section No. 14

985 linear feet of 3 ft. 0 in. x 4 ft. 6 in. egg-shape, brick, in tunnel.

Plans, specifications, forms of tender and conditions relating to tendering as prescribed in City By-laws may be obtained from the Main Drainage Works, Office of City Engineer, Toronto.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman, Board of Control.

City Hall, Toronto,
August 18th, 1911. 34-35

Miscellaneous

AGENCIES WANTED

Two young men with sound practical knowledge of general engineering, mechanical and electrical, with first-class connection in Western Canada, want representation of one or two first-class houses in general electrical and mechanical engineering lines. Are hustlers and can show results. Address, Electrical, Box 2727, Winnipeg, Man. [illegible]

WANTED

Large American firm manufacturing the most [illegible] wants to secure reliable Canadian representatives. System patented in Canada and several instal[illegible] Perry Street, Chicago, Ill. 34-35

To Contractors

Sealed tenders, endorsed "Tenders for Library Shelving and Fittings," addressed to the undersigned, will be received at this Department until noon on **Tuesday, the 5th of September, 1911**, for the library metal shelving and fittings required in connection with the Library Addition to the Ontario Government Buildings, Queen's Park. Plans and specifications may be seen and blank forms of tender obtained at the offices of Geo. W. Gouinlock, architect, 1108 Temple Building, Toronto.

An accepted bank cheque payable to the order of the Honorable J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender, and the bona fide signature and addresses of two sureties, or the bond of a Guarantee Company, approved by this Department, must accompany each tender.

The Department will not be bound to accept the lowest or any tender.

By order,

H. F. McNAUGHTEN,
Secretary of Public Works.

Department of Public Works, Ontario,
Toronto, August 16th, 1911.

Newspapers publishing this advertisement without authority will not be paid for it. 34-35

Positions Wanted

Advertisement under this heading one cent a word per insertion. Box No. ten cents extra Minimum charge 25 cents.

Thorough master of wire and rope splicing wants permanent situation. Own tools; total abstainer; all work guaranteed. Credentials world-wide. Box 320, Contract Record, Toronto, Ont. 34-34

Positions Vacant

Advertisements under this heading two cents a word per insertion.. Minimum charge 50 cents

SALESMEN WANTED

Wanted—Salesman to solicit business from contractors and dealers in contractors' supplies throughout the United States and Canada. Prefer men with experience in contract work, especially with reference to road building and modern methods of transporting materials. Must be of an age, address and experience to command attention of largest contractors.

Application should be accompanied by statement of age, general appearance, class of work have been doing, reason for wanting to change, names of three parties who will vouch for integrity, ability and general worth. Also statement as to when could begin work.

In case of favorable consideration, applicant will be expected after notice from us to come to our office at his own expense before final conclusion of arrangements. Situation permanent and satisfactory to order-getters of quality.

TROY WAGON WORKS CO.,
Troy, O.

34-34

Residences

(continued from page 61)

draughting Co., Toronto street, Toronto. 2½ storeys, 44 x 25, brick and stone, stone foundation, hot air heating, electric lighting, shingle, felt and gravel roofing. Cement work, mantels, electrical work. Tenders close August 24th.

Tenders called for two pair dwellings, $6,800, 741-3-5-7 Keele street. Owner. J. W. & W. W. Schofield, 114 Margueretta street, Toronto. Two stys., 34 x 44, brick, stone foundation, cement work, electric work, hot air heating, shingle, felt and gravel roofing, plate glass, tile, mantels. Tenders received until August 26th for all trades (each pair) but carpentering.

Chas. Johnson, 208 Jones avenue, two residences, 48-50 Englewood avenue, 2 stys., 36 x 15, brick front and roughcast, concrete foundation, shingle roofing.

Mr. Dickenson, 46 McGee street, dwelling, $3,000, three storeys, 45 x 20, brick. C. H. Ramsden, 121 Victor avenue, architect.

E. Carmichal, 5 Evelyn Crescent, residence, $3,000, 3 Evelyn Crescent, two stys., 28 x 28, brick, brick foundation, shingle, felt and gravel roofing.

Vancouver, B. C.

Plans being prepared for apartment and stores. (Alexander street). Owner, Grier Starratt, 1173 Pendrell street, Vancouver. Architect, W. T. Whiteway, Molsons Bank Building, Vancouver. Brick mill construction, pressed brick, 25 x 122, steam heating, electric wiring, hard plaster, interior finish. Tenders probably called this week.

Plans being prepared for apartment house. (Eight and Cedar streets). Owner, J. H. Griffiths, 1794 Seventh avenue W., Vancouver. Architects, Campbell & Dawson, Exchange Building, Vancouver. 2 storeys, frame construction. Work will commence immediately after approval of plans.

Plans being prepared for apartment house, $75,000. (Victor Rd.) Owner, R. W. Partridge, 745 Prior street, Vancouver. Architect, F. H. Perkins, 67 Hutchinson Bldg., Vancouver. 3 storeys, 100 x 224, brick, 1st storey. Denny-Renton paving brick and two upper storeys of light buff brick. P. B. roofing, plate glass. Plans ready for figuring on about Aug. 20th.

Plans being prepared for apartment house. (Melville street, between Bute and Burrard streets). Owner, Name witheld. Architects, Parr & Fee, 570 Granville street, Vancouver. 8 storeys, stone and marble entrance, interior finish hardwood. Plans expected to be finished in about a week. Work is expected to start at once.

Tenders to be called for parsonage. (Pender street E.) Owner, Baptist Congregation (private plans). Superintendent of Construction, J. G. Price. 2 storeys. Tenders to be asked on this shortly.

Winnipeg, Man.

Excavation tenders called for apartment block. (Marion and Tache streets Norwood). Architects, Jordan & Over, 47 Canada Life Building. Tenders are called for excavation of cellar.

Woodstock, Ont.

Residence, $2,700. Owner, J. V. Spedding, Woodstock, Ont. Architect, T. D. Broom & Son, Woodstock; 2 storeys, 24 x 31, brick, concrete and block foundation, combination heating, shingle roofing, interior finish georgia pine, cement work, brick, tile, mantels, electric work, electric bells.

CONTRACTS AWARDED

Halifax, N.S.

Residence, $4,000. Owner, A. Moïten, Halifax, N.S.; general contractor, J. Dawes. Two and one-half stys., wood construction, concrete foundation, electric lighting, shingle roofing, interior finish hardwood, cement work, cut stone, brick, tile, mantels, fireproofing, cornice, weatherstrips, asbestos materials, electrical work, sheathing and deafening paper, "asbestos fire stop."

Hamilton, Ont.

Residence, $4,000. (Fairmount ave.) Owner, W. Aitchison, Queen street S., Hamilton. Architects, J. A. Armes, Federation Life Building, Hamilton. General contractor, R. Tope, 191 Robinson street, Hamilton. 2 storeys, 45 x 50, brick and stone, hot water heating, heating, plumbing, sheet metal and iron work, contracts not yet awarded.

Toronto, Ont.

The contracts for an $8,500 residence being erected by T. M. Rowland at Elm and Glen road, have been awarded as follows: Masonry, Smallwood Bros., 97 Clinton street; roofing, Rennie & Son, 130 Dupont street; plastering, Duckworth Bros., 119 Huron street; painting, F. C. Davis, 218 Montrose avenue; plumbing and heating, Fiddes & Hogath, 122 King street east; wiring, Robert Simpson Co., Yonge street, all of Toronto.

New Liskeard, Ont.

The contract has been awarded to Hill & Clark, New Liskeard, for a $5,000 residence being erected by A. J. Herman; architect, C. L. Stewart; 2½ stys., 27 x 42, brick.

Red Deer, Alta.

Baird & McKenzie, contractors, Red Deer, have the contract for building a $2,100 residence for Mr. T. W. Wright.

A. T. Morris, builder, Red Deer, has the contract for $3,000 residence for Mr. W. Bredin Galbraith.

Paradis & Roberts, contractors, Red Deer, have the contract for a residence for Mrs. A. Welton, $2,800.

Vancouver, B.C.

Architects W. M. Dodd & Co. have awarded the contract on a house for Mr. W. Dixon Hopcraft on Shaughnessy Heights, to Chas. Kilpin, two-sty., hot water heating, and all modern conveniences, cost $5,000.

Business Buildings and Industrial Plants

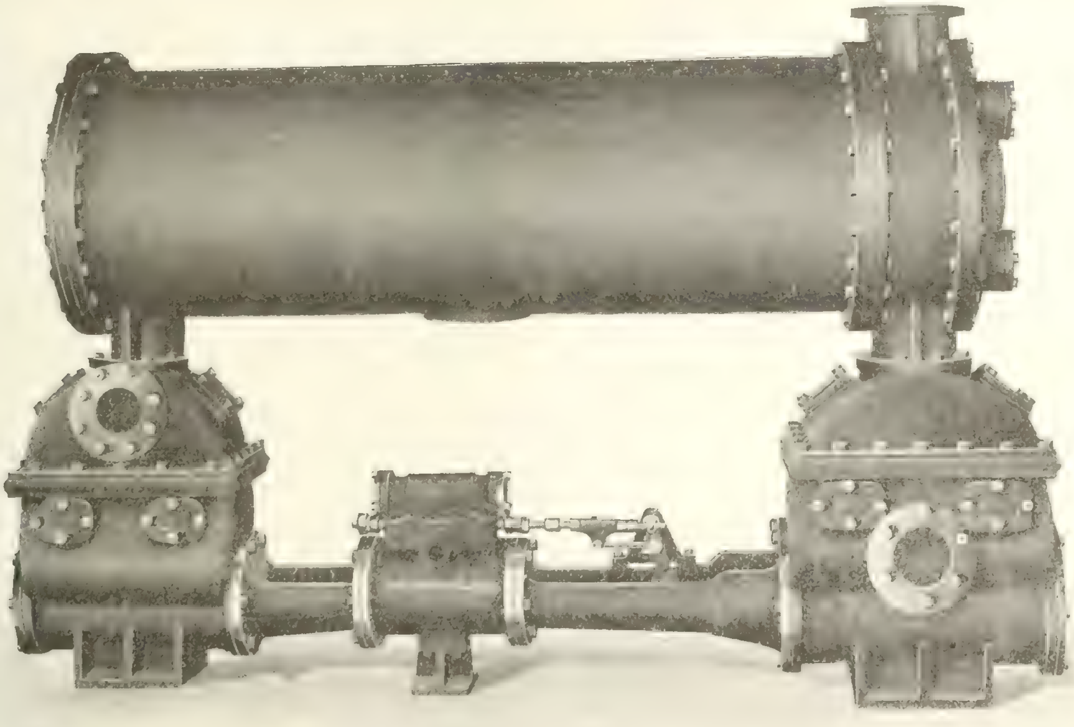
Calgary, Alta.

Tenders have been called for a $40,000 warehouse on Eleventh avenue, between First and Second streets west, for the Coulther-Waugh Fur Company, of Montreal, who apparently intend invading the western field. The representative of the firm was in Calgary a few weeks ago and made all arrangements for the purchase of lots whereon to build a warehouse 50 by 150 feet.

The Alberta Pacific Elevator Company will at once begin the erection of a large elevator at Brooks.

Tenders called for bank, Eighth ave. west. Owner, Molsons Bank of Canada; architect, F. J. Lawson, Norman Block, Calgary. Skelton steel construction,

CONDENSORS



Condensor built by The John Inglis Co., Limited

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

Let us Submit Prices.

The John Inglis Company

Limited

Engineers and Boilermakers

14 Strachan Ave., TORONTO, Canada

walls of brick, hollow tile floors and partitions, front of granite and cut stone. Plans, etc. ,at office of architect. Tenders received by architect until August 24th

Chilliwack, B.C.

A. M. Rockwell & Co. are contemplating the erection of a large storage warehouse on the trackage property between the B. C. Electric tracks and those of the Canadian Northern.

Fort Frances, Ont.

Alex. Bruce & Co., Glasgow, Scotland, holders of the special "Creosote process," have made all arrangements and are now building at Fort Frances one of the largest plants for curing timber on the continent. The plant, costing about $250,000, is now under construction, some fifteen carloads of machinery having arrived. The capacity of this plant will be not less than one million ties, not including culvert timber, poles, posts, etc. They have secured a contract from the McKenzie-Mann Company to cure 100,000 ties this fall, and one million ties for the next year. This new industry will give employment to between two hundred and three hundred men the year round.

Plans prepared for foundry, $10,000. Owner, Russell Bros., machinists. A new foundry to manufacture castings, and several interesting devices of which the owners are the inventors will be built at once.

Grimsby, Ont.

A by-law will be submitted on the 31st of August for the raising by debentures of the sum of $10,000 as a loan to aid the Radiant Electric Company, Ltd., of Grimsby, in establishing and carrying on the manufacture of electric appliances of all kinds.

Hamilton, Ont.

Plans being prepared for motor. Owner, Steel Co. of Canada, Ltd., Sherman ave., W., Hamilton. Mr. R. S. Kelsch, 702 Power Building, Montreal, Que., has been instructed to prepare plans and specifications for a 2,000 h.p. motor to operate their main steel works.

Langley, B.C.

Mrs. Jennie V. Jones has purchased the George Hunter property in this municipality and will erect an hotel adjoining the Griffith road and B C. E. R.

Louisburg, N.S.

The Gorton Pew Fish Co., Gloucester, Mass., are contemplating the construction of a fish drying and cold storage plant here.

North Bay, Ont.

Plans being prepared for store, $17,000. Owner, Cochrane Hardware, Ltd., North Bay. Architect, H. W. Angus, North Bay. 2 storey and basement, 35 x 132, solid brick, stone foundation, steam heating electric lighting, tar and felt roofing, interior finish pine, structural and ornamental iron, vaults, freight elevator, metal ceiling, skylights, fireproof doors and windows, pipe covering, electrical work, deafening paper, steel beams, plate glass. Tenders to be called in three weeks.

Nanaimo, B.C.

The Merchants Bank have purchased the home of Mark Bate ,corner of Albert and Wallace streets, and will erect a building on the property.

Ottawa, Ont.

Specifications prepared for warehouse, $10,000. Owner, Jas. Robertson, Albert street, Ottawa; architect, M. C. Edey, Sparks street, Ottawa; masonry contractor, Alex. Robertson, Ottawa; carpentry, McDiarmid & Tyndall, Ottawa; iron work, Alex. Fleck, 428 Wellington street, Ottawa. Four stys., 33 x 70, solid brick.

Rainy River, Ont.

The Western Canada Flour Mills Co., with head office at St. Boniface, is almost doubling their plant here, which is operated for the manufacture of barrel staves.

The Rat Portage Lumber Co., head office, Winnipeg, is contemplating the rebuilding of their sawmill here.

Saskatoon, Sask.

A by-law will be submitted on August 23rd for the raising of $25,000 to provide for city stables and storehouse.

St. John's, Que.

Equipment about to be installed for manufactury. (Shirts and collars) Owner, Cluett, Peabody & Co., Troy, N. Y., U. S. and St. John, P. Q. Company about to install required machinery, steam power, electric plant, etc. Branch factory erected in St. John.

St. John, N. B.

Application for incorporation of the New Brunswick Portland Cement Co. A meeting will be held here shortly for organization. Application to Ottawa has been made. It is intended to raise $1,000,000. Senator Domville, Rothesay, N. B., is actively interested. The oil shales at Albert County, Mines will be used in the manufacture of the cement. No coal required, as gas in rock will provide necessary fuel.

St. Catharines, Ont.

D. J. Albertson, 305 West Main street, Kalamazoo, Mich., is preparing plans for a tissue paper factory to be located here.

Toronto, Ont.

Addition to store and dwelling, 3,500. (1136 and 1136½ Dufferin street). Owner, J. H. Huckle, 1136 Dufferin street, Toronto. 2 storeys, 40 x 32 ft. 8 in., brick, stone foundation, electric lighting, shingle, felt and gravel roofing. Work will be done by day labor.

Tenders called for bank, Queen and Kingston road. Owner, Imperial Bank, Leader Lane and Wellington street; architect, Sharp & Brown, 16 Wellington east, Toronto. Two stys., 36 x 35, brick, stone foundation, hot water heating, felt and gravel roofing, electric lighting. Tenders received until August 23rd.

Plans in preparation for erection of a factory. Owner, General Business Properties, Ltd., George street. (near Queen). Architect, A. R. Denison & Stephenson, 16 King street W., Toronto. 3 storeys, 100 x 54, brick.

Tenders called for factory, $10,000. (near Dundas street bridges). Architect, A. J. Rattray, Stair Building, Toronto. 1 storey, 154 x 50 ft. 4 in., brick foundation, steam heating, electric lighting, felt and gravel roofing, cement work, brick, reinforced concrete, metallic lath. Tenders close Aug. 23rd.

Addition to warehouse, $5,000. Owner, Wettlaufer Bros., 178 Spadina avenue, Toronto. Architect, E. H. Beck, 15 Toronto street, Toronto. 1 storey and basement, 91 x 31, concrete, concrete foundation, electric lighting, felt and gravel roofing, reinforced concrete, structural iron, skylights, steel beams. Work will be done by day labor. System of heating undecided.

Tenders called for warehouse, (Clarence Square). Owner, Steel Briggs Seed Co., Ltd. Architect, Sproatt & Rolph, 90 Yonge street, Toronto. 5 storeys, brick and mill construction, brick foundation, steam heating, electric lighting, felt and gravel roofing, brick, 3 freight elevators, plate glass. Tenders for excavation close Aug. 19th, and for masonry, Aug. 26th.

Tenders called for addition to warehouse, $3,000. (927 Dufferin street). Owner, H. E. Hayhoe & Co., 927 Dufferin street, Toronto. Architect, W. J. Thompson, 567 Bloor street W., Toronto. 1 storey 41 x 70, brick, stone foundation, steam heating, electric lighting, felt and gravel roofing. Tenders received until Aug. 19th.

Vancouver, B. C.

Office Building. (Richards street). Owner, Canada Permanent Mortgage Corporation, 543 Granville street. Architect, T. S. D. Taylor, 543 Granville street. 2 storeys, (at present) granite facing, marble panelling and counters, hardwood floors, hot water heating, electric wiring.

Plans prepared for store and apartments. Architect, G. P. Bowie, R. I. B. A., 570 Granville street, Vancouver. 4-storey 25 x 120, mill and brick construction 3 flats to be used as apartments. Tenders called shortly. Plans are being prepared by same architect for several fireproof garages.

Tenders to be called for two hotels. Architect, R. T. Perry, 744 Hastings street, W., Vancouver. Brick, mill construction. Plans are being completed for two hotels, one to cost about $50,000; the other $60,000. Tenders called about Aug. 20th. Supplementary report later.

Plans have been prepared for a 2-sty. brick addition to the Eligh-Depencier block on Powell street.

Tenders to be called for store and office building, $80,000. (Broad and View streets). Owners, Messrs. McPherson Fullerton, McLean, Elliott and Shandley. 6 storey proposed, (4 storey at present) tar and gravel roofing, marble, tile, sheet metal, reinforced and structural steel, metallic lath, hard plastering, plate glass. Excavation has started. Tenders invited after August 20th on general contract, electric wiring, plumbing and heating.

Winnipeg, Man.

Site purchased for office building, 436 Main street. Purchaser, Great West Permanent Loan Company. Dimensions of site, frontage, 50 by 120 ft. depth. Proposed structure 6 storeys. Lease of building on property purchased expires in February, 1912, when work of tearing down will commence.

A new company has been organized under the name of the Hardstone Brick Manufacturing Co., with a capitalization of $500,000. Foundations are already being laid for a building.

The Canadian Bread Company is preparing to erect a large bakery plant at the corner of Burnell street and Portage avenue. Building to be two storeys, and to cost $250,000. The W. J. Boyd Company incorporated with this company a short time ago.

VERTICAL SHAFT PUMPS

It is frequently found necessary to locate a centrifugal pump in a pit below the floor level, in order to get within suction distance of the water supply. In cases of this kind the vertical centrifugal has been extensively used and has proved most satisfactory.

The pumps can be either belted or connected directly to vertical motors. The latter method makes an ideal pumping plant, as the motor can be located above ground where it is free from all moisture and can receive proper care. The design of the pump is such that it requires very little attention, and it is necessary for the attendant to go down into the pit only at long intervals.

Other illustrations of these pumps will be found in

Bulletin 109

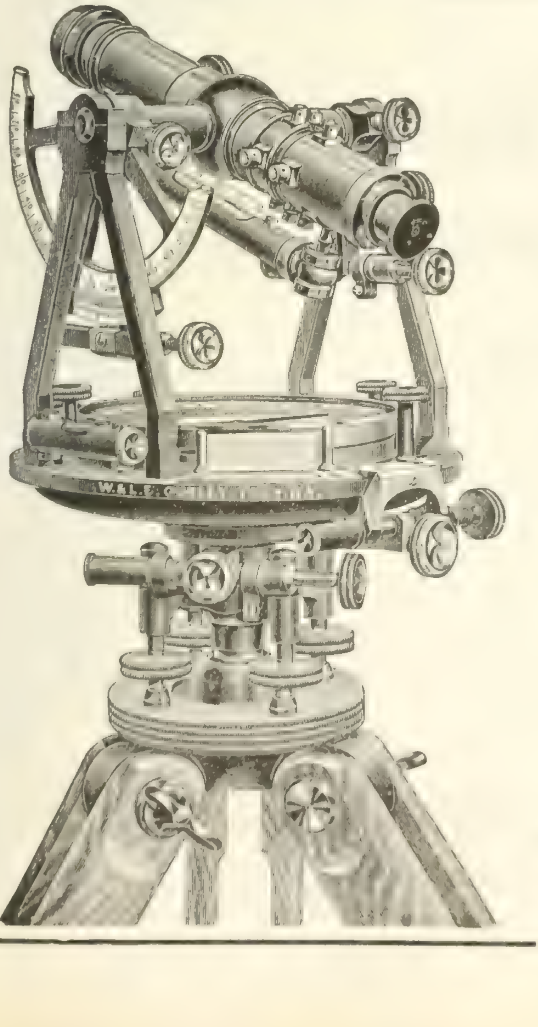
4" Turbine Pump, Capacity 333 Imperial Gallons or 400 U.S Gallons per minute. 94 feet. 20 H.P. at 1,130 r.p.m.

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.

LIMITED

WORKS:
512 William St., MONTREAL

SALES OFFICES:
MONTREAL, TORONTO, COBALT, WINNIPEG, CALGARY, VANCOUVER



1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

Transits	Current Meters
Y Levels	Levelling Rods
Compasses	Chains
Plane Tables	Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

Municipal Contracts Should be Let at the Lowest Possible Figure

You cannot secure low bids unless you place your proposition before a large number of contractors. The larger the number, the greater the competition and consequent saving on your contract.

More contractors look for proposed work in the

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building Contracting Engineering Public Works
Municipal Progress Advance Information

than in any other publication. A moderate expenditure in the advertising of proposals will convince you of the service that the CONTRACT RECORD can give you. When you have "Tender" advertising to place do not forget that this paper carries more advertising of this sort than any other journal. CONTRACT RECORD, 220 King St West, Toronto.

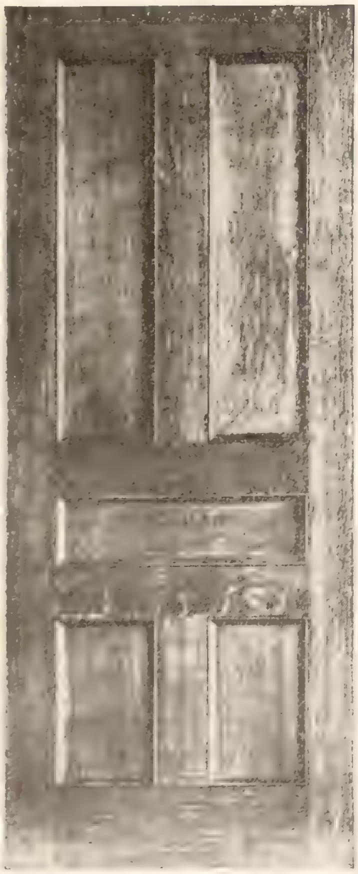
THE CEMENT ERA—A monthly trade journal of merit. Devoted to the concrete and cement industry. Is carefully edited in the interest of the trade. Covers the following subjects: Reinforced Concrete Building, Cement Block Manufacturing, Tile Making, Concrete Paving, Ornamental Cement Work, Waterproofing, Fireproofing, etc. $1.50 a year. Send for sample.

CEMENT PIPE AND TILE—By E. S. Hanson. A cloth bound book which fully treats the subject of manufacturing cement pipe and tile, its uses, cost of production, etc. Its author is recognized as the leading authority on this subject. Price $1.00 a copy, delivered.

DIRECTORY OF PORTLAND CEMENT MANUFACTURERS together with manufacturers of Gypsum and Lime. The only directory of its kind. Gives a full list of the companies, their officers, capacity of plants, capitalization, process of burning, etc. Price $1.00 a copy, delivered.

The Cement Era Publishing Co.

1200-1210 Morton Bldg. - CHICAGO, ILL.



Doors Sash Frames House Trim

All manufactured in our new and up-to-date factory with latest and best machinery. A knowledge of the requirements of contractors and architects demanding high grade material has enabled us to market interior finish that CAN'T BE BEATEN.

Georgian Bay Shook Mills, Limited

MIDLAND, ONTARIO

NATIONAL BRIDGE CO.
OF CANADA, Limited

J. N. Greenshields, Pres. William Lyall, Vice-Pres. H. W. Beauclerk, Treas. J. L. Brower, Gen. Mgr.

The 1st Unit of 20,000 Tons Capacity now in Operation

Head Office and Works - - - MONTREAL, QUE.

Armstrong
CRANES

Built for Every Service
up to 75 tons capacity

Electric Traveling Cranes, Standard
Electric Traveling Cranes, Special
Electric Gantry Cranes
Electric Jib Cranes
Hand Operated Cranes
Locomotive Cranes
Hydraulic Cranes

H. J. ARMSTRONG
Engineer and Manufacturer
Markdale, Ont., Can.

"Hammer Brand"
Hard Wall Plaster

HARD-WALL PLASTER
HAMMER
BRAND
HILLSBOROUGH, N.B.

It neither loosens nor falls off, it allows carpenters to follow plasterers without loss of time and lasts as long as the building.

Albert Manufacturing Co.
Hillsborough, New Brunswick, Canada

Works Destroyed by Fire
— Now Rebuilding

THE H. & E. PATENT BALL-BEARING LIFTING JACKS
For Railway and Bridge Work, Contractors' and Builders' Use

Made by practical Jack Builders. Material best grades of malleable iron and steel Fully guaranteed as to durability and efficiency. The long even stroke of the lever, together with the design and careful construction of the jack, makes it the quickest and easiest working lifting appliance on the market. Made in plain and foot-lift styles. Adapted to all classes of work where a lifting jack can be used. Sizes from 8 to 50 tons capacity now complete: Send for prices and discounts.

To any responsible Firm or Railway in Canada any of these jacks will be sent on 30 days trial.

Manufactured by

H. & E. Lifting Jack Company
Waterville, Que.

Stock carried by F. H. Hopkins & Company, Montreal.

The above cut shows building built by us last year for the Ford Motor Co. of Canada, Walkerville, Ont. We have just been awarded the contract for two more buildings for the same firm. One building, 75 x 200 ft., four stories and the second building, 40 x 110 ft., two stories.

WELLS & GRAY, Limited, Engineers and Contractors, **Toronto**

Abrico Road Drag No. 1

It Cures Sick Roads

Patented April 28, 1908

Length 8 feet. Width between blades 30 inches. Blades 6 inches. Weight 300 pounds.

Do you want nice smooth roads?

This Drag will take out all of the **bumps** and fill up all the **ruts.**

It is of steel construction and is adjustable, both forward and backward, and can be operated by one man and team.

Do not let distance keep you from having one.

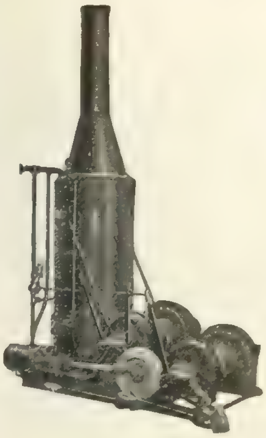
Your order by mail will be given careful attention.

Manufactured by

Attica Bridge Company

Attica, Indiana, U. S. A.

Canadian Representatives desired. Write for special terms.



Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

Let us send you a sample of our

STEEL ROOFING
FOR
FLAT ROOFS

You will find it highly satisfactory for flat-roofed buildings of all kinds. It is permanent, fire-proof, weather-proof and easily laid.

Send for free sample and our illustrated catalogue.

Corrugated Iron **Metallic Shingles**
Metallic Sidings **Metallic Ceilings**
Etc., Etc.

The Metallic Roofing Co. LIMITED
Manufacturers
TORONTO, ONT. WINNIPEG, MAN.
30

DOORS

Pine and
Hardwood
Veneer

Interior Finish

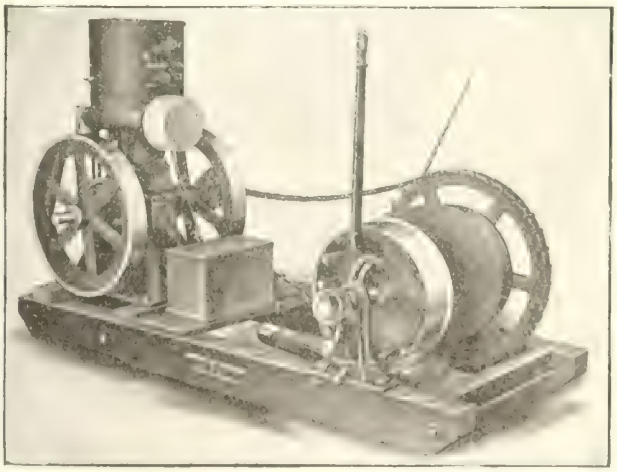
Stair Work

Interior
Hardwoods

Send us your plans and specifications and let us quote you

The
BRYAN
Manufacturing Co.
Limited
Collingwood, Ontario

DO YOU WANT A GOOD HOIST?



PATENT APPLIED FOR

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work **Mortar Conveying** **Well Digging**
Bridge Building **Sewer Building** **Pile Driving**

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists London, Canada

CONTRACTORS LOCOMOTIVES

ONLY ONE QUALITY

Montreal Locomotive Works, Limited, standard contractors locomotives are designed by engineers who have made a life study of the special conditions of contractors service and know what is needed to meet these conditions.

Their large boilers insure free steaming and ability to handle the load for which they are rated. Every piece of material entering into their construction must conform to the same specifications required for 200-ton locomotives. Only the best materials are used.

Contractors locomotives must frequently be operated long distances from repair shops, therefore simplicity and facility for repairs are vitally necessary. This was considered in designing this type of locomotive.

Every part is made in jigs or to gauges, and every part is sure to fit. Stocks are always available at our Works at Longue Pointe, Montreal, Canada.

MONTREAL LOCOMOTIVE WORKS, LIMITED

OTTAWA BANK BUILDINGS, MONTREAL, CANADA

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: Montreal St. John, N.B. Winnipeg Calgary Vancouver

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

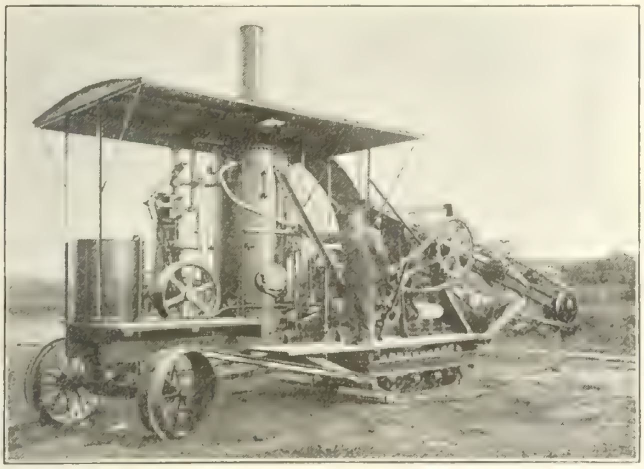
STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works :
Kirkfield, Ont.
Phone Main 4516

Head Office :
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Austin Trenching Machines

Will dig trenches in a straight line or in a circle as small as it is possible to lay ten-inch pipe.
Can be turned in their own length, and will travel backward as well as forward.
Are self propelling and will travel over ordinary roads at the rate of one and a half to three miles an hour. Can be moved from one job to another and be ready to dig at any time, as no parts are taken off or disconnected when moving.



Have self-cleaning buckets with tool steel cutting edges. No matter how sticky the ground may be, it is impossible for them to clog, because every time a bucket discharges an automatic cleaner scoops out the inside so thoroughly that no earth adheres to it.

Note the caterpillar, or multipedant, traction. The wide bearing on the ground enables it to travel over soft, wet ground that would not support a machine of half the weight mounted on ordinary trucks.

Only one man required to operate the entire machine and his only duties are to guide it so that it will follow the line.

They will dig any soil, wet or dry, except solid rock.

Austin No. 1 digs trenches 12 ft. deep, 24 in. to 36 in. wide.
Austin No. 0, 10 ft. deep, 18 to 27 in. wide.
Austin No. 00, 8 ft. deep, 15 to 27 in. wide.
Austin No. 000, 6 ft. deep, 15 to 18 in. wide.
Austin No. 000, 4½ ft. deep, 14 in wide.

Complete Line Described in Catalogue No. 120-A.

F. C. Austin Drainage Elevator Company

Railway Exchange, CHICAGO, ILL. Agents Wanted in Unoccupied Territory.

Canadian Equipment & Supply Co., Calgary and Vancouver Agents for Western Canada.

Terra-Cotta Fireproofing

Get an Estimate from

ROBERT BENNETT
Contractor

Scarboro Junction, P. O.

☞ Over 25 years experience in U. S. and Canada

PHONE BEACH 4

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

THE COMMERCIAL

WINNIPEG

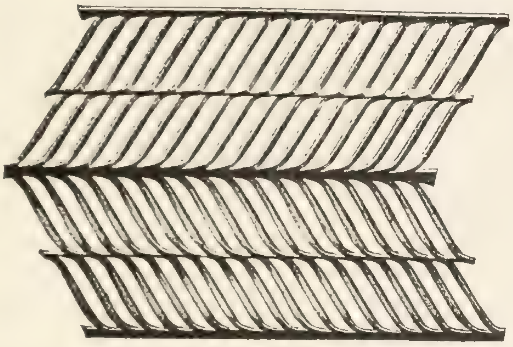
Orleans Filtration Plant and Concrete Building taking about 100,000 barrels of Alsen's New Cement

Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

Sherardized Herringbone Lath is the Best in the World



Every plasterer knows that the cause of corrosion in metal lath is gypsum in the plaster. Thomas Heyes & Sons, Toronto, Consulting Chemists, imbedded a piece of Sherardized Herringbone Lath in pure Plaster of Paris and tested it frequently for five months. They report that it showed absolutely no signs of deterioration. The price is also attractive;

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.
Metal Shingle & Siding Company, Manufacturers

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

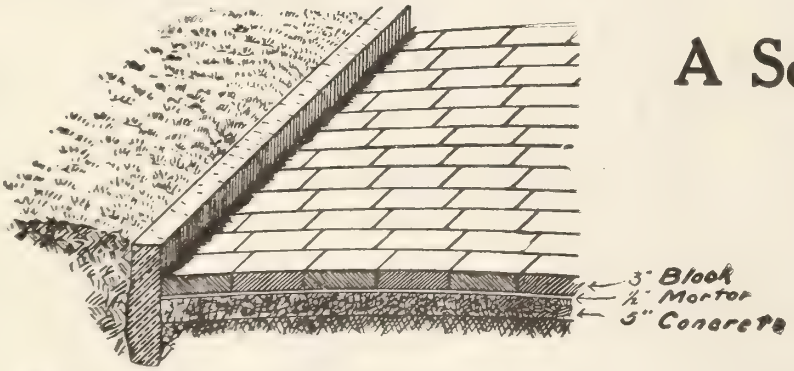
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements
Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

for Highest Efficiency, Absolute Reliability, Greatest Economy

**Used by the Largest Mining Companies and Hydro-Electric Plants.
Also Extensively for Dredging, Exhaust Steam, Compressed Air, etc.**

Sizes 3 to 42″ Diameter up to ¼″ in thickness
Easily installed and securely connected with our Forged Steel Flanges or All Steel Bolted Joints.

Write for our Catalogue [illegible] and prices on your requirements

AMERICAN SPIRAL PIPE WORKS - MAIN OFFICE—CHICAGO
NEW YORK OFFICE—50 Church Street

55,000 cu. yds. of Concrete
placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)
"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."
W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.
1032 Garfield Building, CLEVELAND, OHIO
SELLING AGENTS
The Dominion Equipment & Supply Co., Winnipeg, Canada

Specify

Guelph Hydrated Lime

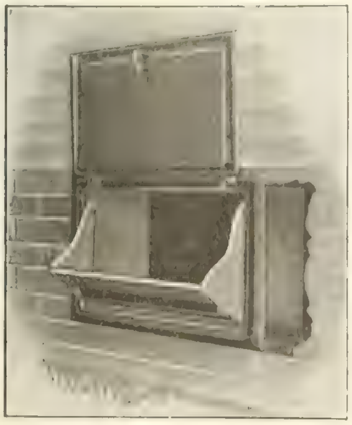
You will save dollars if you use this brand in place of ordinary lime.

It's Less Trouble
Costs Less
Goes Further
Works Easier
More Convenient

And a hundred other reasons that you can discover by using it.

Specify **Guelph Hydrated Lime** when ordering from your dealer.

Standard White Lime Co.
Guelph - Ontario



EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

Send for our illustrated [illegible]

The Down Draft Furnace Co., Limited
Galt, Ontario, Can.

Montreal Representative: E. F. Dartnell, No. 8 Beaver Hall Square.
Gorman, Clancey & Grindley, Agents, Calgary and Edmonton, Alberta.

KITON is nothing else but **TAR**

which through a Patented Process is made

Soluble in Water

This solubility however is lost, the moment KITON becomes dry for the first time, that is, after evaporation of the water with which it is mixed. From that instant on, KITON can never be re-dissolved in or washed off by water. It is **impervious** and **weatherproof.**

just like tar

BECAUSE it can be applied as easily as ordinary paint,
" it can be coloured if desired,
" it is so economical and yielding,
" it is instantly ready when you want it,

KITON is the cheapest and most reliable surface coating for material subjected to the deteriorating action of weather and atmosphere.

ASK FOR BOOKLET, SAMPLE AND PRICES
ATTRACTIVE PROPOSITION FOR DEALERS

F. P. Mansbendel
General Distributor for Canada
212 Huron St., - Toronto, Ont.

British Made

Terra Cotta

the product of
King Brothers, Limited
STOURBRIDGE, ENGLAND
Proprietors of Stourbridge Clays

REDS--BUFF--STONE--GREY

and all Colors, Glazed and Unglazed

Estimates on application by

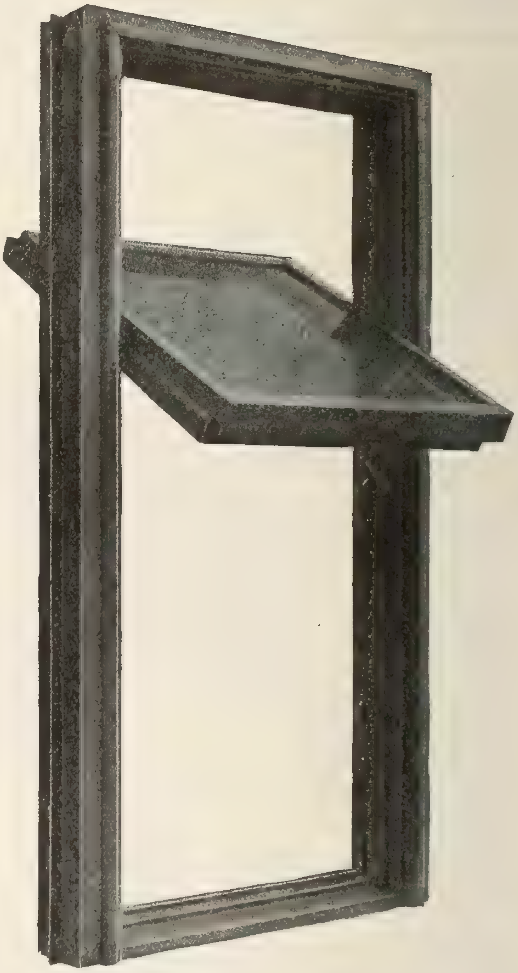
The Toronto Plate Glass Importing Co
Tel. M. 3877 Don Roadway, Toronto Limited

Reasons why

you should specify

DOUGLAS BROS.

FIREPROOF WINDOWS



View of Double Hung Window

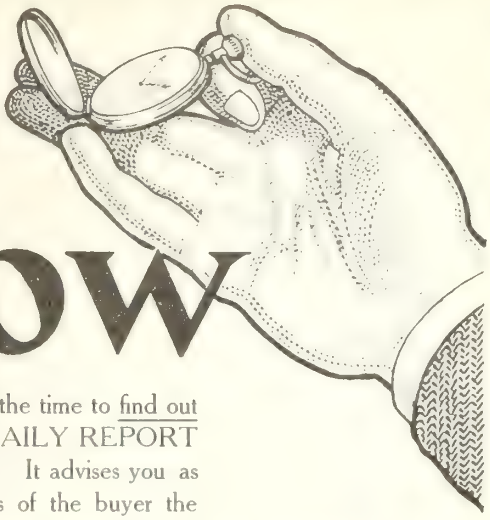
Easy to handle.
Mechanically perfect in construction.
Rigid and easily glazed.
Simply made and easily adjusted.
Made in a model factory by special machinery and skilled workmen.
And always delivered on time.
Other reasons will be found in our catalogue.

SEND FOR A COPY

Douglas Bros., Limited
Toronto, Ont. Montreal, Que.

IRON STAIRS

Dennis Wire & Iron Works Co.
London, Canada Limited
Toronto Offices - 12 QUEEN STREET E.



NOW

is the time to find out about our DAILY REPORT SERVICE. It advises you as to the wants of the buyer the same as financial reports do as to his responsibility to pay. It enables you to select from the whole field those opportunities that promise the most profit and which you can handle to the best advantage. It will minimize the effort on your part necessary to locate the man who will place the order. Wider opportunities mean better prices.

Let Us Tell You Just How We
Can Assist You in Making Sales

MacLean Daily Reports
Limited
220 King Street West, Toronto

Producers of the Celebrated

"Peerless"
Bedford Stone

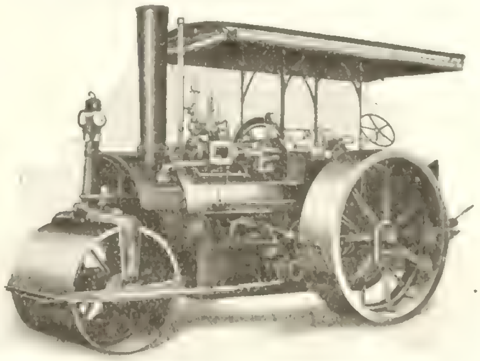
Bedford Indiana Limestone

Mill Blocks
Sawed Planed and Turned Stone

W. McMILLAN & SON
(Incorporated)
General Offices
Chamber of Commerce Building
CHICAGO, ILL.

Quarries and Mills { Bedford, Ind.
Bloomington, Ind.

"A Canadian Roller
for Canadian Roads"



THE WATEROUS
DOUBLE CYLINDER
STEAM ROLLER

is built essentially to suit Canadian road building conditions. Over 100 Rollers in use in Canada to-day are proving their ability as road makers of the highest quality. A greater rolling capacity, with less cost of maintenance and operation, are its distinguishing characteristics. [illegible]

The Waterous Engine Works Co.
Limited
BRANTFORD, CANADA
Agent—Hugh Cameron & Co., 72 Queen St. E., Toronto, Ont.

Ritchie Contracting & Supply Co.,

Limited

7th Floor Bower Building, 543 Granville Street,
VANCOUVER, B.C.

Manufacturers and Dealers in Building Materials and Contractors' Supplies

We carry in stock **Ransome Concrete Mixers** and parts.

AGENTS FOR :—**Hart-Ottis Convertable Cars**
Davenport Locomotives
McCully Rock Crushers
Marion Steam Shovels
The Dominion Wire Rope

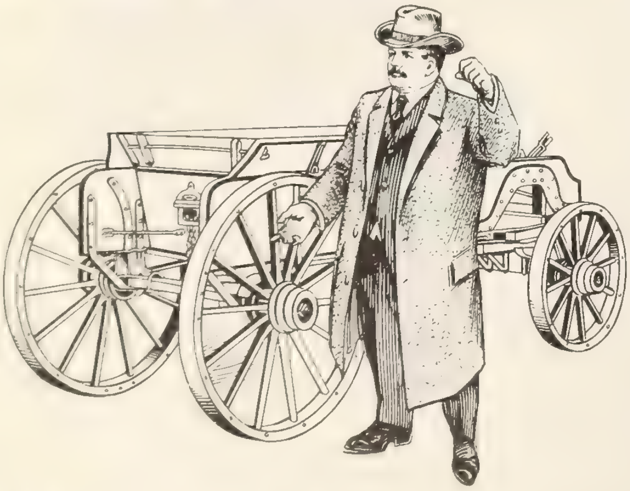
Write, phone, or call for prices and catalogues.

Our aim, prompt delivery.

Jim Fellowes Talks :—

WHEN A WATSON DUMP WAGON IS PAINTED it gets **four** coats applied WITH A BRUSH. BY HAND. If you think the use of the brush is not worth mentioning, let me say that dipping is a very common process in many factories.

The Watson factory managers are not interested in the wonderful properties of substitutes for pure white lead, linseed oil and real turpentine. The Watson factory is the despair of the salesman with something "just as good".



I suppose the WATSON painting cost could be divided by three, and probably not one man in fifty could tell the difference at the time the wagons left the factory, but WATSONS are not turned out in that way.

I notice that a contractor boosts for the man who sells him a dump wagon that lasts years longer than he thought it would. It is some such thing as this that keeps the sales of WATSONS piling up higher and higher every year. The news gets around. There's no stopping it. What I would like to do is to send you the printed matter. It's just as high grade as the wagon, which is "going some", even for printed matter. Just address JIM FELLOWES, Canastota, N. Y.

Watson Wagon Company, Canastota, N.Y.

The First Builders of Bottom Dump Wagons

BRANCH OFFICES:
256 Broadway, New York, N.Y.
604 Witherspoon Bldg., Philadelphia, Pa.
806 Renshaw Bldg., Pittsburg, Pa.

COFFERDAMS
AND CONCRETE WORK

Cofferdam at Southampton; 40 feet x 12 feet, 14 feet deep.

We are experts at this work and before you close a contract, get our figures. We also manufacture Standpipes and Elevated Tanks, Steel Piling, Boilers, etc.

Get our figures before closing your contracts.

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

Cut shows a Brown Hoist Locomotive Crane at work on the New York-Catskill Aqueduct. This crane is doing the excavating; placing the forms; handling the concrete in tubs; and covering up, besides the other miscellaneous work. *Catalogues are sent on request.*

The Brown Hoisting Machinery Co.
Main Office and Works, **CLEVELAND, OHIO.**

Chain Belt Mixer

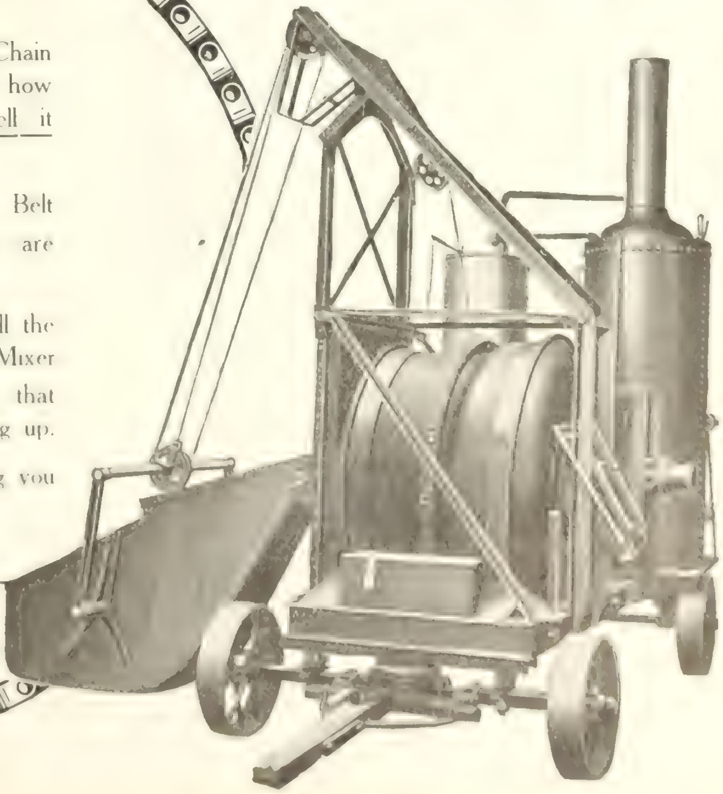
CANADIAN REPRESENTATIVES
Mixers in Stock for Immediate Delivery
MONTREAL—Canada Machinery Agency.
WINNIPEG—Dominion Equip. & Sup. Co.
VANCOUVER—Robt. Hamilton & Co.

WHEN you study the construction of the Chain Belt Mixer you just naturally wonder how we can make such a good mixer and sell it at a competitive price.

You get more real value in the Chain Belt Mixer because our manufacturing facilities are unequalled in the mixer field.

Every Casting all the Steel Work all the Machine Work—in fact every part of the Mixer is made in our factory by an organization that we have been a third of a century in building up.

A line to our nearest agent will bring you catalog and complete information.



Chain Belt Company
Established 1882
Milwaukee, Wis., U.S.A.

Everything in Lumber for the Contractor

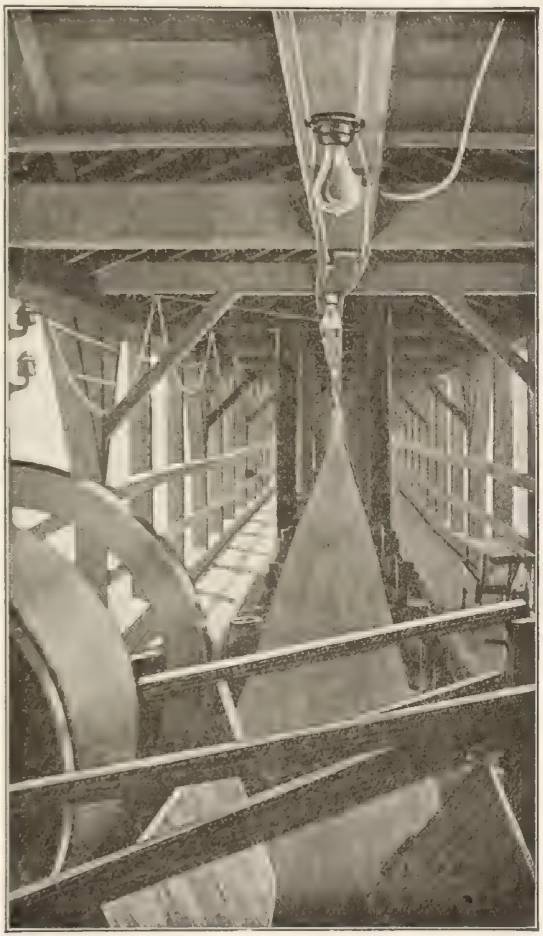
Fir, Hemlock, Spruce, Pine and Oak Timber and Lumber

We specialize in

Southern Pine Timber and Piles

10,000 Green Tamarac Piles for Immediate Shipment. Get our Prices.

THE ELMITT LUMBER CO. LIMITED, OTTAWA, ONT.



SCANDINAVIA

Conveyor Belting

in use at Plant of Lawrence Cement
Company Siegfried, Pa.

For Conveying and Transmission

Conditions may be WET or DRY

Federal Engineering & Supplies
Limited
284 Yonge Street, TORONTO

Stock Carrried at:

MONTREAL—Federal Engineering & Supplies Ltd., 329 St. James St.
CALGARY—Great West Saddlery Company
COBALT—Geo. Taylor Hardware Company
OTTAWA—McDougal's Limited
QUEBEC—Jos. Oullet, 12 Rue Carson, Jacques-Cartier
ST. JOHN, N.B.—Kinnear & Company
HALIFAX—Geo. B. Oland & Company

THE

Thames Quarry Co.

St. Mary's, Ont.

CRUSHED STONE

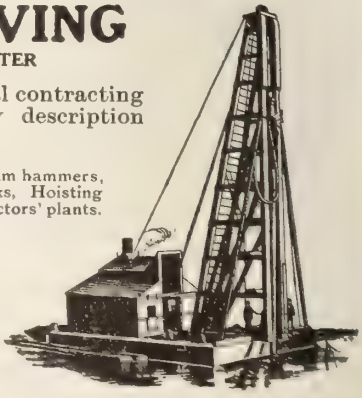
Rubble, Coursing and Dressed Stone

Lime Stone for Flux

JOHN BONIS, Manager

Office Phone 110a Res. Phone 110b

Agent for Toronto: S. H. HURST, 854 Dundas St.



PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.

The
Missisquoi Marble Company
Limited

Canada's Pioneer and Leading Concern in the Marble Business

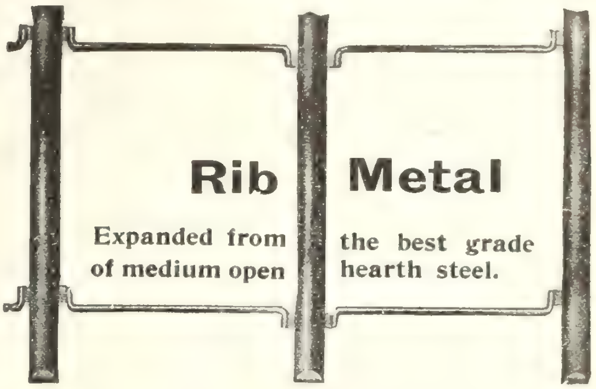
They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd. - -	Toronto, Ont.
C. N. Barclay - -	Winnipeg Man.
Bosse & Banks - -	Quebec, Que.
General Contractors Supply Company, Ltd. -	Halifax, N. S.
129 Sparks Street - -	Ottawa, Ont.
James Robertson Co. Ltd. -	St. John, N. B.
G. R. Duncan - -	Fort William, Ont.
Walker & Barnes - -	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd. -	Vancouver, B. C.
315 Coristine Building -	Montreal, Que.

KAHN SYSTEM

of Construction includes



Rib Metal

Expanded from of medium open the best grade hearth steel.

Supplied in sheets up to 18 ft. in length, width 16 in. to 5 ft. 4 in. For reinforcing concrete floors, roofs, walls, cisterns, etc.

Other Products—**Kahn Truss Bars, Rib Bars. Hy-Rib, Trus-Con.** Chemical products for waterproofing and finishing concrete.

Trussed Concrete Steel Co.
of Canada, Limited
Head Offices and Works, Walkerville, Ont.

BRANCHES:
TORONTO—23 Jordan St. WINNIPEG—Union Bank Bldg.
MONTREAL—128 Coristine Bldg. VANCOUVER—52 Hutchinson Bldg.

The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another.

Tide Water Iron Works
HOBOKEN, N.J. U.S.A.

Come to Us If You Need

Hardwood Flooring
Interior Trim
Veneer Doors
Pine Doors
Stairs **Frames**
Sash, etc.

We manufacture the above from Select Stock : :

J. R. Eaton & Sons
Limited
Orillia, Ontario

Sand and Gravel

Lime
Cement
Plaster
Hair
Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones. Office North { 664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.

CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—YARDS—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C. P. R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG
WESTERN CANADA CONTRACTOR AND BUILDER'S GAZETTE
VANCOUVER
Builders' Supplies
Contractors' Machinery
IF YOU REQUIRE BUILDERS IRON WORK CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

CRUSHED STONE

All Sizes

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

ORNAMENTAL IRON WORK WIRE CLOTH AND WIRE GOODS

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES
Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

The Largest Cities and Smallest Towns use

W. E. Seagrave Fire Apparatus

MADE IN WALKERVILLE, ONTARIO

There is a Reason:

The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches.......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts—Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES

(Installed in Toronto).

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite, 55 cents per square foot.

Viterous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 4 compression bath cock ....net	$1.65
No. 4½ Fuller's ....net	2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅛-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

PAINTS AND OILS

(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

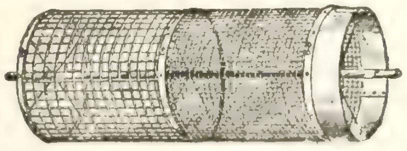
Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, 8cc per gallon.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

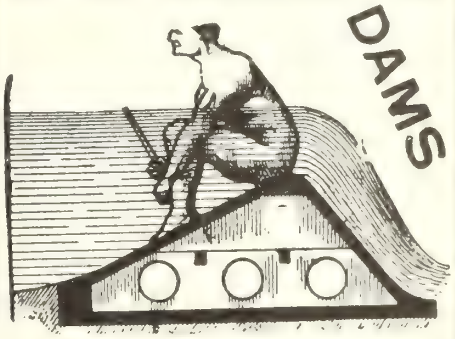
We manufacture
Revolving Screens



and anything in the screen line.
Also railings, wire guards, grills etc.
Electro-plating and all metal finishes.
Estimates Given Send for Catalogue
Crescent Wire & Iron Works
Partridge & Sons KINGSTON

The
Laurentian Granite Co.
Limited
MANUFACTURERS OF
Building Granite, Granite Setts, Curbing, Etc.
Samples Furnished and Prices Quoted on Application
Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.
Bank of Ottawa Bld'g. 224 St. James St. **Montreal**
Bell Tel. M. 4354

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract
The Silica Barytic Stone Company of Ontario, Limited
WALTER MILLS General Manager.
Head Office: INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.
450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc., Always in Stock
OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.
References Given

DOMINION BRIDGE CO.

LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited

WALKERVILLE, ONTARIO

MANUFACTURERS OF

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions. Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y. -	71 Broadway
Baltimore, Md. - -	Continental Trust Bldg.
Boston, Mass. - - -	70 Kilby Street
Chicago, Ill. - - -	McCormick Building
Mexico City, Mex. -	Edificio de "a Mutua"
Philadelphia, Pa. - -	Morris Building
San Francisco, Cal. - -	1505 Chronicle Building
St. Louis, Mo. - -	Commonwealth Trust Building
London, England - -	110 Cannon Street
Steelton, Penna. - -	At Works

W. H. Salter

River Street - TORONTO

Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS and CONTRACTORS

Water Washed Sand
Crushed Granite
Crushed Lime Stone

Prompt Attention Given Orders

Our Dock
Spadina Ave.

PHONES
Office - Adel. 1947
Yard - Adel. 1948

SAND & SUPPLIES, LIMITED
TORONTO

The
Phœnix Bridge & Iron Works Limited
MONTREAL

General Steel Contractors

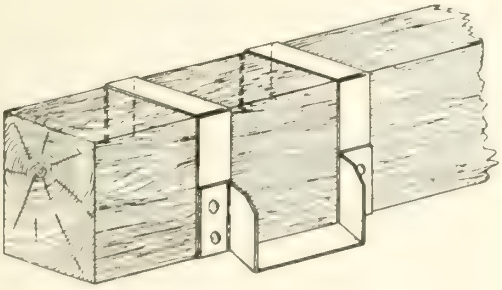
Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

Portland Cement

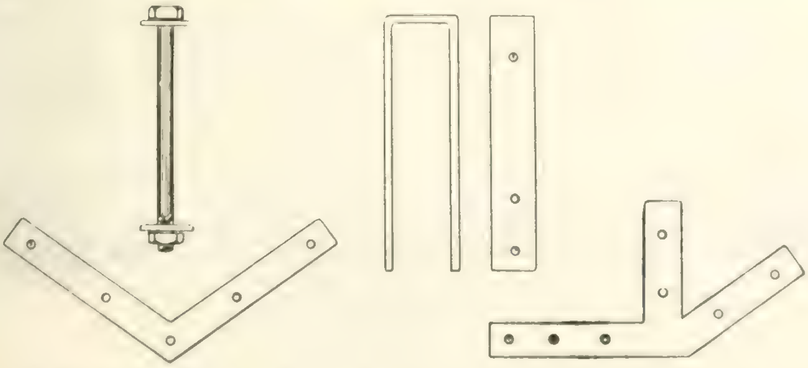
High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

Wm. McNally & Co. - Montreal

The Hamilton Bridge Works Company, Ltd.
HAMILTON, ONT.



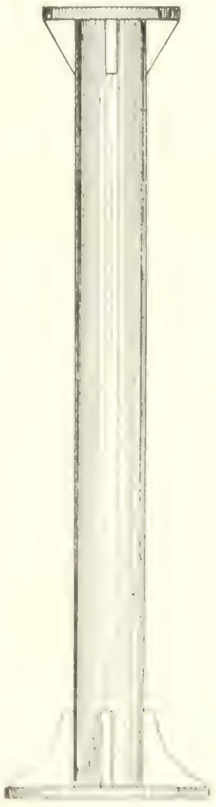
STEEL JOIST HANGERS, Single or Double



IRON FORGINGS, for Wooden Trusses, Apex Straps, Stirrups, Bolts and Rods made to order

Beams,
Angles,
Channels,
Plates,

All Size from 1½ inch to 24 inches, and any length up to 70 feet.



CAST IRON COLUMNS
all sizes and designs

S. S. SELMAN, President
A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners
Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins
Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President.
J. G. Allan Vice-President.
James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The Roofers Supply Co. Limited

Roofing Slate
Red Slate
Green Slate
Mottled Slate
Black Slate
Blackboards Slate
Structural and Electrical Slate
Terra Cotta Tiles
Asphalt Pitch
Tar
Asbestos Sheathing
Building Papers
Tarred Felts
Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

Glass Wired and Rough Rolled
Galvanized Sheets
Black Sheet
Copper Sheet
Tinplates
Canada Plate
Zinc Sheets
Corrugated Iron
Gutters
Pipes
Elbows
Spikes
Nails
Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

CAWTHRA MULOCK, President - - GORDON F. PERRY, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments
Works and Offices: Ashbridge's Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power
Civil Engineers
TORONTO WINNIPEG
Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN
CONSULTING ENGINEERS
STEAM, ELECTRIC AND HYDRAULIC POWER
43 KING ST. WEST - TORONTO

T. Harry Mace
ENGINEER
Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete
630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.
Bowman & Connor
Consulting Municipal and Structural Engineers
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS
CONCRETE AND STEEL BRIDGES AND BUILDINGS
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae
CONSULTING ENGINEER
Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON
ENGINEERS
Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.
405 Dorchester Street East, MONTREAL

John. T. Farmer
MECHANICAL AND HYDRAULIC ENGINEER
427 Coristine Bldg., Montreal

EDW. O. FUCE
Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor
CIVIL ENGINEER
GALT - ONTARIO
Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell
Consulting and Supervising Engineers
Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants
Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.
A. M. Can. Soc. C. E. A. M. Am. Soc. C. E.
Consulting Civil and Municipal Engineer
SPECIALTIES
Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.
315 Pacfic Building, Vancouver B.C.

JAMES C. KENNEDY
Mem. Can. Soc. C.E.
Civil and Hydraulic Engineer
Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.
Suite 413, Pacific Block, Vancouver, B. C.

JOSEPH N. ROULEAU
Submarine Diver
Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.
793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.
Consulting, Civil and Sanitary Engineers
General Municipal Engineering
Specialties: { Waterworks, Sewerage and Electric Lighting.
Winnipeg and Calgary
John Haddin E. L. Miles

Jas. A. McIlwraith
General Contractor
For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.
COLLINGWOOD, ONT.

Allan Keefer
Architect
Ottawa, Ontario

Arthur L. Weeks
Architect
Canada Life Building, Ottawa
Reinforced concrete and steel structures, factories and commercial buildings

TRADE MARK
TAMCO
FOR SALE
"TAMCO" Crushed Stone in all sizes, for all purposes.
"Roman" building stone.
"Milton" pressed bricks.
Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

ROBERT W. HUNT, President
THOS. C. IRVING JR., Vice-Pres.
JAS. W. MOFFAT, Secretary
CHAS. WARNOCK, Treas. & Man.
Robert W. Hunt & Co.
Limited
Bureau of Inspection, Tests and Consultation
Head Office and Laboratories,
CANADIAN EXPRESS BLDG., MONTREAL, QUE.
Branch Offices,
TRADERS BANK BUILDING, TORONTO ONT.
Norfolk House, LAURENCE POUNTNEY HILL, LONDON. E.C.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.
Locomotives and Cars
JOHN J. GARTSHORE
58 Front Street W., TORONTO

Bonds of Suretyship
for Officers and Employees in positions of trust.
Bonds Bid and Supply
in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies.
The Guarrantee Company of North America
The Pioneer Company. *Established 1872*
Head Office - Montreal
Capital and Resources over - $2,000,000
Claims Paid over - - - $2 300,000
NO CLAIMS IN DISPUTE
This Company is not a party to any premium tariff combination.

THE FOUNDATION COMPANY

LIMITED

Bank of Ottawa Building - Montreal, Canada

WE MAKE A SPECIALTY OF

Water Power Construction
Power Plants, Dams

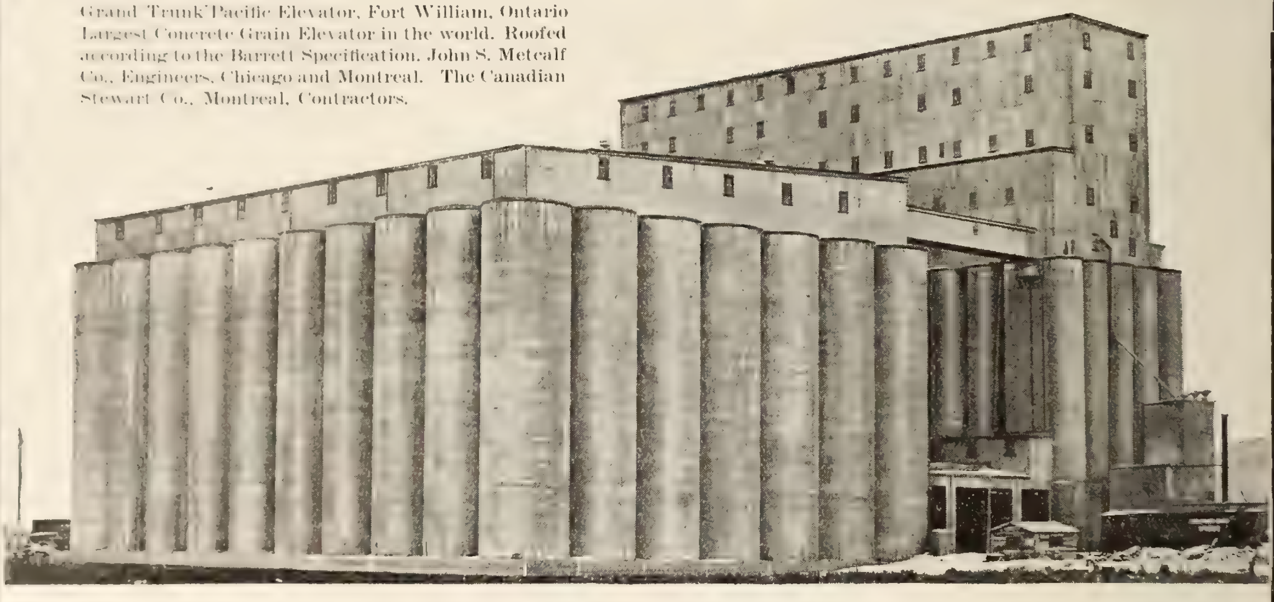
Our Scope

BRIDGE PIERS,	SEAWALLS,
MINING SHAFTS,	WHARVES, QUAYS,
TUNNELS,	DAMS,
WATER POWER CONSTRUCTION,	LIGHTHOUSES,
POWER PLANTS	HEAVY BUILDING FOUNDATIONS.

WITH A LARGE EQUIPMENT OF PLANT AND A WELL-ORGANIZED FORCE WE ARE PREPARED AT ALL TIMES TO UNDERTAKE DIFFICULT WORK ON THE SHORTEST NOTICE

We Invite Inquiries in Reference to Cost and Design of Difficult Foundation Work.

Barrett Specification Roofs



Grand Trunk Pacific Elevator, Fort William, Ontario Largest Concrete Grain Elevator in the world. Roofed according to the Barrett Specification. John S. Metcalf Co., Engineers, Chicago and Montreal. The Canadian Stewart Co., Montreal, Contractors.

Largest Concrete Grain Elevator in the World

THE accompanying illustration shows *the largest concrete grain elevator in the world.*

It has a capacity of 2,500,000 bushels, and is part of a plant which, when completed, will be capable of storing one-third the wheat crop of Western Canada. This section cost $1,250,000. Its roof area 75,000 square feet, is covered with a Barrett Specification Roof.

The reasons for this choice of roofing were:

First—*Low Maintenance Expense.* As a Barrett Specification Roof never needs painting and will last 20 to 30 years, the maintenance expense may be said to be nothing.

Second—*Low Unit Cost.* For a roofing, the unit cost is the cost per square foot per year of service. Dividing the cost of a Barrett Specification Roof over, say 20 years (its probable life), gives the very low unit cost of about ¼c. per foot per year. This is far below that of any other type of roofing known.

The foregoing reasons explain the enormous popularity of Barrett Specification Roofs on permanent structures of all kinds.

Copy of the Barrett Specification on request. Address nearest office.

The Paterson Manufacturing Co., Limited

Montreal Toronto Winnipeg Vancouver, St. John N.B. Halifax, N.S.

Canada Wire & Cable Co., Ltd.

Announce the Opening of their New

Wire, Cable, and Wire Rope Works

at Toronto

The Product of our Electrical Wire Department will include

Electrical Wires and Cables

in Aluminum and Copper

BARE AND INSULATED—FOR ALL PURPOSES.
GALVANIZED IRON TELEGRAPH AND TELEPHONE WIRE

The Product of our Wire Rope Department will include:

- Standard Hoisting Ropes
- Semi-Pliable, Pliable and Extra Pliable Ropes
- Improved Patented Crucible Cast Steel Hoisting Ropes
- Improved Mild Steel (Siemens-Martin) Elevator Ropes
- Transmission and Colliery Ropes
- Tiller Ropes
- Galvanized Steel Hausers
- Galvanized Strand 2, 3 and 7 wire for Guys
- Ropes to any Standard Specification

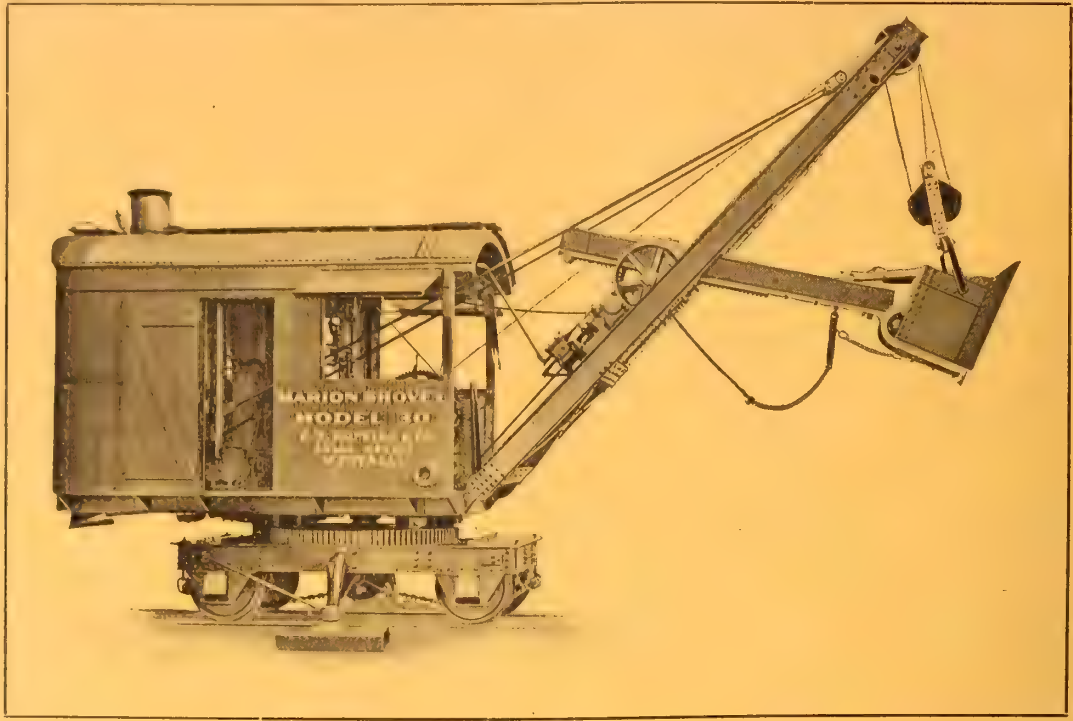
Literature ready for distribution at an early date. Write for it

CANADA WIRE & CABLE CO.

LIMITED

Factory at
1160-70 Dundas Street
Toronto

HEAD OFFICE
KENT BUILDING, 156 YONGE STREET,
TORONTO



"MARION"

Revolving Steam Shovels

Especially designed for

BRICK YARDS
ORE DOCKS
THOROUGH-CUT WORK
CONTRACTORS USE IN ROAD WORK
CELLAR EXCAVATING
LOADING COAL
Any similar operation where it is desired to deposit material within full circle swing.

Supplied with

½—⅝—¾—1¼ **cubic yard Dippers**

"MARION" Revolving Shovels are the most extensively used revolving shovels there are on the market today, which is abundant proof of their superiority in design, construction workmanship and efficiency over other makes of this type of shovel. Operated by one man. Supplied with Traction Wheels if desired.

Let us send you catalogue

F. H. Hopkins & Co.

MONTREAL
Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.
GORMAN, CLANCEY & GRINDLEY, LTD., Calgary and Edmonton Agents

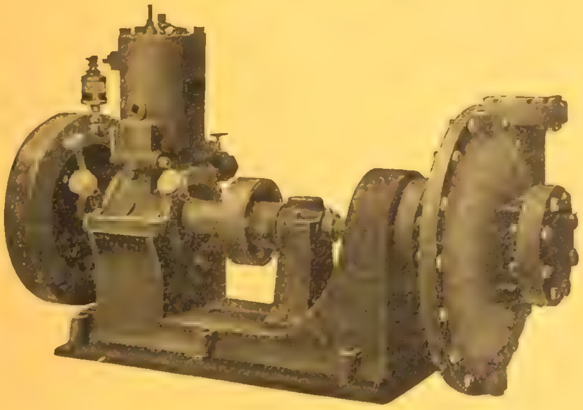
Vol. 25 Toronto, August 30, 1911 No. 35

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

We manufacture Steam and Power Pumps, Condensers, Travelling Cranes, Etc.



Write for Catalogue

The **Smart-Turner Machine Company** Limited
HAMILTON, ONTARIO

"MADE IN CANADA"

Bent Glass

Made in all Kinds of Glass on Short Notice

Large Bent Plate Glass for Shop Fronts a Specialty

The Toronto Plate Glass Importing Company, Limited
(HILL & RUTHERFORD, Managing Directors)
Head Office and Works: 91 to 133 Don Roadway
TORONTO

Gives a Bright Appearance

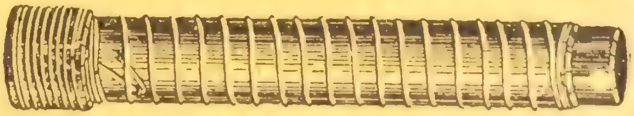
"Queen's Head"
CANADA

Galvanized Iron

One Contractor says: "It is a pleasure to look at "QUEEN'S HEAD" work

John Lysaght, Limited
Makers
Bristol, Newport

A. C. Leslie & Co., Limited
MONTREAL
Managers, Canadian Branch



Continuous and Machine Banded Wood Stave
WATER PIPE
RESERVOIR TANKS
for city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, etc. One-half the cost of Iron Pipe and better.

Pacific Coast Pipe Co., Limited
P. O. Box 563 Vancouver, B. C.
Office and Factory, Granville St., near High Bridge
WRITE FOR CATALOGUE
Full Particulars and Estimates Furnished

Crushing and Screening Plants

For Good Roads, Railroad Ballast, Concrete Making, and General Contracting, using the Farrel Style "B" Crusher, "The Standard of the World."

Catalogues mailed to any address on request

The Jenckes Machine Co., Limited

General Offices: Sherbrooke, Que.

Works: Sherbrooke, Que. St. Catharines, Ont.

Sales Offices:—Sherbrooke, St. Catharines, Montreal, Cobalt, Rossland and Vancouver

EVERY JOLT AND JAR

of a heavily loaded derrick produces thousands of pounds of stress on certain parts.

"AMERICAN" DERRICKS

ARE SAFE AND STRONG

They are designed by skilful engineers and built of material that for 28 years has stood the severest shocks and strains.

SEND FOR GENERAL CATALOG

American Hoist & Derrick Co.

ST. PAUL, U.S.A.

Gorman, Clancey & Grindley, Edmonton and Calgary, Alta. and Nelson, B.C.
Vancouver Machinery Depot, Ltd., Vancouver, B.C.
Stuart Machinery Co., Ltd., Winnipeg, Man.

More and more frequently Canada Cement is being named in specifications because Builders and Architects keep these facts in mind

Uniformity of Quality, Standard Weight

In order to assure satisfactory results to architects and engineers in uniformity of strength, fineness, color and setting qualities, all our Cement is made under the supervision of our General Superintendent and Expert Chemist to come exactly up to our fixed standard specification. Each barrel is guaranteed to weigh full 350 pounds (Gross), the maximum cement barrel weight.

Delivery

Our system of mills advantageously situated at Exshaw, Alta.; Calgary, Alta.; Port Colborne, Ont.; Shallow Lake, Ont.; Belleville, Ont; Marlbank, Ont.; Lakefield, Ont.; Hull, Que.; and Montreal, Que., gives us ample shipping facilities to ensure prompt delivery.

Price

Being in competition with and controlled by the market of such materials as steel, wood, clay products, and natural stone, the price of cement is governed by conditions. At present these permit of a higher grade material at a fair price.

Adaptability

Reinforced concrete construction has become the chief factor in the construction of various classes of important buildings where strength, durability, fire-proofing and economy are necessary. The modern reinforced concrete structure is a monolith, quite as much as if its various rooms and passages had been carved out of solid rock. To this is added the strength of reinforcing materials. This form of construction cannot fail to increase in favor.

Concrete Block Machinery

By avoiding a repetition of pattern, which is so destructive to true architectural design and by the use of a mixture of one to two, cement and sand, for "facing", a block equal in hardness and durability to cut stone, in either "tooled" bush hammered or "Rock face" may now be produced at but little more than half the cost.

CANADA CEMENT COMPANY LIMITED
PORTLAND
CANADA
CEMENT
MONTREAL.

Canada Cement Company, Ltd.

MONTREAL - TORONTO - WINNIPEG - CALGARY

What Do You Care

about the amount of salary you pay your Manager or Superintendent, as long as he is able to give you many times its value in service?

You can apply this also to any other employee or to any tool or machine on your job.

A Smith Mixer

will repay you over and over again for the original outlay.

They last the longest—are easiest on repairs—and mix quicker and better than any other.

Montreal, 318 St. James St.
Toronto, 73 Victoria St.
Cobalt, opp. Right of Way Mine.

MUSSENS

SMITH MIXERS

Ve know them

You know them

Everybody knows them

AS THE BEST

Ve make them in Montreal and we know what enters into their construction. We see that only the best material and workmanship are used. This point alone means dollars to any user.

LIMITED

Winnipeg, 259-261 Stanley St.
Calgary, Samis Block
Vancouver, Mercantile Bldg.

CLASSIFIED INDEX OF ADVERTISERS

Asbestos Goods (all descriptions) Page
Asbestos Mfg Co ... 27

Architects
Keeter, Allan ... 88
Weeks, Arthur I ... 88

Architectural Iron Work
Canada Wire Goods Mfg. Co. ... 82
Dennis Wire & Iron Works ... 77
Meadows Co., Geo. B ... 35

Air Compressors
Escher Wyss & Co ...

Asphalt Plant
East Iron Machine Co. ... 73

Buckets
American Hoist & Derrick Co. ... 2
Sackett Screen & Shute Co ... 78

Belting
Federal Engineering & Supplies, Ltd ... 80

Brick Chimneys
Heinicke, H. R ...

Blowers
Sturtevant Co., B. F. ... 72

Boilers
Inglis, John ... 67
Jenckes Machine Co. ... 2
Leonard & Sons, E ... 73
Marsh & Henthorn ... 71
McDougall Caledonian Iron Works ... 69
Mussens Limited ... 4
Waterous Engine Works Co. ... 77

Brick Machinery and Supplies
Berg Mfg. Co. ...
Whitehead, John ... 10

Brick
American Enamelled Brick Co. ...
Don Valley Brick Works ... 7
Hamilton Pressed Brick Co. ...
Milton Pressed Brick Co. ... 90
Port Credit Pressed Brick Co. ... 86
Toronto Pressed Brick Co. ... 18

Brickmaker's Supplies
Sackett Screen & Shute Co. ... 78

Bridges (Steel)
Attica Bridge Co. ...
Canadian Bridge Co. ... 84
Cleveland Bridge Co. ... 84
Des Moines Bridge and Iron Co. ... 93
Dickson Bridge Works ... 91
Dominion Bridge Co ... 84
Hunter Bridge and Boiler Works ... 79
National Bridge Co. ... 72
Phoenix Bridge and Iron Works ... 85
Pennsylvania Steel Co. ... 84
Sarnia Bridge Co ... 72

Cement
Alsen Portland Cement Co ... 74
Britnell & Co ... 80
Bremner, Alex ... 87
Canada Cement Co ... 3
McNally & Co., W. ... 85
Morrison & Co., T. A. ... 88
Rogers, Alfred Limited ... 9

Concrete Pipe
Dominion Concrete Co. ... 22
Lock Joint Pipe Co. ... 17

Cement Waterproofing
Ceresit Waterproofing Co. ...
Chillas-Black ... 19
Hercules Waterproofing Cement Co
Mansbendel, F. P ... 76

Cranes, Travelling & Locomotive Page
American Hoist & Derrick Co. ... 2
Armstrong, H. J. ...
Brown Hoisting Machinery Co. ... 79
Males Co ... 64
Parker, S. E. ... 20
Willis Shaw Machinery Co ... 64

Conduits
Conduits Co., Limited ... 87

Crushed Stone and Granite
Sand and Supplies ... 85
Smyth & Ryan ... 91

Concrete Mixers and Machinery
Canada Foundry Co ... 20
Chain Belt Co ... 79
General Machinery Co. ...
Gould, Shapley & Muir ... 16
Hopkins & Co., F., H. ... 96
Ideal Concrete Machinery Co. ...
Jenckes Machine Co. ... 2
London Concrete Machinery Co. ... 35
Milwaukee Mixer Co. ... 16
Mussens Limited ... 4
Morrison & Co., T. A. ... 88
Municipal Engineering & Contracting ... 73
Richert Mfg. Co. ... 25
Steel and Radiation (Cement Gun) ... 23
Standard Scale ... 35
Vining Bros. ... 91
Wettlaufer Bros. ... 92

Contractors' Plant
American Hoist & Derrick Co. ... 2
Acme Eqpt. & Engineering Co. ... 75
Beatty & Sons, M. ... 6
Hepburn, John T. ... 12
H. & E. Lifting Jack Co. ...
Hopkins & Co., F. H ... 96
International Marine Signal Co. ... 8
Willis Shaw Machinery Co. ... 64
Marsh & Henthorn ... 71
Montreal Locomotive Works ...
Mussens Limited ... 4
Parker, S. E ... 20
Richert Mfg. Co. ... 25
Ritchie Contractors Supply Co. ...
Tiffin Wagon Co. ... 72
Troy Wagon Works ... 26
Watson Wagon Co ...

Crushers (Stone and Rock)
Berg Machinery Co. ...
Hopkins & Co., F. H. ... 96
Jenckes Machine Co. ... 2
London Concrete Machinery Co. ... 35
Males Co. ... 64
Mussens Limited ... 4
Morrison & Co., T. A ... 88
Willis Shaw Machinery Co ... 64

Corrugated Iron
Galt Art Metal Co. ... 89
Metallic Roofing Co. ... 71
Metal Shingle and Siding Co. ...
Ormsby, A. B., Limited ... 11
Roofers Supply Co. ... 87

Contractors
Bennett, Robt. ...
Foundation Co ...
Holmes, Fred. ... 73
McIlwraith, Jas. A. ... 83
Nadel & Adler ... 88
Norcross Bros. Co. ... 32
Wells & Gray ...

Coal Handling Apparatus
American Hoist & Derrick Co ... 2
Down Draft Furnace Co. ... 75
Parker, S. E. ... 20

Derricks and Derrick Fittings Page
American Hoist & Derrick Co. ... 20
Parker, S. E. ... 20

Drills
Beatty & Sons M ... 6
Canadian Rand Co. ... 28

Drilling Contractors
Harvey, J. ... 83

Dredges
Beatty & Sons, M ... 6
Males Co. ... 64
Willis Shaw Machinery Co ... 64

Dry Kilns
Sturtevant Co., B. F. ... 72

Electrical Apparatus, Motors
Canada Ford Co. ... 36

Engines
Canadian Boving Co. ... 89
Inglis, John ... 67
Jenckes Machine Co. ... 2
Leonard & Sons, E ... 73
Mussens Limited ... 4
Sturtevant Co., B. F. ... 72
Waterous Engine Works Co. ... 77

Engineers (Civil) and Mechanical
Barber & Young. ... 88
Chipman & Power ... 88
Bowman & Connor ... 88
Farmer, John T. ... 88
Fuce, Edw. O. ... 88
Galt Engineering Co., John ... 88
Hancock, H. Syd. ... 88
Inglis, John ... 67
Kennedy, Jas. C. ... 88
Lea & Ferguson ... 88
Mace, T. Harry ... 88
Mitchell, C. H. ... 88
McRae, John B. ... 88
Moore & Scollan ... 88
Taylor, James ... 83

Exhaust Heads
Sturtevant Co., B. F. ... 72

Filters
American Water Softener Co. ... 90

Floor Surfacers
Schleuter, M. T. ... 93

Friction Clutches
Berg Machinery Co. ...

Field Instruments
Consolidated Optical Co ... 92
Gurley, W. & L. E. ... 69

Fire Brick
Gibb, Alexander ... 91

Fire Apparatus
Morrison & Co T. A. ... 88
Seagrave, W E. ... 80

Fireproof Doors and Windows
Douglas Bros. ... 76
Mussens Limited ... 4
Ormsby, A. B. ... 11
Steel and Radiation ... 23

Granite and Marble
Laurentian Granite Co. ... 83
Missisquoi Marble Co. ... 81
Smith Marble & Construction Co. 89

Glass Page
Consolidated Plate Glass Co. ...
Hobbs, Mfg. Co. ... 70
Luxfer Prism Co. ... 91
Toronto Plate Glass Importing Co. 1-76

Hoists (Hand Gasoline and Electric
Parker, S. E. ... 20

Heating Apparatus
Jenckes Machine Co. ... 2
Leonard & Sons, E. ... 73
Steel and Radiation ... 23

Hoisting Machinery
American Hoist & Derrick Co. ... 2
Beatty & Sons, M. ... 6
Canada Ford Co. ... 36
Inglis, John ... 69
Jenckes Machine Co. ... 2
Hopkins & Co., F. H. ... 96
London Gas Power Co. ... 71
Marsh & Henthorn ... 71
Mussens Limited ... 4
Parker, S. E. ... 20
Sturtevant Co., B F. ...

High Pressure Pipe Lines
Escher Wyss & Co. ...

Hydrants
Canada Iron Corporation ... 87
Gartshore-Thomson Pipe Co. ... 86
Kerr Engine Co. ... 33
Smyth & Ryan ...

Incinerators
Toronto Furnace Co. ... 29

Interior Finish and Doors
Anglin, S. ... 74
Brennen & Sons, M ... 78
Batts Limited ...
Canada Office & School Furniture Co 93
DeLaplante, Ltd. ... 81
Bryan Mfg. Co. ... 71
Eaton & Sons, J. R. ... 81
Elmitt Lumber Co. ... 80
Georgian Bay Shook Mills ...
Rhodes Curry & Co. ...
Wilson Bros. ... 94

Locomotives
Montreal Locomotive Works ... 34

Metal Form for Concrete
Reichert Mfg. Co. ... 25

Lime
Christie, Henderson & Co. ... 82
Jamieson Lime Co. ...
Ontario Lime Association ... 29

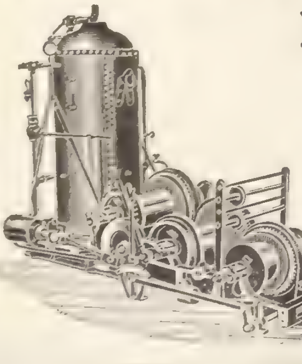
Metal Lath
Galt Art Metal ... 89
Greening Wire Co., B ... 70
Metallic Roofing Co. ... 71
Noble C. W. ... 74
Steel and Radiation ... 23

Meters
Hopkins & Co., F. H. ... 96
McDougall Caledonian Iron Works 69
Neptune Meter Co. ... 25

Paving and Paving Materials
Dominion Carbolineum Works ... 14
Metropolitan Paving Brick Co. ...
Ontario Asphalt Block Co. ... 74
Shawmut Paving Brick Co. ...
Silica Barytic Stone Co. of Ontario 83

(Continued on page 10)

M. Beatty & Sons, Limited Welland, Ontario, Canada



Dredges - Ditchers - Derricks
Steam Shovels
Steel Dump and Deck Scows
Submarine Rock Drilling Machinery
Mine Hoists, Hoisting Engines
Centrifugal Pumps, Clam Buckets
Steel Skips, Coal and Concrete Tubs
and other Contractors' Machinery

Don Valley Bricks

On a 20,000,000 Contract

The largest brick contract ever let in Canada

Bird's eye view of the Toronto General Hospital as it will appear upon completion.
Architects, Darling & Pearson.

The Terra Cotta Fireproofing for the Toronto General Hospital was also manufactured by us

THE DON VALLEY BRICK WORKS

Head Office: 36 Toronto St., TORONTO

Montreal Agent: **David McGill, 206 Merchants Bank Chambers**

Engineers and Builders

OF ALL

Steel and Iron Structures

Mill Buildings our Specialty. Roofs, Bridges, Columns and Girders of Every Description. Large Stock of Structural Shapes always on hand for immediate shipment. Ask for Designs and Estimates on your Work.

International Marine Signal Company Limited

OTTAWA, CANADA

Block Stone, Dimensions, Random, Head Sills, Shoddy, Stone Sawing

Sackville Freestone Co., Limited, Sackville, N. B.

WRITE US FOR QUOTATIONS

PORTLAND CEMENT

Plants	Atwood, Durham, Hanover, Kirkfield, Orangeville, Owen Sound, Wiarton.
Facilities	Our mills are thoroughly equipped and have an ample capacity and good storage, which enables us to ship all orders promptly. They are so distributed as to have every advantage of railway and water connection. We are particularly well situated to supply Ontario and Western Canada.
Packages	Every precaution is taken to provide the highest character packages.
Tests	Throughout the entire manufacture of our cement the greatest care is exercised to keep the product at its high standard. The care exercised in this regard has created a reputation for reliability among the users of cement who do not have the time or opportunity to test each shipment, and who consequently rely largely upon the manufacturer.
Adaptability	Our cement is adapted for all purposes where high grade cement is desired, such as in foundations for buildings and heavy machinery, tunnel work, cisterns, cellar floors, sidewalks, pavements, curbing, artificial stone, conduits, sewers, reservoirs, bridge piers and concrete work of all kinds.
Information	Architects and Engineers will be assisted with any information desired and we will co-operate in making any tests of our cement on request.

ALFRED ROGERS
Limited
28 King Street West, TORONTO, CAN.

Plaster

	Page
Albert Mfg. Co	
Britnell & Co	82
Calkins, H. W.	86

Portable Saw

Canadian Fairbanks	22

Pipe

American Spiral Pipe Works	75
Canadian Pipe Co	86
Dominion Wood Pipe Co.	12
Dominion Concrete Co.	22
Gartshore-Thomson Pipe Co.	86
Lock Joint Pipe Co.	17
Munderloh & Co	14
National Iron Works	87
Pacific Coast Pipe Co.	1
Pedlar People	30
Steel Co. of Canada	19
Steel and Radiation	23

Plumbers' Supplies

Standard Ideal Co.	36

Power Engines

Inglis Co., John	67

Paints and Varnishes

Paterson Mfg. Co.	

Pile Driving Machinery

American Hoist & Derrick Co.	2
Lincoln Construction Co.	80

Pumps and Pumping Machinery

American Well Works	24
Beatty & Sons, M.	6
Cook, A. D.	
Escher Wyss & Co.	
Hopkins & Co., F. H.	96
Inglis Co., John	67
Leonard & Sons, E	73
McDougall Caledonian Iron Works	69
Mussens Limited	4
Ontario Wind Engine & Pump Co	73
Smart-Turner Machine Co.	1
Waterous Engine Works Co	77

Roofing Materials

	Page
Asbestos Mfg. Co.	27
Galt Art Metal Co.	89
Metallic Roofing Co.	71
Metal Shingle & Siding Co.	
Noble, Clarence W	74
Paterson Mfg. Co.	
Philip Carey Co	78
Roofers Supply Co	87
Standard Paint Co.	

Railway Supplies

Gartshore, John J.	88
Hopkins & Co., F. H.	96
Mussens Limited	4

Reinforcements, Concrete and Steel

Ambursen Hydraulic Construct'n Co.	83
Canada Wire Goods Mfg. Co.	82
Greening Wire Co., B.	70
Steel Co. of Canada	19
Steel & Radiation	23
Trussed Concrete Steel Co.	81
Turner, C. A. P.	94

Road Machinery

Hamilton Machinery Co.	15
Morrison & Co., T. A	88
Mussens Limited.	4
Western Wheeled Scraper Co.	11

Shovels (Steam)

Beatty & Sons, M.	6
Canada Foundry Co.	20
Hopkins & Co., F. H.	96
Montreal Locomotive Works	34
Mussens Limited	4
Males Co.	64
Willis Shaw Machinery Co.	64

Shingles,—Asbestos

Asbestos Mfg. Co.	27

Stone

Anderson, Geo	18
Britnell & Co.	82
Brodie, Jas.	93
Christie, Henderson & Co.	82
Consolidated Stone Co.	90
Contractors' Supply Co.	82
Corinthian Stone Co.	
Crushed Stone, Limited	73
Doolittle & Wilcox	87
Hagersville Contracting Co.	11
Laurentian Granite Co.	83
McMillan & Son, R.	
Morrison & Co., T. A.	88

Stone

	Page
Myers, Oakley	93
Roman Stone Co	13
Sackville Freestone Co.	8
Sand & Supplies	85
Thames Quarry Co.	80

Sand and Gravel

Rogers Supply Co	31
Sand & Supplies	85
Smyth & Ryan	91
York Sand and Gravel Co.	91

Steam Apparatus

Sturtevant Co., B. F.	72

Submarine Diver

Rouleau, Joseph N.	88

Structural Iron and Steel

Dominion Bridge Co.	84
Franklin Steel & Iron Co.	
Steel Co. of Canada	19
Pennsylvania Steel Co.	84
Phoenix Bridge & Iron Works	85
Reid & Brown	83
Salter, W. H.	85
Steel & Radiation	23
Sarnia Bridge Co	72

Sewer Pipe

Britnell & Co	82
Canada Iron Corporation	86
Dominion Sewer Pipe Co.	21
Gartshore Thomson Pipe Co.	86
Hamilton & Toronto Sewer Pipe Co.	20
Lock Joint Pipe Co.	17
National Iron Works	87
Ontario Sewer Pipe Co.	21
Standard Drain Pipe Co.	21

Slate

Roofers Supply Co.	87

Steel Shingles and Ceilings

Galt Art Metal Co.	89

Smoke Stacks

Leonard & Son, E.	73

Safes and Vaults

Taylor, J & J	78

Tents

Woods Limited	25

Testing and Inspection Bureau

	Page
Hunt & Co., Robt. W.	88

Tiles

Smith Marble & Construction Co.,	89

Terra Cotta

Toronto Plate Glass Importing Co.	76

Tanks and Stand Pipes

Berg Machinery Co.	
Inglis, John	67
Jenckes Machine Co.	2
Leonard & Sons, E.	73
Marsh & Henthorn	71
McDougall Caledonian Iron Works	69
Ontario Wind Engine & Pump Co.	73

Trade Journals

Castellanos A. W.	93

Valves

Canada Iron Corporation	87
Gartshore-Thomson Pipe Co	86
Kerr Engine Co.	33

Ventilating and Heating Apparatus

Sturtevant Co., B. F.	72

Water Softeners and Filters

Berg Machinery Co.	
American Water Softener	90

Wire Rope

Canada Wire and Cable Co.	95
Greening Wire Co., B.	70
Smith, Thos. & Wm.	
Steel Co. of Canada	19

Wire Guards and Screens

Canada Wire Goods Mfg. Co.	82
Crescent Wire Iron Works	83
Greening Wire Co B.	
Sackett Screen & Shute Co	
Steel and Radiation	23

Water Wheels

McDougall Caledonian Iron Works	69
Canadian Boving Co.	89

Water Turbines

Escher Wyss & Co.	

Wires and Cables

Canada Wire and Cable Co.	95

Wheelbarrows

Sackett Screen & Shute Co.	78
Parker, S. E.	20

John Whitehead & Co.

LIMITED

Albert Works: PRESTON, ENGLAND

Makers of

Reliable

Efficient

Tile and Pipe Machinery, and

CLAY WORKING PLANT

for all classes of Clays and Shales.

INQUIRIES SOLICITED. CATALOGUES POST FREE.

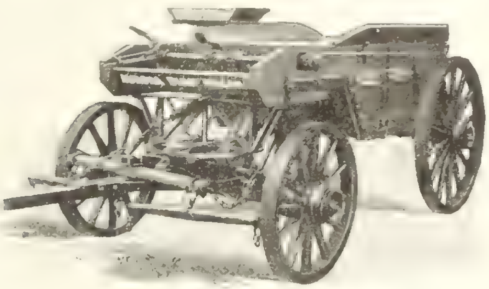
Established over 75 years. TELEGRAMS: Brictile, Preston

Representatives in Canada: Messrs. Chambers & Simpson, Engineers, Toronto

MUNDERLOH & Co Ld.
MONTREAL.
SEAMLESS STEEL TRACTION AND LIGHTING POLES.
MANNESMANN SEAMLESS STEEL PIPES. FOR GAS & WATER MAINS.
IN LENGTHS UP TO 40 FEET.
AN IMPROVEMENT ON CAST IRON.
ALL PIPES TESTED 75 ATMOSPHERES BEFORE LEAVING WORKS.
WRITE US FOR ILLUSTRATED BOOKLET.
SEND US YOUR ENQUIRIES.
WE ARE SOLE AGENTS IN CANADA FOR—
MANNESMANN TUBES.
FOR ALL PURPOSES.

THE STRENGTH OF OAK WITH 40 PER CENT SAVING IN WEIGHT

That's the saving effected by constructing the bed of selected Washington Fir, and its just one of the many reasons why lightest weight is combined with greatest strength in the



"Aurora" Dump Waggon

Built low for easy loading, coupled short for lightest draft only 7 feet 4 inch wheel base.

Chains entirely outside of bed, direct pull of chain on doors and length of chains adjustable.

Slotted hinges on doors give vertical movement, preventing installing team on dump.

Study its sturdy construction—its mechanical, labor-saving and dependable qualities. Catalog for the asking.

Western Wheeled Scraper Co.
AURORA, ILL.

ANY DESIGN CARRIED OUT

We give you any design you may detail in our **Kalameined Clad Doors.** We also have a large number of stock designs that make a superior door. For **architectural effect** and **real fire protection** it would be very difficult to get anything in the door line that could surpass our **machine made Kalameined Clad Doors.** Specify our door for real satisfaction. We can give you real copper covered doors, coppered doors, german-silver covered doors or any covering you desire.

A. B. Ormsby, Limited
Experts in Fireproof Windows and Doors
Factories: - - Toronto and Winnipeg

"HAGERSVILLE"
CRUSHED STONE
FOR
CONCRETE AND MACADAM

The Toughest Stone for
Macadam in Ontario.

Offices and Quarries : **HAGERSVILLE, ONT.**

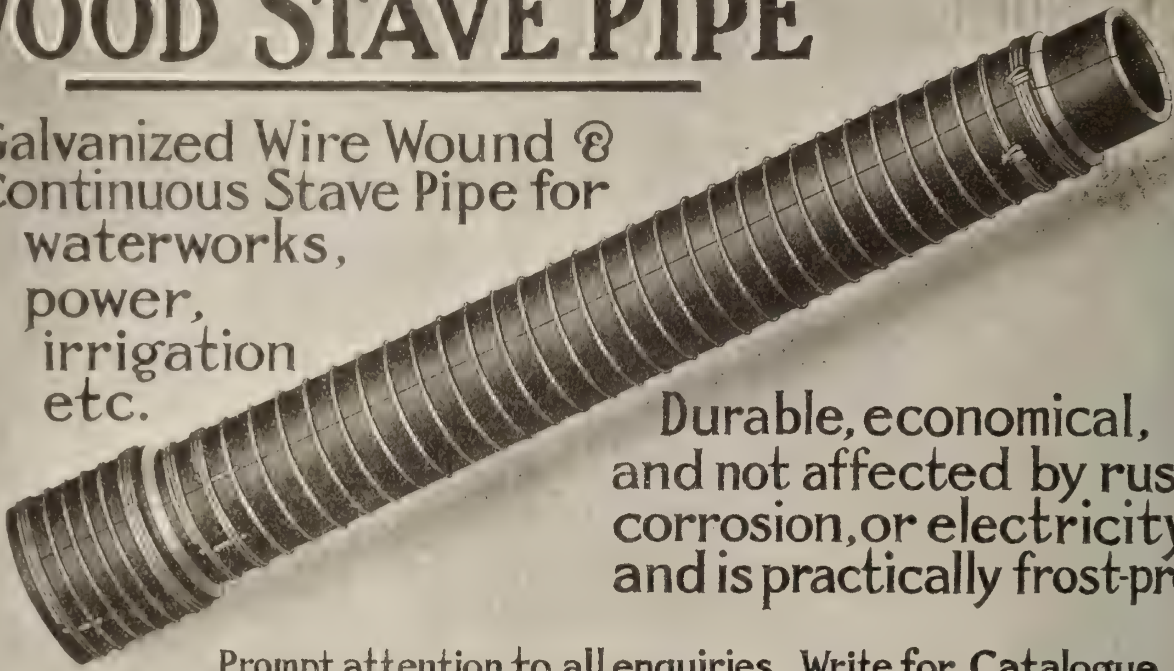
SALES AGENTS FOR TORONTO :
Sand & Supplies, Limited,
Foot of Spadina Ave.

Stone delivered on G. T. R., M. C. R., C. P. R.
and T. H. & B. Railways.

Hagersville Contracting Co.
Limited
Hagersville - Ont.

WOOD STAVE PIPE

Galvanized Wire Wound &
Continuous Stave Pipe for
waterworks,
power,
irrigation
etc.



Durable, economical,
and not affected by rust,
corrosion, or electricity,
and is practically frost-proof.

Prompt attention to all enquiries. Write for Catalogue.

The Dominion Wood Pipe Company, Limited
New Westminster, B.C.

Another Derrick Would Help You Out

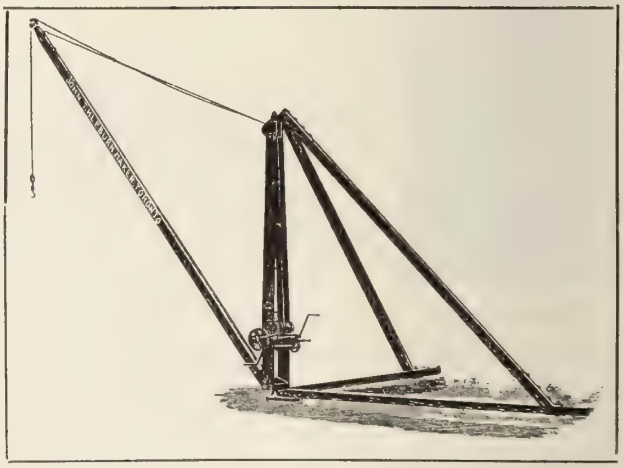
Two Derricks are better than one—when you have a lot of work to do, and little time to do it

If you are already using

Hepburn Scotch Derricks

you know the kind of stuff they are made of—only the best of materials throughout. You know how they are put together—to stand the hardest of fair usage. And best of all—you know what they can do.

If you have more work on hand than you know how you are going to get through before the end of the season—another Derrick would help you out.



Place your order at once and we can promise you prompt delivery

JOHN T. HEPBURN, 18-40 Van Horne Street, **Toronto, Canada**

Roman Stone

(Trade Mark Registered)

Ontario Motor Car Company Building, Bloor Street East, Toronto

Roman Stone has been used in many of Canada's largest buildings. It is made in the same way as natural stone only we use a much stronger cement than nature. Roman Stone is the same quality throughout and when used with a red pressed or buff tapestry brick produces an effect hard to beat.

The Roman Stone Company

Limited

Head Office: 504-5 Temple Building, TORONTO

E. C. Arnoldi,
26 Sparks St., Ottawa

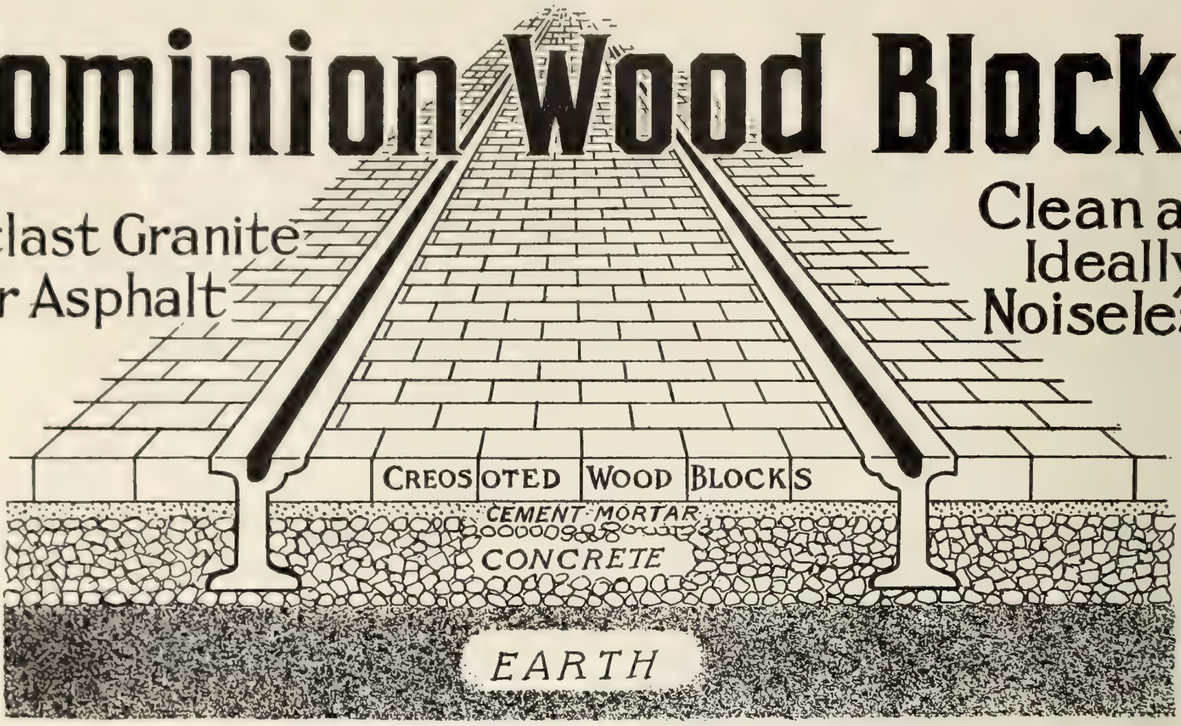
A. L. Bedson,
Canada Life Bldg., Winnipeg

T. A. Morrison & Co.,
204 St. James St., Montreal

Dominion Wood Blocks

Outlast Granite
or Asphalt

Clean and
Ideally
Noiseless



Dominion Wood Blocks

make the most durable pavement for all classes of service, from the lightest wear of boulevard vehicles to the grinding of the heaviest trucking traffic. It is the one pavement that won't need the annual attention of the repair gang and will pass out of reserve in perfect condition.

Don't put your money in a pavement that will need patching before the final payment is made on the assessment.

The Dominion Creosoting Co., Ltd.

SUCCESSORS TO

Dominion Carbolineum Works
LIMITED
Vancouver, B.C.

"CHAMPION"

Road and Contractors' Machinery

makes contracting a business, not a gamble

There is no element of uncertainty as to just what you can look for from "CHAMPION" Machinery. It does its work and stands up to it—no expensive break-downs—no costly loss of time—no frequent tinkering—only the ordinary wear and that at a minimum.

In these days of competition, profit margins are not so large that anyone wants to run the risk of unexpected delays and expense. And yet everybody knows that unreliable machinery can easily sap away all the profit.

"CHAMPION" Road Machinery has exclusive features possessed by no others.

"CHAMPION" Road Machinery is made of the highest grade materials in the finest factory in the country devoted to this line.

The famous "CHAMPION" Rock Crushers with their double motion jaw, "CHAMPION" Elevator and Graders and various other machines have made this reliable line

"Standard in Canada for 20 Years"

Write for our catalogs telling us in which machine you are interested.

SPECIAL: Send all orders for repair parts direct to the Hamilton Machinery Co. and save 3 to 5 days.

American Road Machine Company, of Canada, Limited

GODERICH, ONT.

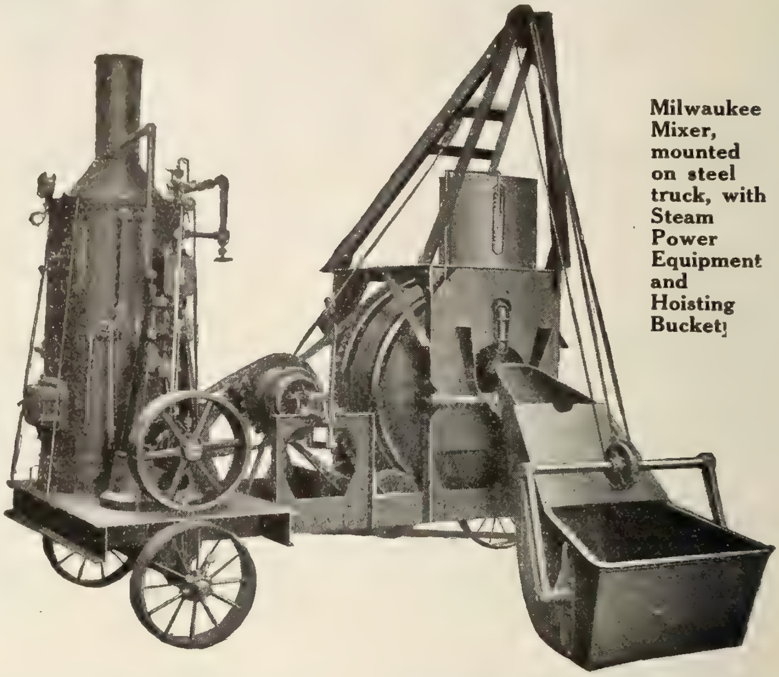
Address all Correspondence to

THE HAMILTON MACHINERY CO., LIMITED, HAMILTON, ONT.

(Sole Selling Agents)

Milwaukee Concrete Mixer

Rosebery's Unequaled Proposition and one that is booking the orders. Write for 1911 Catalogue. Just out.



Milwaukee Mixer, mounted on steel truck, with Steam Power Equipment and Hoisting Bucket;

OUR PROPOSITION

WE will put a Milwaukee Mixer on your work for a period of five days. You are at liberty to test it thoroughly in every kind of work. If, at the expiration of this time, you are not fully convinced that it is all we claim and superior to any concrete mixer in the market, return it to us and we will pay the freight both ways.

No firm ever made, or can make, a more straightforward offer than this, as it will not cost you a cent if we fail to convince you of the superiority of the MILWAUKEE CONCRETE MIXER.

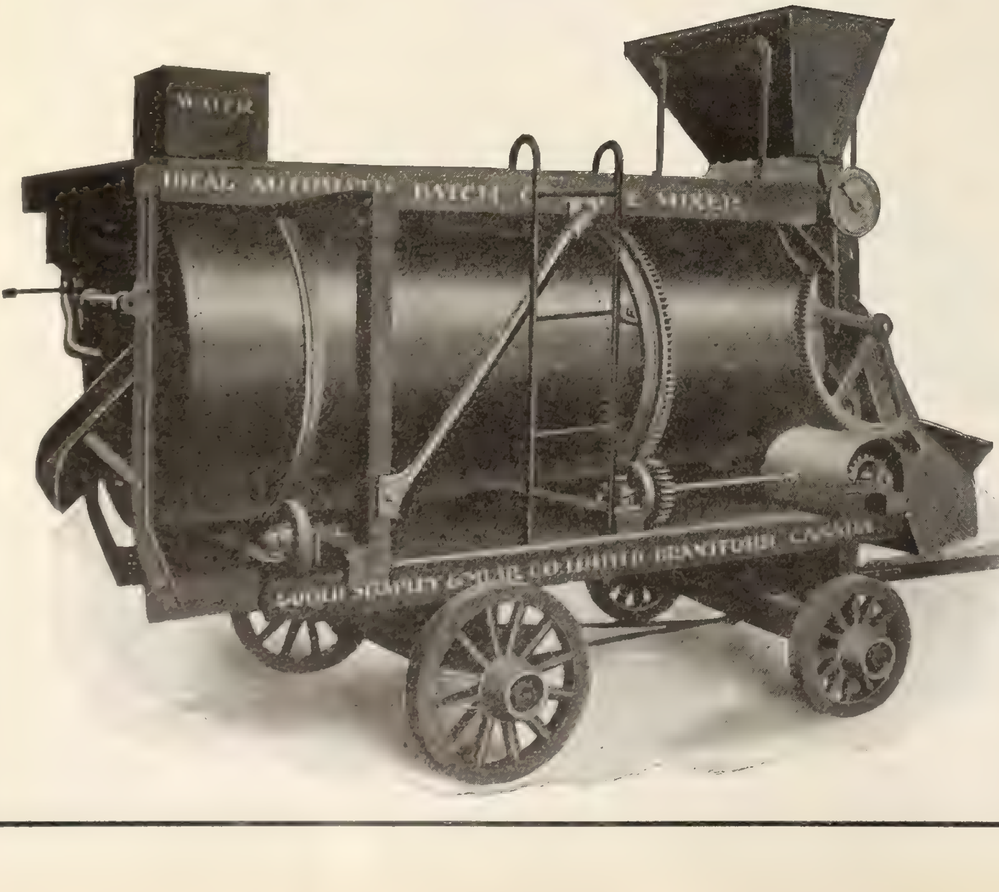
MILWAUKEE CONCRETE MIXER & MACHINERY CO. - Milwaukee, Wis., U. S. A.

CANADIAN REPRESENTATIVES.

The Stuart Machinery Co., Winnipeg, Man. C. W. Stancliffe & Co., Vancouver, B. C.
H. P. Andresen, 16 Liverpool, London & Globe Building, Montreal

---

CONCRETE MIXERS


WATER
IDEAL AUTOMATIC BATCH CONCRETE MIXER
GOOLD SHAPLEY & MUIR CO. LIMITED BRANTFORD CANADA

Our 1911 machine has all steel frame, Heavy Steel Gears; is the most up-to-date mixer made. It is a money maker.

We make

Tanks and Towers

for all purposes and any sizes. Gas and Gasoline Engines, etc.

Write for Catalogues

The
GOOLD SHAPLEY & MUIR CO. LTD.
Brantford, Canada

Meriwether System

Continuous Re-inforced

Concrete Pipe

Patented

Manufacturing 24 in., 27 in., 30 in., 33 in., 36 in., 42 in. and 48 in. pipe at Hamilton, Ontario.

Lock Joint Pipe Co.

165 Broadway - NEW YORK CITY

Write for Illustrated Catalog

QUEBEC AND ONTARIO
Francis Hankin & Co.
231 Coristine Bldg., Montreal
199 Yonge St., Toronto

MANITOBA, SASKATCHEWAN AND ALBERTA
F. H. McGavin Company Limited
103 Osborne St., Winnipeg

BRITISH COLUMBIA
Pacific Lock Joint Pipe Co.
1005 A St. Tacoma, Wash.
Globe Bldg., Seattle.

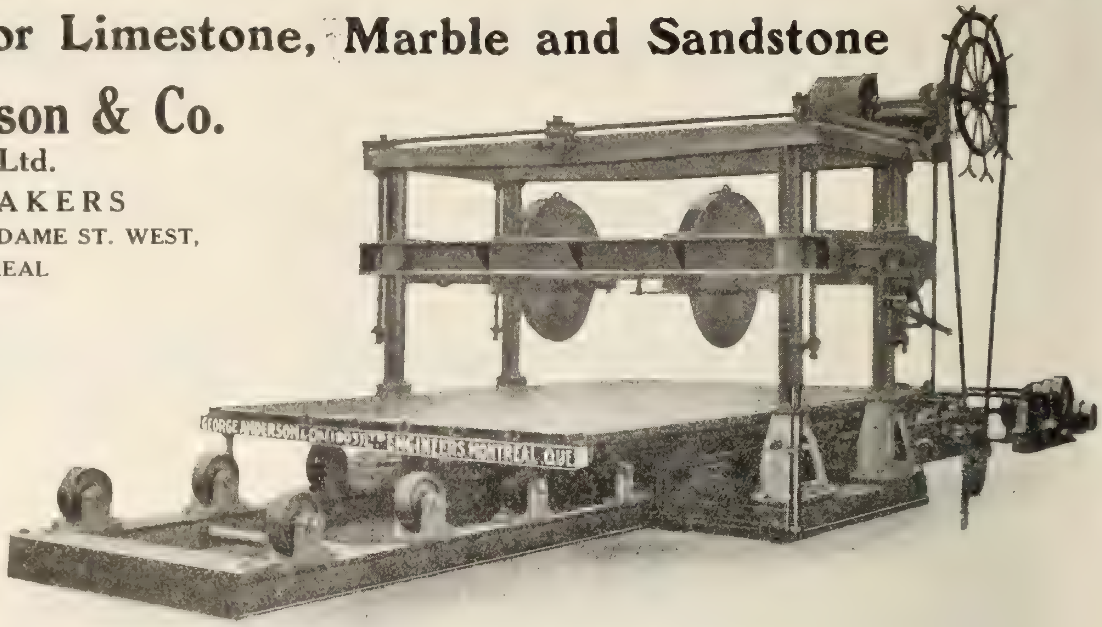
Circular Diamond Saws

For Limestone, Marble and Sandstone

Geo. Anderson & Co.
1905 Ltd.
SOLE MAKERS
Office: 86 NOTRE DAME ST. WEST,
MONTREAL

BRANCH OFFICE & WORKS
London, England, 82 Victoria St. S. W., Newark N.J. U.S.A. 420-422 Ogden St., Montreal Works, 157 Craig St. West, Head Works, Carnoustie, Scotland

MAKERS OF
CANGS PLANERS, MARBLE DRESSERS DERRICKS, AND ELECTRIC TRAVELING CRANES UP TO 50 TONS, QUARRY MACHINERY, GAS ENGINES AND PRODUCER PLANTS 10 H.P. TO 150 H.P.



Anderson's Rising and Falling Diamond Saw, made under British and U.S.A. Patents 209179, 657262 **SINGLE AND DOUBLE TABLES**

About 50 of the above Machines at work in Canada

Toronto Pressed Brick and Terra Cotta Works

BRICKS

ROOFING AND FLOORING TILE, CRESTINGS, FINIALS AND CHIMNEY TOPS

Send for Samples and Prices. Special and prompt attention given to Architects' Terra Cotta Drawings

WRITE

TORONTO PRESSED BRICK WORKS

Head Office - - MILTON, ONT.

C. J. LEWIS, Proprietor

Montreal Agent: E. F. DARTNELL, 157 St. James St. **Toronto Agent: J. D. MacDONELL, 19 Yonge St. Arcade**

USE

"TOCKOLITH"

(**TOCH BROTHERS**)

IT PERMANENTLY PROTECTS IRON AND STEEL AGAINST ALL RUST AND CORROSION

IT COMBINES WITH INITIAL RUST AND PREVENTS FURTHER ACTION

SEND FOR CIRCULARS AND INFORMATION

INVALUABLE FOR

STRUCTURAL IRON
STEEL GIRDERS
STEEL SMOKE STACKS
STEEL BRIDGES

CANADIAN OFFICE AND FACTORY

THE R. I. W. DAMP RESISTING PAINT CO.

1372-1376 BATHURST STREET - TORONTO

CANADIAN DISTRIBUTERS:

CHILLAS-BLACK, LIMITED
TORONTO

E. F. DARTNELL
MONTREAL

WM. N. O'NEIL & CO.
VANCOUVER

The Steel Company of Canada Limited
Hamilton - Toronto - Montreal

PLAIN ROUNDS, & SQUARES, COLD TWISTED SQUARES

MAXWELL DEFORMED BAR

STEEL BARS for Reinforcing Concrete

J. H. New,
President

Ryland H. New,
Vice-President.

The BEST Known

BECAUSE

BECAUSE

Established 1860

It DESERVES to BE

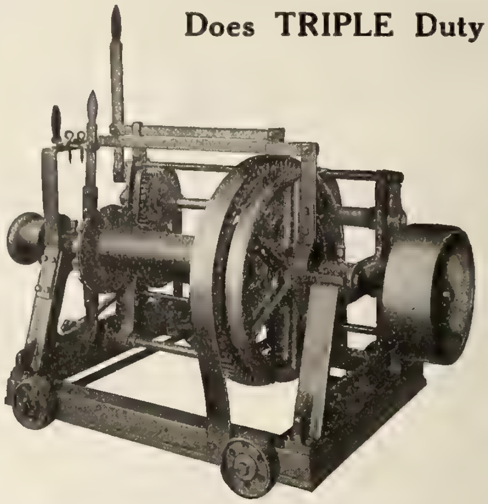
The Hamilton & Toronto Sewer Pipe Co., Limited

HAMILTON and TORONTO

Long Distance Phones: Toronto, Adelaide 936, College, 1558
Hamilton, 3990, 3991, 3432

The Parker Reversible Friction Hoist

Does TRIPLE Duty



Run with Gasoline Engine or Motor

No Experienced Operator Required

Drum. Elevator Sheave, Winch-head all operate independently of each other, and are each reversible. This hoist operates a derrick from the drum, a double cage material elevator from the sheave, and serves various other purposes from the winch-head—all on one job.

PAYS FOR ITSELF ON ONE ORDINARY JOB.

"I have used your No. 100 Reversible Hoist for over 5 years. It runs like a clock and has cost me nothing for repairs."

From an Experienced Contractor.

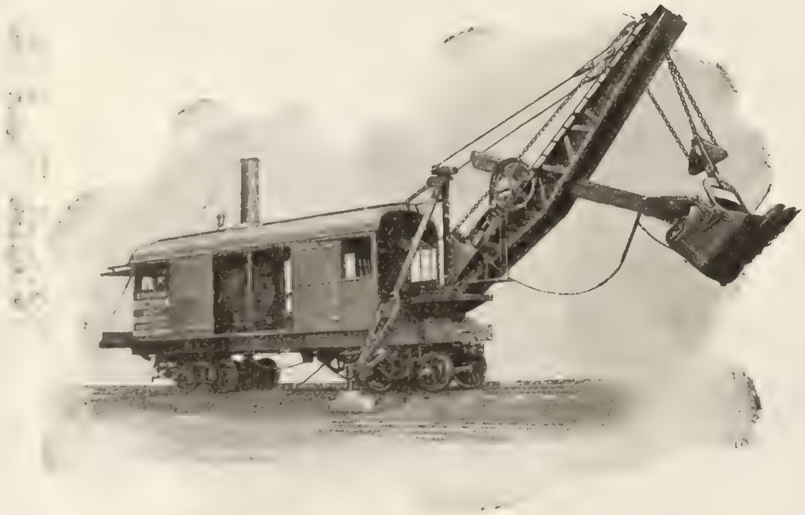
We also build derricks, steam and electric hoists in all sizes. Sole manufacturers of the PARKER PATENTED DERRICKS.

Write for information and prices.

S. E. PARKER, 1800-2 N. Francisco Ave., Chicago, Ill.

Selling Agents:
Gorman. Clancey & Grindley, Calgary and Edmonton, Alta.
The Stuart Machinery Co., Winnipeg, Man.
A. G. Langley & Co., Vancouver, B.C.
F. H. Hopkins & Co., Montreal, Que.

Canadian Bucyrus Steam Shovels



Immediate Delivery

One 45 ton Canadian Bucyrus Steam Shovel, the only one remaining of our last stock order, ready for shipment. More shovels now being built, can make short deliveries on any size.

Write for bulletin and prices.

Canada Foundry Co., Limited

Head Office: Toronto, Ontario

District Offices:
Montreal Halifax Ottawa Cobalt Winnipeg Calgary Vancouver Rossland

The

Standard Drain Pipe Co.

Limited

TWO FACTORIES:

St. Johns, P. Q. and New Glasgow, N. S.

MANUFACTURERS OF

Sewer Pipes, Culvert Pipes, Chimney Linings, Hollow Building Blocks, Fire Clay, Stove and Range Bricks and all kinds of Fire Clay and Vitrified Goods.

Catalogue and prices on application

SWANSEA

Salt Glazed and Vitrified

SEWER PIPES

True to Size.
Impervious to Water.

Sizes manufactured and always in stock 4 in. to 24 in.

Ask for Price List and Discounts.

also

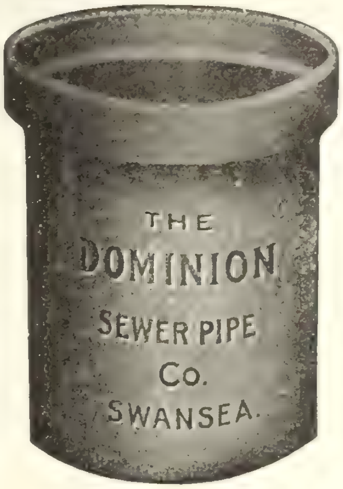
Chimney Tops
Flue Linings
Wall Coping
Culvert Pipe
Inverts

TELEPHONE (Toronto Connection)
PARK 1809

The Dominion Sewer Pipe Co.

(The Independent Co.) Limited

SWANSEA (near Toronto)



Mimico Pipe - Is Right

It is Vitrified and Salt-Glazed

AND WILL MAKE YOUR

Sewer or Culvert

A Credit to You

AS SMALL AS 4 AND AS BIG AS 24
SINGLE AND DOUBLE STRENGTH

ORDERS PROMPTLY FILLED

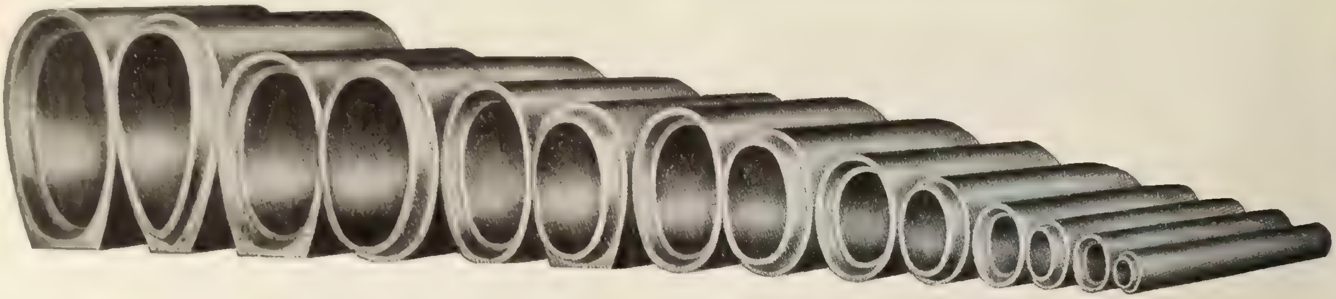
Try Us

Round Pipe and Square Dealings

The ONTARIO SEWER PIPE COMPANY, Limited

MIMICO, ONTARIO

Telephones, Toronto Connection, Park 422; Evenings, Park 3888 and 3889



We Guarantee Our

Reinforced Concrete Pipe

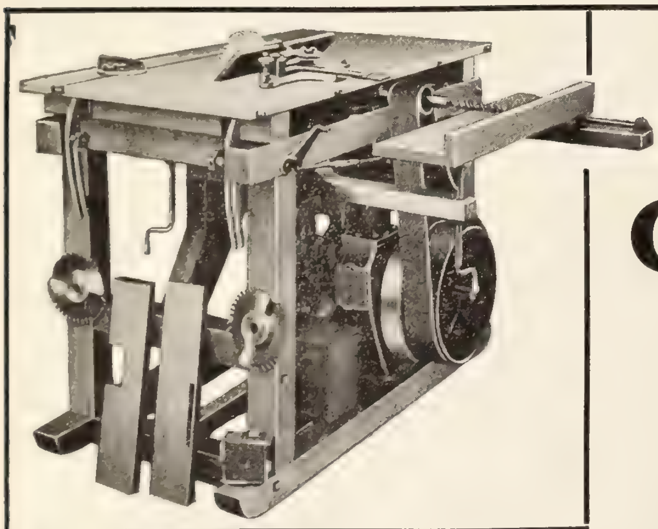
for Culverts and Sewers

"Long Service at Low Cost"

Our **Pipe** is **frost-proof, indestructible** and **everlasting.** It is easily handled, easily placed, and easily procured. It has been approved by **most particular, most renowned, most experienced,** and **most skilled engineers.**

Stock sizes 6 inch to 48 inch. Other sizes to order. **Write for catalogue and prices.**

Dominion Concrete Company, Limited
KEMPTVILLE - ONTARIO



On Every Concrete Job

You can save 10 to 15 per cent by using our Contractor's Portable Saw and Variety Woodworker.

Now is the time when you are starting to do your concrete work and this saw will be just what you are looking for—a cheap practical saw that will prove itself a time saver and money maker for you.

CONTRACTORS SUPPLIES OF ALL KINDS

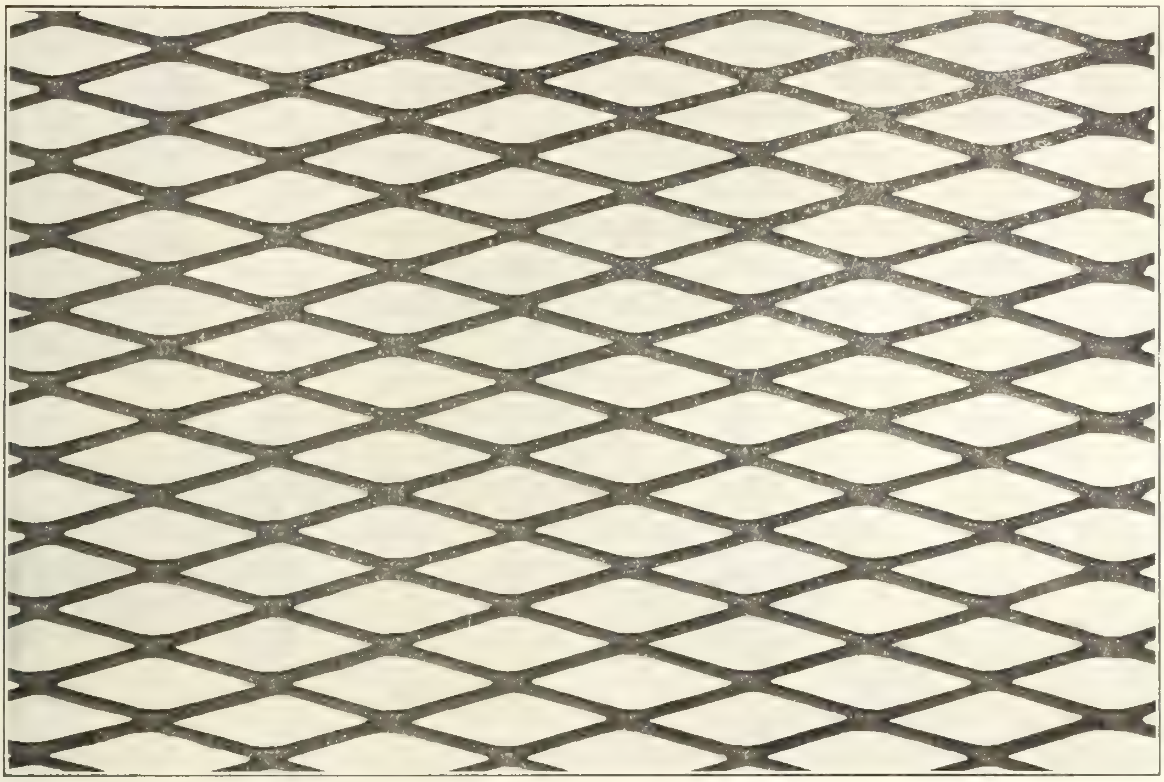
The Canadian Fairbanks Co., Limited

Fairbanks-Morse Gas Engines, Fairbanks Scales. Safes and Vaults.

Montreal Winnipeg Toronto Vancouver
St. John, N.B. Calgary Saskatoon Ottawa

WHAT IT IS

- A Rip Saw
- A Matcher
- A Mitre Saw
- A Cut-Off Saw
- A Dado Machine
- A Jointer
- A Boring Machine
- A Gaining Machine
- A Grooving Machine
- A Babbitting Machine
- A Moulder with Self-Contained Power



"Steelcrete" Diamond Mesh — the Lath with a Reputation

Since Expanded Metal was first made in Canada "Steelcrete" has been the acknowledged standard from Coast to Coast.

To-day, there are more yards of it in actual use, probably, than all other Canadian Laths combined —a few "Steelcrete" jobs being the King Edward Hotel, Toronto, the Royal Mint, Ottawa, Ontario Parliament Buildings, Toronto, Winnipeg Post Office, new East and West Blocks Dominion Parliament Buildings, Ottawa.

"Steelcrete" Expanded Metal Lath

—weighs 3½ lbs. per square yard—half as much again as is claimed for laths of same gauge.

—acquiring rigidity by shape and weight of strand has no raised ribs or beads to bury—hence makes plastering easier, quicker and cheaper.

—being made in sheets 30" wide wastes only half as much in laps and costs only half as much to apply as other laths.

—is made by same process and with same care and precision as heavy expanded metal therefore is perfectly flat and straight.

Samples, Prices and Lath Catalogue on Request.

STEEL AND RADIATION LIMITED

TORONTO
HEAD OFFICE FRASER AVENUE

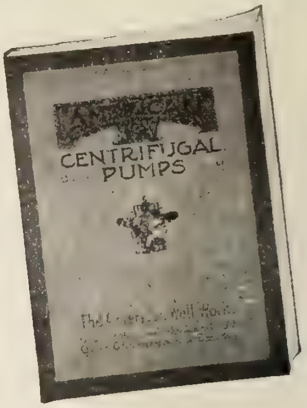
MONTREAL
138 CRAIG STREET WEST

St. John —13 Germain St.
Quebec 153 St. Paul St.
Ottawa 83 Banks St.
Regina Black Block

Fort William—113 N. May St.
Winnipeg 334 Garry St.
Calgary 309-8th Avenue.
Vancouver 116 Pacific Bldg.

Why "American" Centrifugals

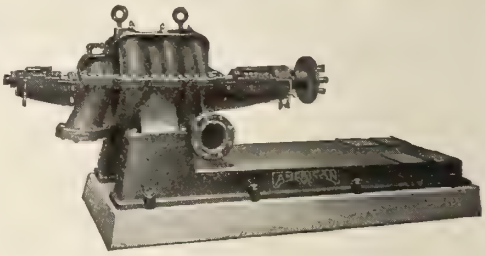
Are Most Economical in the Widest Range of Pumping Conditions.



The reason why "American" Centrifugals are unequalled for economy is that they represent the highest development of the most modern type of pump and there are the best of reasons for this higher development.

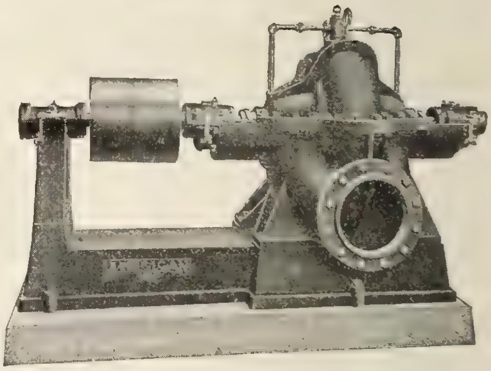
Instead of building a single type of centrifugal and recommending it for every purpose "American" centrifugals are built in over fifty distinct types and every size of every type is carefully tested in our own complete hydraulical laboratory and its efficiency proved before it is permitted to leave our works.

It must meet our standard of efficiency before it is allowed to leave our works and that is what is making the American trademark famous in pumping machinery.



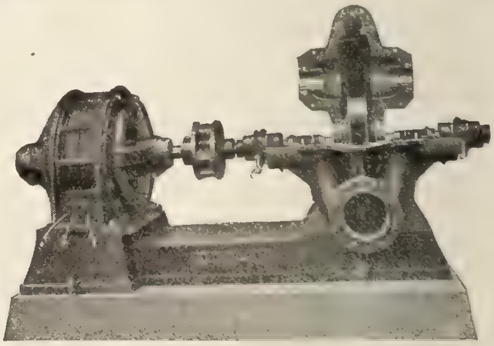
AMERICAN

"American" centrifugals attain up to 80 per cent. mechancal efficiencies and many of our specially designed pumps, installed according to our own specifications, show much higher efficiencies, enabling them to operate against high heads. We have many single stage centrifugals installed operating on over 200 feet heads.



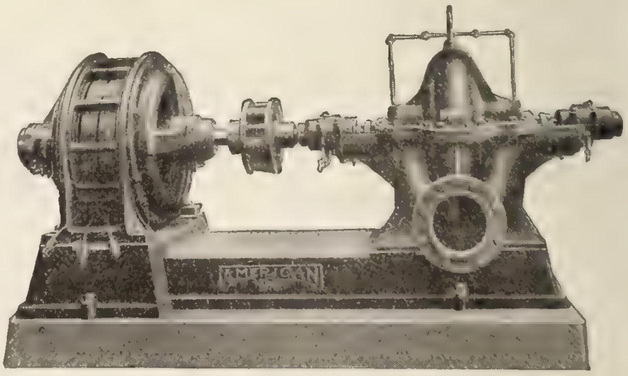
The low first cost of "American" centrifugals as compared with old style plunger pumps, combined with their high efficiencies, low cost for attendance and small cost for repairs make them **far more economical** than any other type of pump in nearly all conditions where **all costs are considered.**

Greatest economy in the end is the claim we make for "American" centrifugals and we are ready to prove that claim.



If you are interested in irrigation, write for our booklet, "Irrigation by Pumping" Bulletin No. 118.

Our General Centrifugal Pump Catalog No. 117 is the most complete ever issued. Write for it today.



The American Well Works

General Office and Works: Aurora, Ill., U. S. A.
Chicago Office: First National Bank Building

Canadian Sales Agency:
234 Craig Street West, Montreal
441 Seymour Street Vancouver, B.C.

TENTS
for Engineers and Contractors

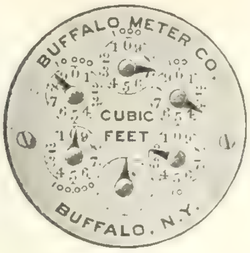
We are manufacturers of a very complete line of tents for engineers' and contractors' use and can make shipment the same day as order is received.

We also make engineers' and surveyors' clothing, in fact we can fit you completely for camp and survey trips.

Send for our catalogue
It will interest you

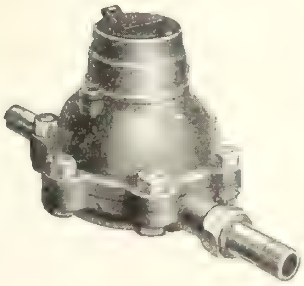
Woods Limited
Woods Building - Ottawa, Ont.

AMERICAN AND NEW NIAGARA
WATER METERS



Standard Dial

Straight Reading Dial



Jewel Bearing
Intermediate Gears
Self Cleaning and Sanitary
Adjustment for Pressure
Extra Thick, Strong Disc
Accuracy Guaranteed
Fewest Parts

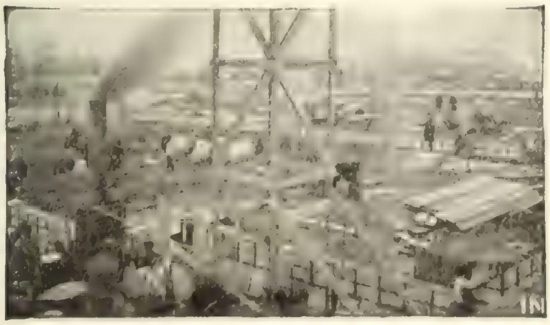
BUFFALO METER CO.
290 TERRACE, BUFFALO, N.Y.

The United States Steel Corporation, at Gary, Ind.;
Stone & Webster Engineering Corporation, Minneapolis, Minn.;
A. Monsted Co., Milwaukee, Wis.;
Geo. B. Swift Co., 903 Security Bldg., Chicago.;
Pacific Coast Condensed Milk Co.. Seattle, Wash.;
Sheffield Farms-Slawson Decker Co. Amenia, N.Y.; and
Inland Steel Co., Indiana, Ind.,
are among the largest users of concrete in the United States. They and many others, are using

REICHERT METAL FORMS

And saving from 3 to 7 cents per square foot.

Why do YOU stick to the old methods and let this additional profit slip away from you?



Building a big factory building with Reichert Metal Forms. Pacific Coast Condensed Milk Company's plant at Berlin, Wis. Stone & Webster Engineering Corporation, builders.

REICHERT MFG. CO.
MILWAUKEE, WISC., U.S.A.

Neptune Meter Co.

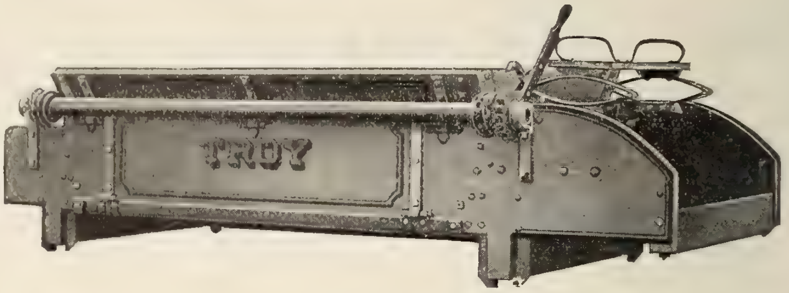
Manufacturers of the well-known

TRIDENT
Frost-Proof
Water
Meters

Write for Catalogue

Main Office - 90 West Street
New York City

Five Hundred Troy Dump Boxes Wont Last Long at These Figures



We want to demonstrate quickly to the largest possible scope of territory the great saving that can be made by the use of TROY Bottom Dump Boxes in connection with regular teaming gears on all dirt moving jobs.

We want to reach the team-owners and contractors who don't know TROY Dump Boxes. Many of them have never seen a TROY and won't believe the saving until they do see.

One TROY Box in a community means an order-getting booster for us. Every sale means more sales and lots of them. That is why we have set aside 500 TROY Boxes for special advertising purposes.

But we must Limit Purchases under this Special Proposition to One Box per Customer

Our regular price for the 1½ yd. Box is $45.00 each and for the 2 yd. Box, $50.00.

We will furnish 500 Boxes at the following special advertising price—good only as long as the 500 Boxes last and no order accepted at these figures after September 1st, 1911.

Special Advertising Price, 1 1-2 Cu. Yd. Box............ $36.90 each.
" " " 2 Cu. Yd. Box................ $40.20 each.

Terms net cash with order, F. O. B. Troy, Ohio. Boxes furnished to fit any size gear.

First come, first served. They are going fast. If you want a TROY Box at these figures, MAIL YOUR ORDER TO-DAY.

THE TROY WAGON WORKS COMPANY

North Market St. TROY, OHIO

FILE YOUR PLANS

Free of charge at any of the four offices of the

"CONTRACT RECORD"

Contractors and manufacturers of building, municipal, railway, and power plant equipment not only expect to see your tenders advertised in the "Tenders' Department" of the "Contract Record," but they will also find it a great convenience if you place your plans and specifications on file at any or all of our four offices, viz. Toronto, Montreal, Winnipeg and Vancouver.

Send along your next Tender Advt. together with Plans and Specifications

CONTRACT RECORD

220 King St. West, TORONTO

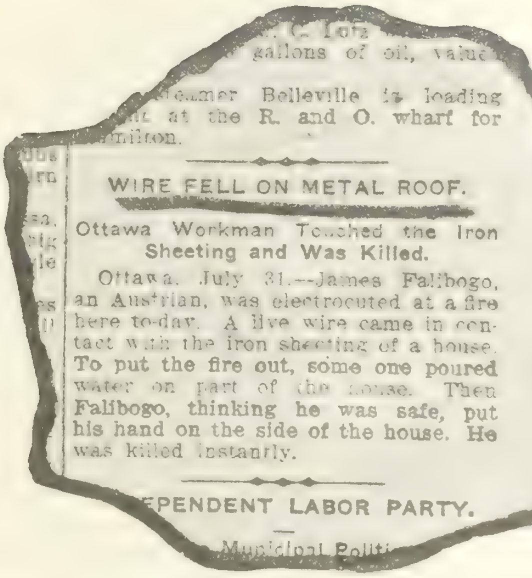
MONTREAL
Board of Trade Building

WINNIPEG
Travellers Building

VANCOUVER
Crowe & Wilson Chambers

"Asbestos Shingles"

Would have saved this life and prevented this fire



gallons of oil, valu

eamer Belleville is loading

at the R. and O. wharf for

milton.

WIRE FELL ON METAL ROOF.

Ottawa Workman Touched the Iron Sheeting and Was Killed.

Ottawa, July 31.—James Falibogo, an Austrian, was electrocuted at a fire here to-day. A live wire came in contact with the iron sheeting of a house. To put the fire out, some one poured water on part of the house. Then Falibogo, thinking he was safe, put his hand on the side of the house. He was killed instantly.

EPENDENT LABOR PARTY.

Municipal Politi

From the Evening Telegram

As demonstrated by the above accident, metal shingles are not always fireproof, ***but are fine conductors.*** In this age when electricity is being so extensively used, and generally transmitted overhead, every architect and engineer should see that his roofing material is "Fireproof in every respect," and a Non-Conductor of Electricity.

Asbestos cement slates like cement itself improve and hardens with age, can never burn nor transmit electricity.

ALWAYS SPECIFY

"Asbestos Shingles"

Asbestos Manufacturing Co., Limited

705 Eastern Townships Bank Building, MONTREAL, P.Q.
Factory at Lachine, P.Q.

"LITTLE GIANT"

ROCK DRILLS

SIMPLICITY is an important characteristic of a Rock Drill, but it must be judicious simplicity. To carry simplicity to a point of impairing efficiency is mistaken economy.

RAND "Little Giant" Rock Drills are as simple as is consistent with the highest attainable efficiency. Every part is simplified to the limit of efficiency, and the number of working parts is reduced to the practical limit, but nothing is sacrificed for the reduction of price.

The "Little Giant" is the "Standard" of Canada, and represents the highest sustained value to purchasers.

CANADIAN RAND CO., LIMITED

Commercial Union Building, MONTREAL, CAN.

Toronto, Cobalt, Winnipeg, Lethbridge, Rossland, Vancouver, Halifax
South Porcupine Spokane Sydney

The
Ontario Lime Association Limited

BUILDERS' SUPPLIES

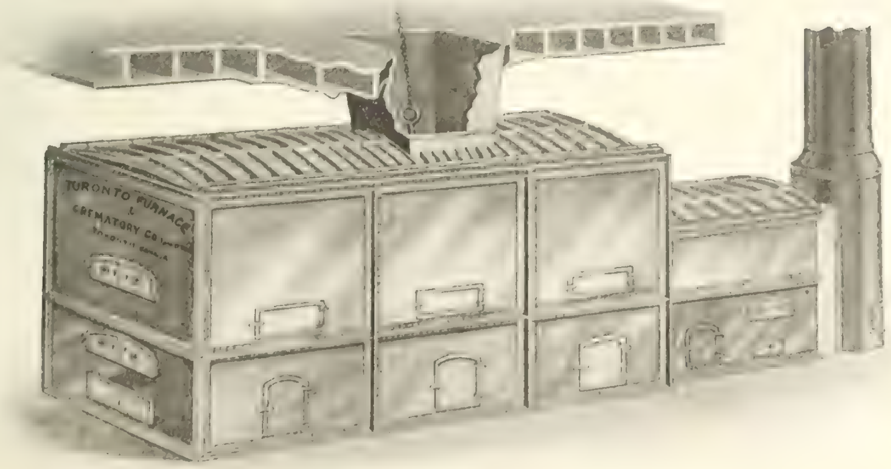
Head Office: 510 Crown Life Building, Queen and Victoria Sts. Phone Main 5472-5473
Evenings, Parkdale 2583

Branch Offices and Yards:

ESPLANADE YARD, Phone Main 643, 118 Esplanade Street East
PAPE AVENUE YARD, Phone North 4484, Gerrard St. and Pape Ave.
EAST TORONTO YARD, Phone Beach 621, Gerrard Street East
NORTH TORONTO YARD, Phone North 416, Yonge St. and C.P.R. Tracks
DAVISVILLE YARD, Phone North 5143, Yonge and Merton Streets
DUPONT AND MANNING AVE. YARD, Phone College 6678, 434 Dupont Street
WEST TORONTO YARD, Phone Junction 479, 12 Weston Road
PARKDALE YARD, Phone Park 115, Queen Street Subway

With the above yards and offices distributed throughout the city and suburbs we are in a position to give you immediate deliveries of any orders placed with us. You need good service. We need your business. Our prices are always right. No order too large, no order too small. Save time and money by dealing with us.

STEEL CLAD INCINERATORS


TORONTO FURNACE & CREMATORY CO. LIMITED

The Steel Clad Incinerator is the highest development in sanitary garbage and refuse destructors.

MAXIMUM CREMATING CAPACITY, MINIMUM FUEL AND LABOR.

BUILT IN SIZES FROM 4 TONS TO 100 TONS DAILY CAPACITY.

ADAPTED FOR TOWNS AND CITIES FROM 3,000 TO 500,000 INHABITANTS.

Cremating Destructor Closets for Hospitals, Abattoirs, Factories, etc., etc.
Special types of burners designed for any class of work and all sizes and capacities to suit the requirements.

Write us for plans and information.

The Toronto Furnace & Crematory Company, Limited
70 and 72 King Street East - - Toronto, Ontario

Store of Henry Birks & Sons, Limited, Montreal, Huchinson, Wood & Miller, Architects.

What a Fire Did—and Didn't!

Some years ago Henry Birks & Sons, Limited, of Montreal, built a big addition to their magnificent jewelry establishment.

Downstairs they were pretty particular about the materials used; the fact that Pedlar Metal Lath was used in the ceiling of the ground floor shows just how particular they were.

But upstairs they weren't quite so particular; in fact, they "economized" a little and used ordinary wood lath for the ceilings and partitions.

Shortly before Christmas—just when everything was ready for the biggest business season of the year—the inevitable fire occurred. It broke out somewhere upstairs and gutted everything above the first floor.

The Montreal fire department poured in tons of water, every gallon of which, seeking its own level, ran down to the ceiling of the first floor.

In addition to the ordinary capacity of some 50 lbs. to the square foot, every square foot of that ceiling must have carried some 300 or 400 lbs. additional weight in water.

Then the firemen chopped some holes and allowed the overflow to drain away.

After the fire and in spite of the complete devastation of the upper floors of the building, the ground floor was left in such excellent condition that Henry Birks & Sons, Limited, were able to go right ahead and do without a hitch the big Christmas business they had anticipated.

Some three weeks later the architects were called in and a careful examination was made of that first floor ceiling that had been put up on Pedlar Metal Lath.

Except for the few holes that had been cut to let the water out, the ceiling was pronounced perfectly sound. The holes were patched.

That fire occured some years ago, and to-day Henry Birks & Sons, Limited, are still doing business under the same ceiling that was put up on Pedlar Metal Lath, and was subject to so severe a test by fire and water.

The PEDLAR PEOPLE LIMITED

OSHAWA
Established 1861

HALIFAX . . . 16 Prince St.
LONDON . . . 86 King St.
WINNIPEG . . . 76 Lombard St.
MONTREAL . . . 321-3 Craig St. W.
PORT ARTHUR . 45 Cumberland St.

OTTAWA . . . . 423 Sussex St.
TORONTO . . . . 111-113 Bay St.
CHATHAM . . . . 200 King St. W.
QUEBEC . . . . 127 Rue du Pont
REGINA . . . . 1901 Railway St. S.

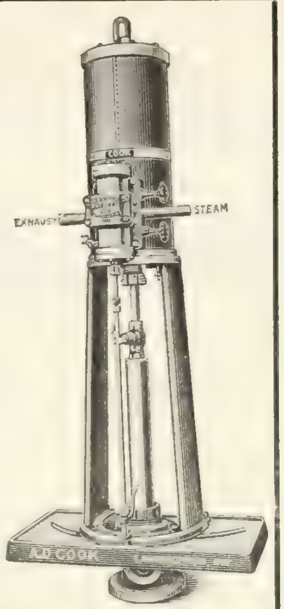
CALGARY . . . Room 7, Crown Block.
VICTORIA . . . 434 Kingston St.
ST. JOHN, N.B. . 42-46 Prince William St.
VANCOUVER . . 319 Pender St.
EDMONTON . . 633 Fifth ave., north of Jasper.

Address Our Nearest Warehouse. We Want Agents in Some Sections. Write for Details. Mention this Paper.

Water Supply from Deep Wells

is obtained at a minimum cost by use of our deep well pumps.

Write for Bulletin 26 explaining the use of Cook's Patent Brass Tube Well Strainer.



A. D. COOK

Lawrenceburg, Indiana, U. S. A.

Manufacturer of a Complete line of **DEEP WELL SUPPLIES** including Steam, Belt and Motor Driven **DEEP WELL PUMPS**, Wind-mill and Hand Pumps, Working Barrels and Valves, Pump Rods and Pump Rod Joints, Drill Rods and Drill Rod Joints, Drilling and Well Tools.

CATALOGUE MAILED UPON REQUEST.

The
Rogers Supply Co.
28 King St. West - - - Toronto

Stone
Cement
Sand

Prompt Delivery Service ::: Main 4155

Modern Gas Lighting Fixtures

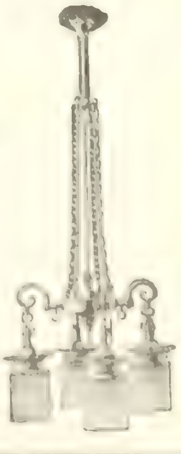
On Exhibit at the

Toronto Exhibition

The fixtures illustrated here will give you an idea of the changes that have taken place in the last few years, in Gas Fixture Designing. Ask for our booklet on *Modern Home Lighting.*

Modern Gas Lighting means the use of the efficient and beautiful gas lamps obtainable at the present time, in distinction from the common, and ordinary fixtures of years ago.

Exhibition visitors are respectfully invited to inspect our new salesrooms at 12 and 14 Adelaide St. West, Toronto, where the finest display of Modern Gas Fixtures in Canada can be seen to advantage.



A Grand Opportunity for the Home Owner, Architect and Builder, to see all that's new in Modern Gas Lighting.

The Consumers Gas Company of Toronto

FIXTURE EXHIBIT, Process Building.
INDUSTRIAL FUEL APPLIANCES,
Machinery Hall Building.

CITY SALES ROOMS
12-14 Adelaide Street West, Toronto
Phone Main 1933

O. W. Norcross, President Wm. J. Denholm, Vice-President Henry J. Gross, Secretary Albert J. Park, Treasurer.

NORCROSS BROTHERS
J. A. and O. W. Norcross—1865-1897

NORCROSS BROTHERS
O. W. Norcross—1897-1902

THE NORCROSS BROS. CO.
Massachusetts Corporation—1902

The Norcross Brothers Co.

General Contractors

Head Office, Worcester, Mass.

Iberville, Que.

WINNIPEG BRANCH OF THE BANK OF MONTREAL
McKim, Mead & White, Architects Winnipeg, Manitoba The Norcross Brothers Co., Builders

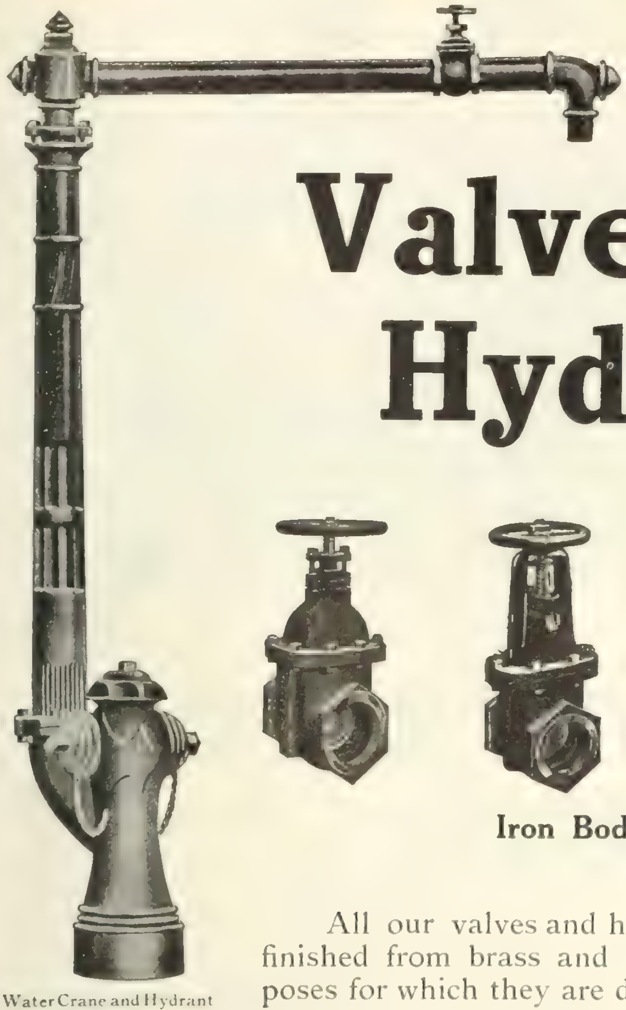
Exterior finish White Bethel Granite

We are prepared to execute cut stone and general contracting in granite, marble and soft stones for exterior and interior work.

A call of any interested party will bring our representative showing photographs of work in material most suitable to the location.

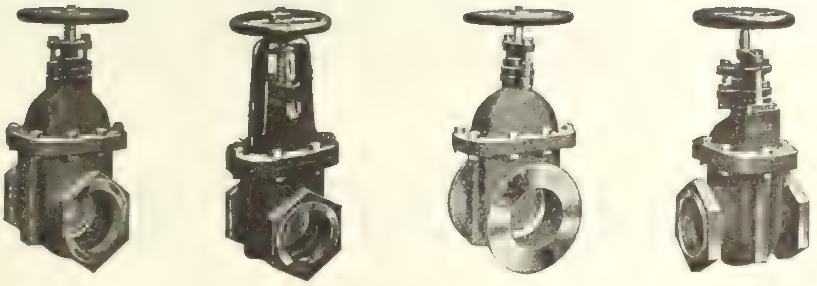
The Norcross Brothers Co., of Canada

Iberville - Quebec

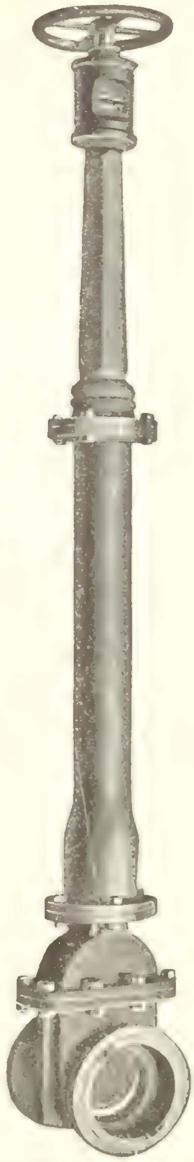


Water Crane and Hydrant Combination

KERR Valves and Hydrants



Iron Body Gate Valves



Indicator Post for Fire Protection Valve

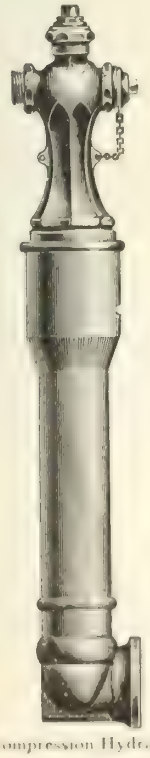
All our valves and hydrants are carefully made and finished from brass and iron and are suited to the purposes for which they are designed.

We make valves for power plants, heating systems of factories, office buildings and dwellings and waterworks systems, in fact for almost any service. We also manufacture several styles of valve boxes for waterworks valves and a large amount of the material used in connection with sprinkler systems.

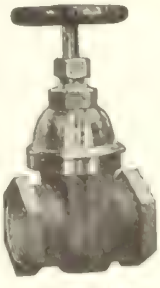
When you think of **VALVES** think of **KERR** and the goods they manufacture. Those familiar with steam and water goods associate **KERR** with high-class valves and hydrants.

Valves are a specialty with us and every minute of our time is given to the subject.

There may be lower priced valves on the market, but it is not price alone that you are considering, you want valves that will give long and satisfactory service.



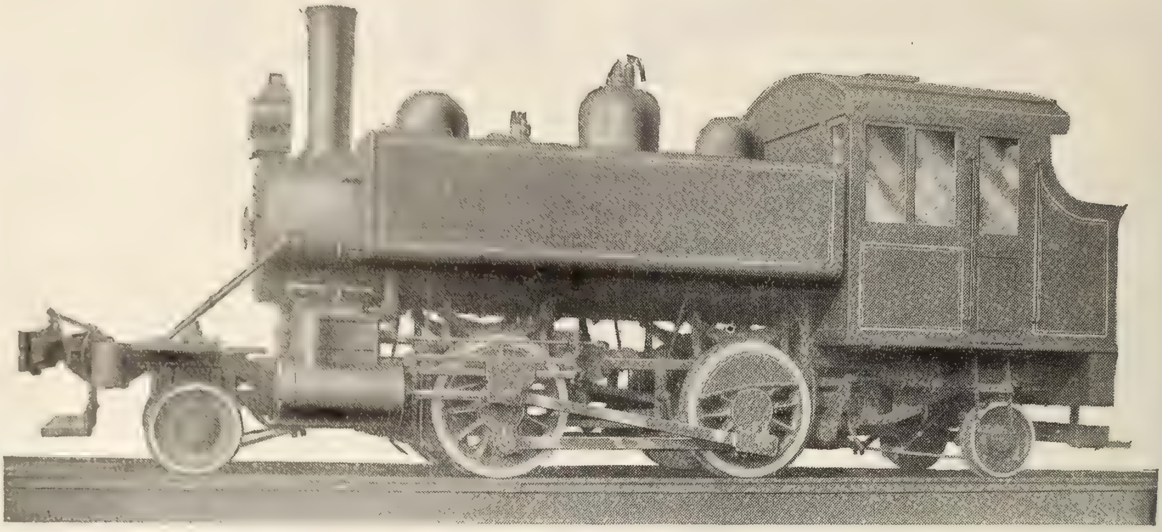
Compression Hydrant



"W[illegible]" Gate

[illegible]

THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.



RIGHT DESIGN RIGHT MATERIALS BEST RESULTS

Locomotives to give the best results must be constructed of the right materials and of the right design. Our locomotives for contracting, quarrying, plantations and switching around mines and industrial plants, are designed by engineers who have made a study of conditions in the fields where locomotives are used, and they know what is needed.

Every piece of material entering into their construction must undergo a thorough test and conform to the same specifications required for the largest trunk line locomotives. Only the best materials are used, insuring long life and satisfactory results.

They are built from special designs to meet special needs, and are assembled from stock parts made to accurate gauges. With this method repair parts must fit.

These locomotives are equipped with large boilers with long flues, are easy steaming and light on fuel.

Interchangeable repair parts are kept on hand at our Works at Longue Pointe, Montreal, Canada.

MONTREAL LOCOMOTIVE WORKS, LIMITED

OTTAWA BANK BUILDING, MONTREAL, CANADA

London Automatic Batch Mixer No. 1
Capacity 50 yards per 10 hours.

London Concrete Mixers

are made in all sizes, meeting every requirement. CONTRACTOR, WE DO NOT DICTATE TO YOU AS TO WHAT STYLE OF MACHINE YOU SHOULD PURCHASE, we have EVERY STYLE AND SIZE of mixer required.

London Automatic Batch Mixer No. 2. Capacity 25 yards per 10 hours

These machines will be shipped anywhere on approval. WHY PAY A LARGE PRICE FOR CONCRETE MIXER WHEN YOU CAN PURCHASE AN AUTOMATIC MACHINE AT A MODERATE PRICE?

The London Automatic Machines will save you money—
- Cost of Producing Concrete.
- In the First Cost of Mixer.
- Cost of Maintenance.

We also Manufacture—

CARTS FOR CONVEYING CONCRETE BLOCKS AND TILE
WHEELBARROWS; CONCRETE CARTS
FACE-DOWN BLOCK MACHINES; FRICTION HOISTS
CEMENT BRICK MACHINES; POWER HOISTS
POWER CEMENT DRAIN TILE MACHINES
HAND CEMENT DRAIN TILE MACHINES

ADJUSTABLE SILL, STEP AND WINDOW CAP MOULDS;
SEWER PIPE MOULDS; FENCE POST MOULDS;
ORNAMENTAL MOULDS; SILO CURBS
CONCRETE CHIMNEY CURBS;
ROCK CRUSHERS;
And a full line of CEMENT WORKING TOOLS

We are the largest manufacturers of Concrete Machinery in Canada, and can meet every requirement of the Contractor in the line of Concrete Machinery at the lowest possible cost. Tell us your requirements.

London Concrete Machinery Co., Ltd., 19 Marmora St., London, Canada

Branches

A. G. Brown-Jamison Co., Ltd., 1048 Westminster Ave. Vancouver, B.C.
Hamilton Machinery Co., 52½, Princess Street, Winnipeg, Man.
Hamilton Machinery Co., 609 8th Ave. W., Calgary, Alta.
G. B. Oland & Co., 28 Bedford Row, Halifax, N.S.
London U. K. Concrete Machinery Co., 1 & 2 Birbeck Bank Chambers, London, Eng.
Foss & Hill Machinery Co., 329 St. James St., Montreal.

(See Our Exhibit at Toronto Exhibition, South-east of Machinery Hall, or London Exhibition in Cement Machinery Hall.)

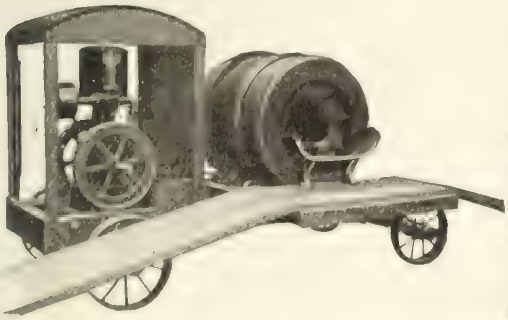
To Any One Who Will Investigate

There is a fact that compels Conviction That The Eclipse Low Charging Concrete Mixer

SAVES MONEY

Saves in the first cost of the machine, saves in power, saves in fuel, saves in manual labor, saves in attendance of the machine, saves in portability, saves in delays, and saves in repairs.

Figure all of this saving and the aggregate saving is so important that the greater economy must be evident to you.



First of all it charges only about 2 feet from the ground. There is no charging elevator required, no mechanism to operate a charging elevator, no extra man to attend it and no additional power required to operate it.

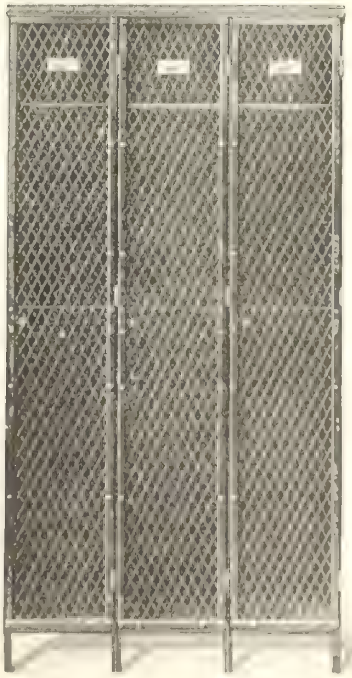
There is only the simple mixing drum direct connected to the power required to operate it, so simple, so compact and so portable that the workmen can move the mixer to any location on the job in a moment's time. And the large, open drum removes all guess work from the mixing. You can see the entire batch when mixing

Catalog No. 45 describes it. Shall we send the catalog.

The STANDARD SCALE & SUPPLY Co

New York, 136 West Broadway; Pittsburg, 243 245 Water Street; Philadelphia, 35 South Fourth Street; Chicago, 1345-1347 Wabash Ave

GET AWAY



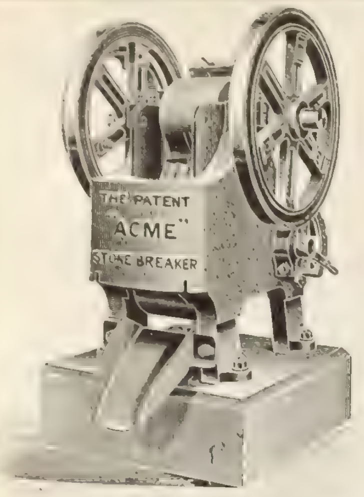
from the old style wooden lockers and use **Meadows' Metal Lockers.** Their construction is rigid and embodies a number of original features not found in other makes worthy of your consideration.

Send for our interesting booklet entitled

"Locker Lore"

GEO. B. MEADOWS

Toronto Wire, Iron and Brass Works Co., Limited
TORONTO, CANADA



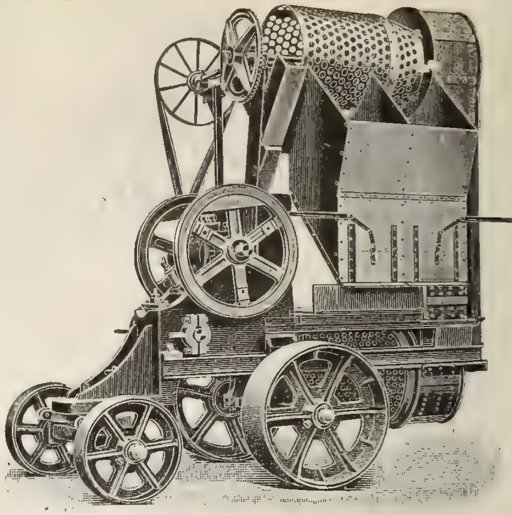
ACME

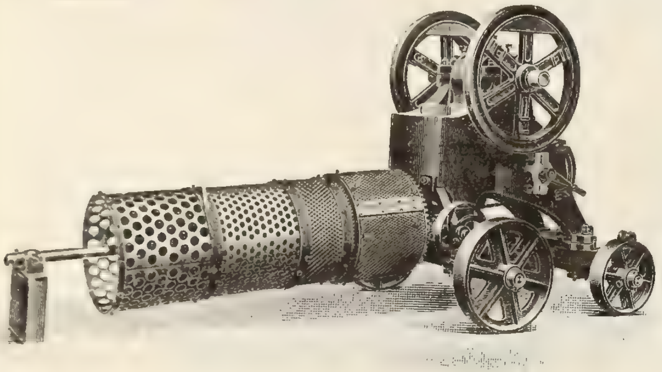
Stone Crushers

Fixed—with solid frame and reversible cubing jaws.

Portable—with or without new lifting screen and platform.

Portable—Automatic with screening elevating, loading and rejection — returning appliances.





ALSO

GYRATORY Crushers

Coke, Brick and Concrete Breakers

Concrete Mixers

The FORD Iron Company Limited

TELEPHONES: Main 7600 Main 7601

Montreal, P.Q.

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

THE STANDARD IDEAL COMPANY LIMITED

GENERAL OFFICES AND FACTORIES - PORT HOPE - CANADA

The Largest Exclusive Cast Iron Porcelain Enameling Works under the British Flag

BRANCH OFFICES AND SHOW ROOMS

TORONTO
119 KING STREET EAST

MONTREAL
44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

ESTABLISHED 1886

Contract Record

A Weekly Journal of
Building, Contracting, Engineering, Public Works
Municipal Progress, Advance Information

PUBLISHED EACH WEDNESDAY BY
HUGH C. MACLEAN, LIMITED
HUGH C. MacLEAN, Winnipeg, President.
THOMAS S. YOUNG, General Manager.

HEAD OFFICE - - 220 King Street West, TORONTO
Telephone Main 2362

MONTREAL Telephone Main 2299 B34 Board of Trade
WINNIPEG - Telephone Garry 856 - 404 Travellers' Bldg.
VANCOUVER - Tel. - 26 Crowe & Wilson Chambers
CHICAGO - - - - - - - - 4059 Perry Street
LONDON, ENG. - - - - - - 3 Regent St., S.W.

SUBSCRIPTION RATES
Canada and Great Britain, $2.00 U.S. and Foreign, $2.50

Vol. 25 August 30, 1911 No. 35

Toronto Sewage Disposal

In this issue we publish an article descriptive of the steps the city of Toronto is taking towards a satisfactory disposal of sewage. Based upon thorough investigation and expert advice, the aim has been to subject the discarded water supply to as high a degree of purification as prevailing conditions warrant. The project has been an immense one, and the method of procedure necessitated a curtailment of needless expense. To this end advantage was taken of the capability of the adjacent lake to complete the removal of putrescibility which is the final process of oxidation.

The crude sewage is first subjected to screening for the removal of suspended organic matter of a coarse nature. Of the numerous ways of dealing with the retained sludge the one chosen in the Toronto system is that of burying between alternate layers of ordinary refuse in a marsh, thus performing the additional service of filling up a low lying piece of land. The sewage, after being thus relieved, undergoes a further clarifying in the settling basins thus reaching the stage where it will rapidly undergo putrefaction by the decomposition of organic matter in solution. It is then hustled into the lake where Nature is relied upon to practise her economical methods of oxidation. This is inferior to a contact bed of natural soil of an open and friable kind for the purpose, but such land in the quantity required could not be obtained, nor is it here sufficiently porous to allow of both liquid retention and air retention necessary to oxidation and nitrification. Furthermore, since nitrification ceases during frost, the system would be thrown out of office for at least one-fourth of the year.

Evidently the whole system to the mouth of the outfall was designed with a view to securing the efficient aid of nitrifying bacteria in the lake water without resulting nuisance.

When the project was under official discussion, an extension of the system to remove putrescibility and secure a high degree of purification was advocated. The conclusion arrived at was however that an efficient dispersion at a suitable distance from shore into lake water would result in a marked economy in first cost and operating expense and would attain the result desired, thus eliminating the installation of an expensive disinfection process.

The construction entailed a number of engineering problems that are worthy of note apart from the general work, including as it did a sub-aqueous pipe siphon under the Don and tunneling and open cut work under unusual conditions.

The Toronto Water Supply

Intakes pipes of waterworks in a number of American cities have been causing considerable inconvenience and trouble during the past several years. The city of Toronto is not alone in its sufferings in this respect and has a score or more of sympathizers. The sources of trouble appear to be many and leaks occur at almost every possible opportune point. Where these pipes are run out for a long distance in order to avoid the use of water which may be contaminated, it is manifestly important that they should remain tight throughout their entire length. Few water departments drawing their supplies through such intakes maintain such a frequent inspection of the quality of the water that it will afford immediate notice of any pollution, and consequently a leak is likely to continue for an indefinite time until there is an outbreak of disease due to water-borne bacteria. The subject has received considerable attention from consulting engineers, although very little has been said about it. The detection of a leak, after the probability of one has been indicated by a change in the quality of the water, may be a very troublesome task unless provision is made for testing the pipe from time to time by some means. Some of the water-works associations would do a useful work by finding out how many cases of leakage have actually occurred, the nature of the trouble and the way in which the location of the faulty section was found in each case. Another trouble with intakes which experience shows could be carefully considered is due to the shifting of sand about the mouth, whereby a large amount of this material is drawn into the pipe so as to restrict its capacity. It is evident from the experience of a number of cities in the last two years that both these sources of trouble should be studied carefully.

The first intake pipe installed by the Waterworks Department of Toronto was in 1882. It was of wooden construction six feet in diameter and its location was just west of the present steel pipe. It extended at that period to the top of the slope which rapidly descends into the lake bed and was at that time in 30 feet of water.

In May, 1891, this intake was extended 361 feet farther out into the lake, the mouth of it being in the same location as that of the present intake pipe. This extension was also 6 feet in diameter and is built of steel pipe. In 1893 Engineer Keating gave the intake a thorough personal examination and found the steel extension to be defective, the principal cause of which was its having been laid upon stilts. This was remedied by relaying the pipe upon sand at the bottom and furnishing it with an uptake at its terminus. The repair work also included a compling of some of the joints in the wooden pipe, which had been laid open owing to the change of position which occurred to the steel pipe. Three years later the work of improvement consisted in abandoning the wooden pipe and laying 6-inch steel pipe in its stead joining to the shore terminus of the 361 feet that had been previously laid. The operation completed, no further trouble was evinced until last year when it was noted that the sand was gradually sifting down the slope and in this way lessening the effective height of the uptake at the extremity of the pipe. The most feasible, economical and simple remedy which was suggested was the lengthening of this uptake some 15 feet, which would assure its safety against any further tendency the sand would inevitably have. However, this plan was rejected and orders were given to extend the intake pipe 500 feet farther out into the lake. Equipment was obtained and operations were commenced in September, 1910, for this addition, but owing to the inclement weather of the fall and early winter the undertaking did not make much progress. The extension called for steel pipe 160 feet in length with cast steel flanges double rivetted. Wooden gaskets were inserted in the joints and the pipe lengths were united with 44 bolts. The new pipe to prevent scouring has a row of interlocking sheet steel piling driven down into a sufficient depth of sand to assure steadfastness and filled around the pipe with concrete to a depth of one foot on sides and top. In December, 1910, the mouth of the intake was stopped up by a considerable amount of anchor ice resulting in an insufficient supply of water and causing considerable trouble in its removal.

It was not until February 7th of last year, however, that the intake gave the most serious trouble. This was due to a very severe storm causing waves sufficient to wash away the sand foundation from under the intake for over 600 feet of its length and to a depth of about 5 feet, thus dropping the pipe into the lake and causing several breaks in the system, which, aided by the storm rapidly filled up with sand. The deterioriation was the cause of a whole winter's work for the Waterworks Department. An investigation showed the trouble to be in the outer portion of the pipe as no sand was present in the sections nearer shore. To the city the entrance of the sand had the effect of depriving its northern portion entirely of water and decreasing the pressure even in the business district to a very low figure, thus placing all in eminent danger from fire, and causing the closing down of a number of factories and manufacturing establishments.

To eliminate a catastrophe the waterworks engineer ordered the opening of Long Pond for water supply. The examination of the water here showed it to be, if anything, better than that supplied from the lake. This owing to the fact that during the winter months the pond had been under cover of a thick covering of ice and was not subjected to under currents from a dangerous direction.

The brief time during which the injured intake was in operation after the accident was nevertheless sufficient to introduce great quantities of sand into the pipe thus rendering it for the time being useless and necessitating the constant employment of a large force of men for its removal. This extra work occupied a considerable portion of the spring and summer, and it is only recently that operations have been recommenced on the 500 foot extension into the lake. This proposal of the city council has been a subject for considerable discussion as the benefit to be derived therefrom is not easily apparent. The analysis of water 500 feet farther from the shore than the mouth of the present intake does not show an improvement for drinking purposes that would authorize the procedure. Examination of water at a distance of four miles into the lake has shown it to be no more suitable for drinking than that nearer at hand. The alteration in the uptake at the extremity of the pipe would eliminate the difficulty caused by sand injection and would supply water from which dangerous impurities are to be removed before it reaches the city mains. However, with the completion and entrance into operation in a short time of the immense filtration plant which has been described in detail from an engineering point of view in a series of articles in the Contract Record, together with the completion of the main drainage works described in this issue, the extended intake pipe will put to a severe test the advisability of continuing to search for a suitable water supply in the bed of Lake Ontario.

Montreal's New Building Code

The Montreal city council has recently adopted an amendment to the present building by-laws which prescribes that in future all such buildings as theatres, asylums, schools with dormitories, hotels, departmental stores and large apartment houses, shall be in future constructed of fireproof materials. The present building by-law, with these amendments, reads as follows:

"Sec. 1.—Paragraph (j) of sec. 97 of by-law No. 260, as added by sec. 8 of by-law No. 337, is repealed, and the following substituted therefor:

"(j.) All theatres, orphanages, boarding schools, schools having more than one storey above the basement, schools with dormitories, hotels, asylums, houses of refuge, hospitals, departmental stores, apartment houses containing more than seven lodgings, apartment houses having more than three storeys above the basement, and all buildings over sixty feet high and having more than four storeys above the basement, hereafter erected or altered, shall be built or altered with fireproof materials, as provided in sec. 97 of said by-law No. 260."

"Sec. 2.—This by-law shall be considered as forming part of said by-law No. 260, which it amends, as to gards the penal clause and to all other intents and purposes."

As a concession to those who have already started building, a clause was added permitting the building inspector to allow the erection of special brick buildings of mill construction to a greater height than 60 feet, in any case where the contracts have been let at least thirty days before the passing of this bylaw.

The preservation of iron in concrete is again attested in the demolition of an old gasometer in Hamburg, Germany, as reported by "Fer et Acier," of Brussels. This structure was built about 1852, and when taken down 48 years later, the iron anchor bolts which had been completely encased in a cement concrete were found to be as fresh and bright as new iron, with no traces whatsoever of rust.

Reinforced Concrete and Electrolysis

Electrolytic Corrosion of Steel in Concrete—Methods of Overcoming this Source of Danger — Necessity of Good Materials

The possible danger to reinforced concrete structures from electrolysis began to be frequently mentioned five or six years ago. Since then a half-dozen laboratory studies have been made and the results published. These last experiments not only review and confirm the conclusion of previous experiments, that electric currents will cause failures in reinforced concrete, but they throw light on several matters not made clear in previous experiments. These are briefly the resistance to electric currents, or conductivity of concrete; the weakening effect, if any, on concrete, of passing electric currents through it; the possible efficiency of insulating coatings applied to the concrete or the reinforcement; the possible value of mixing or impregnating the concrete with some non-conducting material, etc. The experiments, in brief, tell us more of the possibilities of overcoming the danger of electrolysis than of the certainty and nature of this danger, and for this reason they are particularly interesting to engineers.

Reviewing the data at hand, we may feel certain that electric current may cause failure in reinforced concrete. The nature of this failure is not chemical, or at least not principally chemical disintegration, but is mechanical. Electrolytic corrosion of the reinforcement occurs, by which one volume of the original metal becomes 2.2 volumes of another substance, and this increase in volume ruptures the concrete surrounding the metal. It is clear that dry concrete is a fairly good insulator, and that its conductivity increases with the presence in it of moisture, and with the nature of the salts in solution with this moisture. It is further clear that the passing of an electric current through concrete does not materially affect its cohesive properties; that is, its compressive strength is not decreased by such action. These conclusions may be modified by further test data, but it is reasonable to believe that they will not in the main part be reversed.

With the nature of the danger to reinforced concrete of electric current thus definitely defined, one is in position to study methods of avoiding the danger. The authors of the papers contemplate several possible methods and present test data and discussions bearing on them. One method is to keep the iron negative in respect to the concrete, so that the current will be from the concrete to the reinforcement. This will accomplish the result desired; but it is a laboratory possibility only to secure the requisite conditions. Another method, which is likewise a laboratory possibility only, is confining the current to alternating currents of equal positive and negative wave forms. A third method, which seems at first glance more promising as a practical resource, is to render the concrete non-conducting by filling the pores with some non-conductor or by an insulating coating. Tests made with blocks treated by the Sylvester process (soap and alum) showed no particular value for the treatment. The possibilities for an insulating paint appear small in actual construction work; the concrete must be dry before the insulation is applied, the material must be completely insulated, and the insulation must remain intact and in good condition.

The three methods so far referred to for overcoming electrolysis are based upon the idea of either changing the nature or direction of the current or of securing a concrete which will be a perfect insulator. The next thought naturally is: Can the reinforcement itself be protected? Two possibilities of this nature suggest themselves. One is to coat the steel with some metal which will make the conduction of the current from the steel to the concrete metallic instead of electrolytic; the other is to cover the steel with an insulating compound which will cut off all flow of current from the reinforcement to the concrete. The tests made to determine these possibilities give rather negative results. They indicate that an aluminum plated reinforcement may quite likely solve the problem, and that a paint has yet to be found which will be a perfect permanent insulator, assuming that coating reinforcement with paint has no other objections.

At this point it is instructive to notice the results of the tests made to determine the effect of a paint coat on the shear or holding power of steel embedded in concrete. It seems likely that engineers will be loth to give up efficiency in holding power to the extent indicated, for anything less than a very serious menace not otherwise possible to escape.

Summarizing the facts which are presented by these laboratory studies, we obtain the general conclusion that electric current can cause electrolytic corrosion tending to destroy reinforced concrete, and that no practicable means as yet, offer themselves for preventing this corrosion where the dangerous current is present. Theoretically this appears to be somewhat appalling; practically it is not easy to work up a very high degree of terror over it. Like the corrosion of steel skeleton buildings so frequently prophesied some years ago, the possibilities for trouble are great, while the probabilities are negligible. An insolated reinforced concrete structure is not so very easily got at by electric current in a manner to cause grave danger. In the nature of things, too, the places where dangers will occur are those where considerable damage in detail can occur without injuring much the integrity of the structure as a whole.

In the above connection, special interest attaches to the recently issued draft report of a standing committee of the British Concrete Institute, on the rusting of steel in concrete. The report is based on replies received in response to a circular letter sent early in 1909 to 1,000 engineers and others engaged in concrete construction, asking for the results of experience and investigation as to whether rusting of steel takes place when the steel is embedded in con-

---

Engineering and Contracting, July 5, 1911 crete. The following the the conclusions of the committee:

"Reinforced concrete will last as long as plain concrete in any situation, provided that certain special precautions are taken during its construction. The precautions to be taken are as follows:

"The materials (cement, sand, and stone) must be of good quality. They must be most carefully and thoroughly mixed and scientifically proportioned, so as to be practically waterproof and air-proof. The mixture must be fairly wet, and must be well compacted into position so as to minimize voids. The aggregate should be as non-porous as possible, and any aggregate which is known to have a chemical action on steel should be avoided. The aggregates should all pass through a ¾-inch mesh. The concrete covering should in no case be less than ½-inch; and it is suggested that if round or square bars are used, the covering should not be less than the diameter of the bar. In structures exposed to the action of water or damp air, the thickness of covering should be increased at least 50 per cent., or the size of the aggregate should be reduced so as to insure a dense skin. In the case of structures exposed to very severe conditions, the concrete might be covered with some impervious coating, as an extra precaution.

"The reinforcement should be so arranged that there shall be sufficient space between one piece and its neighbor to allow the concrete to pass and to completely surround every part of the steel. All steel should be firmly supported during the placing of the concrete, so as to avoid displacement. It should not be oiled or painted, and thick rust should be scraped and brushed off before placing."

Pressure of Ground Water on Tanks

The behavior of underground reinforced concrete storage tanks when subjected to external pressure from subsoil water was commented upon by Mr. H. Richardson, surveyor to the urban district of Handsworth, England, in a recent paper before the Institution of Municipal and County Engineers. The excavation for the tanks, he stated, was made in very wet, soft sandstone, the site being only 150 yds. from a river. The subsoil, 5 ft. below the roof of the tanks, was made ground, free from water, but below that level to the bottom water-bearing sandstone was encountered. During construction the pits were drained by pumps and after the concrete had been placed the working space around the tanks was filled in and the ground water allowed to assume its normal level.

It was known that the dead weight of the tanks themselves, except a small portion upon which the engine house is built, would be insufficient to maintain their stability against the upward pressure of the subsoil water, and the designers of the tanks adopted means for anchoring them down. The floor of the tanks is extended outwards to make a projecting sill all around, 18 in. beyond the outer face of the walls. This, Mr. Richardson states, should have had the effect of anchoring down the tanks and enabling them to resist the upward pressure of the subsoil water which stands at a height of 16 ft. above the floor of the tanks. As the subsoil water began to attain its normal level it was found to be lifting the tanks at the end furthest from the engine house, and as the water increased in height the tanks came further out of the ground; the maximum displacement was 6½ in. The subsoil water pumps were at once re-started and the water level lowered, water being at the same time admitted into the tanks so that the levels inside and outside were soon equal, the result being that the tanks went back into position with practically no damage, the only serious fracture being where the inlet pipes passed throught the walls of the tanks. Apparently the reason why the anchor or sill was ineffective was because it was covered only with the filled-in material around the tanks, which compressed as they rose. This was afterwards remedied by filling the trench all around the tanks with concrete, which tended to hold the tanks in place.

Tar-Macadam Roads in Scotland

The roads laid with tar macadam several years ago in this part of Scotland have fulfilled all expectations as regards durancy and cleanliness. It is a noticeable fact that the enormous increase in automobile traffic in recent years has told very heavily on such sections of the highways laid with the ordinary macadam surface, while the surface of tar-macadam roads remains practically intact.

It has been found that to convert an ordinary macadamized road into a tar-macadamized road it is not sufficient simply to cover the old macadamized surface with tarred metal. The surface must first be "scarified." The road rolling engines are now provided with an instrument attached behind one of the driving rollers of the engine. This instrument acts somewhat in the nature of a plow. The effect is that, as the engine progresses, several steel points penetrate several inches below the surface of the road and tear it up into the condition of a plowed field. When the whole of the original surface has been so "scarified," the tarred metal is laid upon it and rolled in. If the surface is not scarified, but the tarred metal simply laid down upon the old surface of an uneven macadamized road, the finished road soon begins to show unevenness of surface, and finally it is apt to break up at various points.

Experiments with Pavements

It has been found by experience that granolithic or cement foot pavements are more satisfactory than foot pavements by the Walker system of tar macadam, although the tar-macadam pavement is more agreeable to walk upon. It is observed that certain parts of a foot pavement are used by pedestrians more than other, for example, close to shop fronts, close to corners, and, in country districts, close to the inner side of the pavement. The effect of this on a tar-macadam sidewalk is that about one-fourth of the surface becomes worn to such an extent as to require patching, thus spoiling the appearance of the pavement. The dripping of water from eaves of buildings also appears to have a disintegrating effect upon tar-macadam pavements.

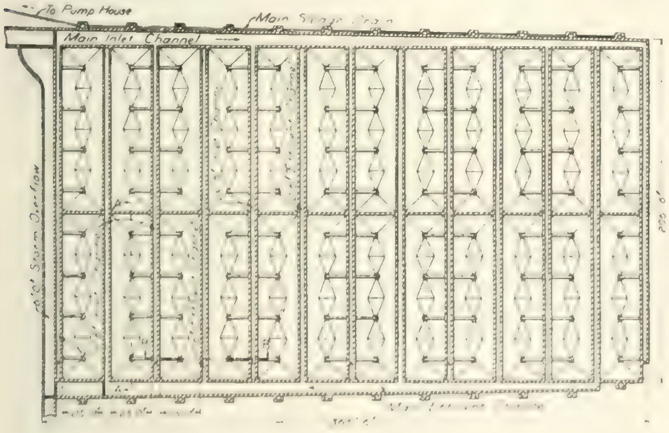
In hot weather tar-macadam sidewalks (and, to a lesser degree, roadways) become distinctly soft, an important fact that should be seriously considered by road makers desirous of introducing the tar-macadam system in very warm climates. The science of chemistry may yet discover some sufficiently ciscid substance to be used with or substituted for tar, which after setting, would not become unduly soft during the heat of the day.

Toronto's Proposed System of Drainage

Extensive Construction for Proper Disposal of Sewage -Part of the System to be in Operation This Year—General Layout and Difficulties Encountered

The rapid growth of the city of Toronto during recent years has occasioned in many ways the necessity of improvement in the public water supply and disposal of sewage. The civic departments responsible for these improvements have each solved their problems and it is to be expected that a year's time will see Toronto obtaining its water from the best available part of Lake Ontario, subjecting it to a most modern filtration treatment to be followed by further sterilization before it passes through the mains to the consumer. After use the waste will be subjected to interception and clarification, and will be discharged into the lake through a long submerged outfall pipe.

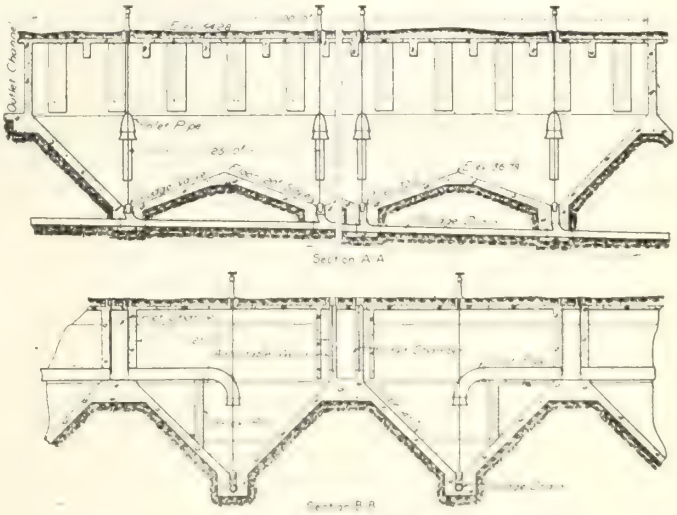
The coming of this event is being eagerly looked forward to by citizens of Toronto. The present intimate relation between the water supply and sewage problems has long been serious. It is true that the present intake is over two miles distant from the nearest existing sewer outlet, but it is a fact that the discharge of untreated sewage into the bay at various points has in stormy weather created conditions which analyses of water supply have proven to be really dangerous, and deeper than sentiment. Then too the present system maintains a prolonged nuisance owing to the decomposition of organic matter along the water front during the summer months. Thus the completion and commencement of operation of the new main drainage system will mean much to Toronto from an aesthetic as well as from a sanitary standpoint. Apart from the interests of amusement parks and summer residences there will undoubtedly be a perceptible increase in the value of property along the water front extending eastward for a distance of several miles.



Completion of Settling Tanks, Main Drainage Works

The main drainage works will comprise, when finished, a high and low level intercepting sewer, an electrically operated pumping station for low level flow, a screening and sedimentation plant, and a submerged outfall line of pipe extending into Lake Ontario, the point of discharge being five miles east of the present waterworks intake, and 3,500 feet from shore where a depth of 30 feet of water obtains. The aim of the system is not a high degree of purification, but such a screening and sedimentation treatment as will produce an effluent highly diluted and properly devoid of nuisance creating powers. The tank treatment and disposal by dilution was developed under the direction of Mr. C. H. Rust, city engineer, Mr. Rudolph Hering, of New York, and Mr. J. D. Watson, of Birmingham, England, the latter two engineers having been called into consultation for advice regarding details of the work. Their conclusions were published in part in a paper on this subject by Mr. C. H. Rust, in the Contract Record of November 9th, 1910.

Illustrations showing the general arrangement of the settling tanks are shown herewith. A site for these was selected near the foot of Morley avenue in the east end of the city where the low lying marsh bordering upon Ashbridge's Bay furnishes an area upon which the tank sludge could be satisfactorily disposed of, by mixing it with the dry refuse and spoil which is being dumped there to fill up the marsh. According to the advice of the experts alternate layers of tank sludge and city refuse, not exceeding two feet in thickness, will provide a suitable feeding ground for nitrifying bacteria, to very speedily reduce both constituents into a non-offensive substance.



Sectional Elevation of Settling Tanks

Before the sewage enters the settling tank, the heavier solids in suspension will be removed by mechanically cleaned screens. The screens will be made up of ½-in. bars, with clear openings of ½ in. between each pair, and the cleaning apparatus will consist of teeth, mounted upon a mechanically driven endless chain. The rakings from the screens will be discharged into bucket conveyors, and disposed of.

After passing the screens, the sewage will enter the settling tanks, and from them be carried out into Lake Ontario through a long submerged pipe line. There are 24 separate tank units, each measuring 100 x 25 ft. in plan, and arranged as shown in one of the drawings. They are built of concrete and are covered by a 5-in. reinforced concrete roof slab, supported by transverse beams. The sides of each unit are vertical for a distance of about 10 ft. from the top, and below this point are built at a slope of 45 deg. The concrete bottom of each unit is 1 ft. thick and is built to form a series of three ridges and four valleys, the latter each being connected through a 9-in. sluice valve to a 10-in. cast-iron sludge drain leading to the pumping station. The height of the flow line above the lowest point of the bottom will be about 16 ft., and the capacity of each tank is approximately 150,000 imp. gal at the present flow line. The inlet and outlet channels are so arranged that any number of tank units may be operated or cut out of the system as desired. Screened sewage first passed into a main inlet channel extending along the entire north side of the plant, from which lateral channels are carried at right angles between alternate rows of tanks, so that one lateral serves as a feeder for four tank units, except on the ends, where one lateral channel serves only two tanks. From the lateral inlet channels sewage enters each tank unit through four 18-in. cast-iron pipes controlled by sluice gates. These pipes extend out to the centre of each tank and their ends are supported by brick piers. The flow through them is made to discharge downward into the tank through a 90-deg. bend. Sewage leaves each tank through 13 outlet openings, through which the flow is controlled by adjustable weirs. In front of each outlet is a reinforced-concrete baffle plate to prevent scum or floating matter being carried out into the bay. The outlet openings connect directly with lateral effluent channels, which carry the flow into a main effluent channel which extends along the south end of the tanks and connects with the outfall line into the lake. Provision is made for by-passing the tank through a 6-ft. storm overflow. A battery of six Venturi meters will be installed for the measurement of the high and low-level sewage after passing into the sewage tanks; they will be located just east of the screens and pumping outfit.

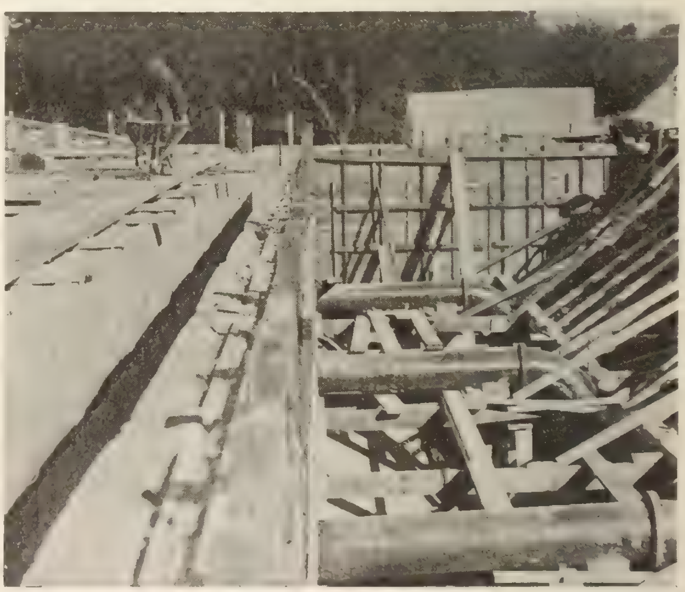
At the present period of construction the concrete bottoms and side walls of the settling basins have been completed. To date 50 per cent. of these have been roofed, and 25 per cent. are complete including back fill.

Settling Tanks, Preliminary Stages of Construction

The disposal works are so located that about two-thirds of the entire sewage of the city will be intercepted by the high level line and carried by gravitation to the settling tanks, while the remaining one-third collected by the low level interceptor will flow by gravity to a pump well at the east end of the line, from which it will be raised through a height of 22 feet to a point of discharge above the elevation of the flow line in the tanks.

The system has been designed for a maximum carrying capacity of 200 Imperial gallons of sewage per capita per day, based upon the assumption that in 1930 the city's population will be 550,000. The interceptors will be made large enough to carry all of the dry weather flow when running a little over half full, leaving the balance available for storm weather.

The size of the sewer section and the grade of the line were based on the assumption that one-half the average daily flow would be discharged in eight hours, the allowable velocities of the flow being fixed between limits of 2½ feet and 4 feet per second. The area drained when the system is in operation


Inlet Channel, Pipes and Forms for Side Walls

will be about 30 square miles. The drainage of Toronto is from north to south and the topography of the city made it possible to locate high and low level interceptors approximately parallel to each other and also parallel to the shore line of Toronto Bay, the alignment in both cases being almost due east and west.

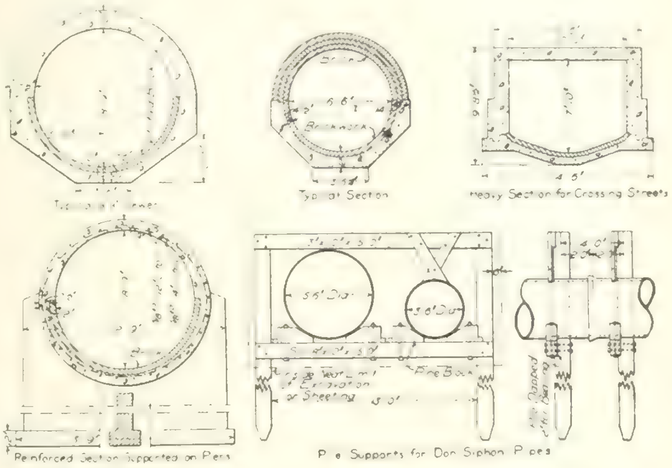
The High Level Interceptor

The portion of the high level interceptor now under contract or completed extends from Garrison Creek to the disposal works, a distance of about 5½ miles, although it is proposed to extend the line westward from Garrison Creek an additional 2½ miles. A connection between the high-level intercepting sewer and an existing 6½-ft. circular brick sewer in the vicinity of Garrison Creek is made by a branch line comprising 1340 lin. ft. of 5-ft. reinforced concrete pipe. This work is included in section 6 of the main drainage work and the contractor is the Orpen Company, of Toronto. The pipe is of the Meriwether lock-joint type, and was laid in open trench ranging in depth from 34 ft. at the upper end to 18 ft. at the lower end, except where the line crosses under Queen street in tunnel. At this point there was encountered an old masonry culvert, portions of which had to be cut out to allow for the new work; the short stretch of tunnel was heavily timbered throughout its length. At the upper end of the Garrison Creek branch line a bellmouth connection is made with the existing 6½-ft. sewer and the dry weather flow diverted from the latter by means of a weir whose crest is 1 ft. 6 in. above the invert. During flood periods the storm water will pass over this weir and be discharged through the old outlet, thus preventing the high-level interceptor from being surcharged, the flow into the interceptor being further regulated by a penstock gate at its upper end.

The high level interceptor(including its branches and extensions) will be, when finished, approximately 50,000 feet in length. It is intended to throw into operation about 30,000 feet of this work this fall, of which 27,000 feet have already been completed. It will have a circular section which varies in diameter from 6 ft. to 9 ft. 6 in., except the portion in the vicinity of the settling basins, where a special flat rectangular section will be used on account of lack of head room. At Garrison Creek the interceptor has a diameter of 6 ft.

Settling Tanks partly completed showing Manholes, Pedestals, etc.

The section is generally of plain concrete and the lower half of the inside is lined with one course of vitrified brick. The specifications allow for two alternative types of construction, the only difference between them being that in one case the arch is of concrete and in the other is formed by three rings of sewer brick. The first two sections of work, east of Garrison Creek, comprising, respectively, 6481 and 4211 lin. ft. of sewer, were awarded to J. Wagner & Son, of Cleveland, O. The next section, No. 3, extends easterly 6421 ft., terminating at the Don river, which flows in a southerly direction and empties into Toronto Bay; section 3 is built by the Godson Contracting Company, of Toronto. The interceptor between Garrison Creek and the Don river is being built in open cut and with this method of construction a plain concrete arch is used. The line extends through Adelaide street within two blocks of the City Hall and on account of the congestion of the streets in this vicinity sections 4 and 5 and part of section 3 are being built in tunnel. Sections 4 and 5 in tun-

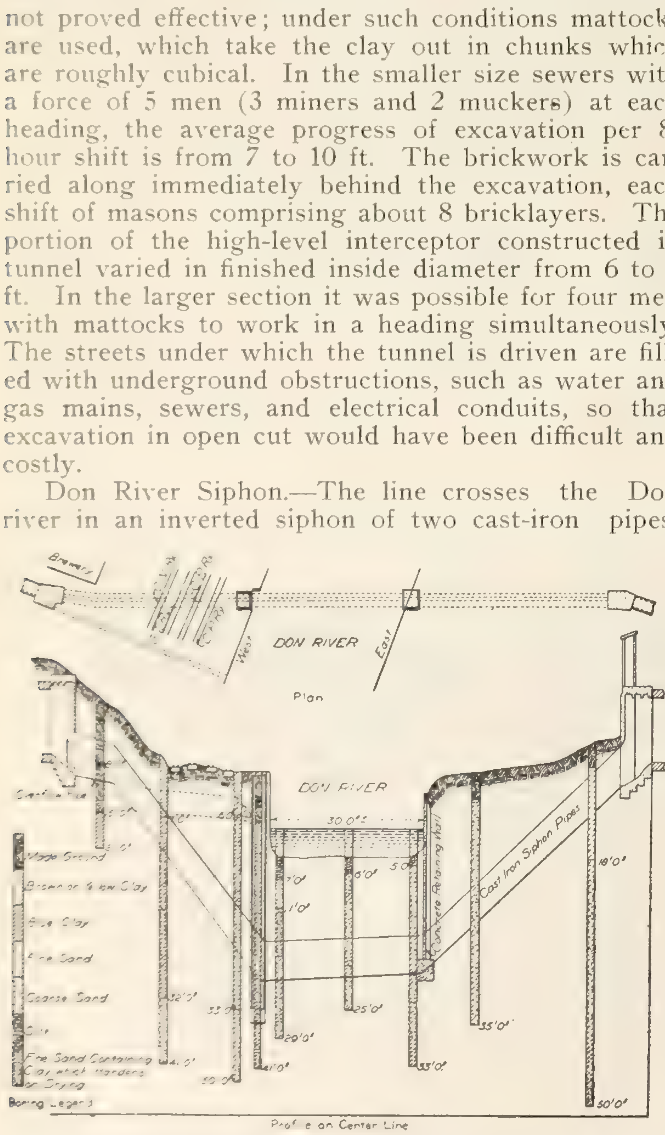

Typical Section
Brickwork
6.6'
Heavy Section for Crossing Streets
4.5'
5.6' Dia.
3.6' Dia.
Fire Box
3.0'
4.0'
Reinforced Section Supported on Piers
Pile Supports for Don Siphon Pipes

Sections of Interceptor at Various Points in the Line nel are entirely of brick. The total length of tunnel is about 3½ miles.

Tunneling in Clay.—On the tunnel work shafts were put down along the side of the street at about 400-ft. intervals and headings driven in both directions from their bottoms. The material encountered was a stiff blue clay for the most part and was practically watertight, although at some places where the clay was mixed with sand timbering was required for there was a tendency for the material to run and some leakage was encountered; in the stiff clay no timbering was required and it was possible to take the material out almost exactly to the desired section. The excavation was made by slicing long strips of the clay from the face of the heading with a draw-knife. This tool is simply a U-shaped band of steel with two wooden handles. In the stiffer material four men are required to operate it.

The clay falls from the cutting edge of the knife in strips from 1 to 2 ft. long and is loaded into buckets by one man who also pushes the material to the shaft bottom along narrow-gauge lines of track. In some places the clay is mixed with small boulders and in material of this character the draw-knife has not proved effective; under such conditions mattocks are used, which take the clay out in chunks which are roughly cubical. In the smaller size sewers with a force of 5 men (3 miners and 2 muckers) at each heading, the average progress of excavation per 8-hour shift is from 7 to 10 ft. The brickwork is carried along immediately behind the excavation, each shift of masons comprising about 8 bricklayers. The portion of the high-level interceptor constructed in tunnel varied in finished inside diameter from 6 to 8 ft. In the larger section it was possible for four men with mattocks to work in a heading simultaneously. The streets under which the tunnel is driven are filled with underground obstructions, such as water and gas mains, sewers, and electrical conduits, so that excavation in open cut would have been difficult and costly.

Don River Siphon.—The line crosses the Don river in an inverted siphon of two cast-iron pipes. The width of the stream at that point of crossing is about 130 ft. and the depth of water 5 ft. The two lines of pipe are respectively 3 ft. 6 in. and 5 ft. 6 in. in diameter and are spaced 6 ft. apart on centres. For the present the smaller line will have a capacity sufficient for the maximum dry weather flow and the 5 ft. 6-in. pipe will be held in reserve for a future increase in the quantity of sewage to be handled or used during flood periods to carry an excess of storm water. The regular high-level intercepting sewer section terminates in a concrete siphon chamber where the flow into either or both lines of cast-iron pipe is controlled by stop planks.



Sketch of Siphon under the Don River

There is also a blow-off chamber on the west bank of the river so that the siphon may be unwatered for purposes of being inspected and repaired.

Due to the likelihood that the Don might be converted into a navigable stream, pipes were placed so that their tops were 10 ft. below the existing river bed. The material encountered was composed of fine sand containing clay and the trench was excavated and the pipe laid within the walls of a cofferdam. The pipe for both lines is the bell-and-spigot type in 8-ft. lengths, the joints being poured with lead. In order to insure the permanent alignment of the siphon and prevent breaks at the joints due to settlement, the line is carried under the river by timber pile bents, there being two of these bents for each 8-ft. length of pipe.

The work was started by building a wooden flume to carry the flow of the river, and by driving four rows of sheet piling across the stream, two on either side of the pipe line. The material excavated within the inner cofferdam thus formed was deposited between the inner and outer rows of sheeting on the upstream and downstream sides. For the outer cofferdam Wakefield sheeting was used, being made up of three rows of 2 x 12-in. hemlock planks, 16 ft. long, held in place by 3 x 12-in. waling strips, bolted to piles spaced 8 ft. centre to centre across the stream.

The two inner rows of sheeting were made of Southern pine 30 ft. long, 6 by 12 in. tongued and grooved planks. The minimum distance between the inner and outer rows of sheeting was about 40 feet. The pipes were handled by a derrick plant on the west side of the river and also by an A-frame carriage, which ran on tracks supported over the trench. The larger pipes weighed about 5 tons per 8-ft. section.

The method of supporting the pipe on pile bents is illustrated in one of the drawings. Pine sills 8 by 12 in. by 15 ft. extended between two rows of piles and timber blocks were bolted to them as shown to hold the pipe in place. After the pipe had been placed men were sent through it and caulked the joints from the inside with lead wool. The Don river siphon work was done by the firm of Ryan & Reilly, of Philadelphia.

East of the Don river the standard sewer sections are used, and, with the exception of some 200 ft., all the work is being done in open cut. The lengths between the Don river and the sewage pumping station which forms the end of the line is divided into four sections, on which the contractors are the J. H. McKnight Company, of Toronto; John Wagner, of Cleveland; J. W. Gawne, of Cleveland, and Leham, Nicholson & Jerou, of Cleveland. One portion of the line crosses filled ground, and here a special reinforced concrete section, supported on piers, was used. The details are shown in one of the drawings which, together with their descriptions, are reproduced from the Engineering Record of March 18, 1911.

At the easterly end of the high level interceptor it was necessary to change from a circular to a rectangular section, 10 ft. wide and 7 ft. 10 in. high, inside dimensions, for the grade of the sewer was not far enough below the ground surface to have permitted the use of the standard circular section. The rectangular section has a vitrified brick invert and a flat roof slab, reinforced as shown in one of the drawings.

Low Level Interceptor

Construction on the low level interceptor, of which mention has been made, has been started. and over 5,500 feet of the 26,000 feet has been laid. This sewer will in general be parallel to the high level line, the two terminating at a screening and pumping plant. The low level interceptor will have an egg-shaped section for 2 miles, this shape having been adopted to give the maximum headroom, since this part of the line will be built in tunnel. The remainder will be a circular section ranging in diameter from 4 feet to 5 feet 6 inches, 2½ miles of which will be constructed of reinforced concrete pipe.

Sewage collected by the low-level interceptor will flow by gravity to the east end line, and there will be lifted about 23 ft. by a pumping plant consisting of four centrifugal units with a combined capacity of 100 cu. ft. per second. Ordinarily the pumps will be driven by electric motors, but an auxiliary gas-engine plant is to be installed, in case of accident to the electrical equipment. In addition to raising the low-level sewage to a point from which it can flow by gravity to the settling tank, the pumping plant also will handle the tank sludge, forcing it through pipe lines to the disposal area of Ashbridges Marsh.

A Section of Outfall Pipe in Process of Lowering

Submerged Outfall.—From the settling tanks sewage is discharged into Lake Ontario through a 5-ft. submerged effluent carrier, consisting of about 1600 ft. of reinforced concrete pipe and 3600 ft. of riveted-steel pipe. The concrete pipe was cast in 24-ft. sections, with a cast-metal flange at either end. The pipe sections were carried out to place on barges and lowered on to cross-timbers between rows of piles, spaced 8 ft. apart on centres. The sections were bolted up under water by divers; a piece of kiln-dried pine was used as a gasket between each pair of pipe flanges. Each length of reinforced-concrete pipe weighed about 16½ tons; the reinforcement consisted of expanded metal and longitudinal steel bars. The steel pipe is built in 50-ft. lengths, two of these being bolted up on shore and laid at one time. The experience at Toronto has been that the steel pipe is preferable to the 24-ft. sections of reinforced-concrete pipe, both from standpoint of ease in laying and freedom from danger in cracking. The submerged steel pipe also is supported at the bottom on pile bents, spaced about 12½ ft. on centres. The joining of successive sections is accomplished under water by divers, and a wooden gasket is used between flanges, as was the case with the reinforced concrete pipe.

The last 500 ft. of steel pipe line tapers from 5 to 2 ft. in internal diameter. In designing the outlet portion of the line an effort was made to secure the maximum dilution and dispersion of the sewage, by allowing it to leave the pipe through a series of small holes in its sides. In the 500-ft. tapered section of pipe, therefore, 4-in. holes were made at intervals of 8 ft. 4 in. on either side. The sewage discharges in about 30 ft. of water, and, with the scheme of distribution adopted, no nuisance at the surface is anticipated.

Earth Dams for Reservoirs

Questions that enter into the building of reservoir dams are generally complicated and frequently of greater importance than they appear at first glance. A study of the water supply should, of course, precede the location of any reservoir, and this must include the annual fall over the entire watershed. After the water supply, the next most important consideration is the nature of the foundation. Whenever possible an earth dam should be founded on bed rock. A mixture of sand, gravel and clay forms the best material for dam construction, and if this mixture is laid on a solid foundation in a dam of proper size and design there will, as a rule, be little or no need of a core wall. It is important to determine in advance the angle of saturation in a dam of the materials that can be found at hand. For this purpose a miniature dam is often constructed and close study is given to the seepage of waters through it. The angle of repose may be obtained by trying successive slopes to determine the steepness of slope the material will stand under pressure from water.

The homogeneous earth dam is regarded as the best type by modern engineers, but the profile and dimensions of the dam must be determined by the special conditions. The angle of saturation as shown on a miniature dam of the given materials will be an important factor in determining the special design of the large dam. The site of the dam must be stripped of all vegetable growth, springs must be carried to the outer toe in bed-rock drains. The earth is dumped in rows on the dam, leveled and sprinkled, the amount of water depending on the nature of the soil. A heavy roller should then be applied. After rolling until it is thoroughly compacted, the surface should be harrowed before apply another layer. The face of the dam should be riprapped for the thickness of at least a foot. The outlet and spillway should both be separated from the structure of the dam proper, and they should be adequate for the largest flow of water in seasons of extreme flood.

The Crane Company, of Chicago, are preparing for the erection of an 8-storey building in Vancouver to cost in the neighborhood of $125,000. The construction will be of pressed brick with stone facing and will be used for store and office purposes.

Construction, Maintenance and Repair of Highways

One of the most pressing questions at the present moment is the change which it is absolutely necessary to adopt in the making of macadamized roads in order to suit the altered conditions of the traffic passing over them. In recent years a more extended use of the highways has been made in this country and the employment of traction engines, with wagons and heavy motor vehicles, for conveying produce and merchandise, and also the greater use of fast-travelling motor cars, demand that some means be adopted for protecting and improving the road surfaces, thus making them more resistent against the greater amount of wear created by the ever-increasing form of new traffic. There is no doubt in my mind that in a great many instances inferior material procured from a local source has been used, with bad results, productive of mud and dust It will not do nowadays to apply macadam to a road surface without knowing how that material will wear, and it should be laid and consolidated in such a manner as to obtain the very best results as far as its wearing capacity is concerned. The different classes of traffic which pass over our roads will have to be considered. It is only common sense that a length of road which carries heavy vehicular traffic near a city or town cannot possibly be compared with another length of road maintained with identically the same material carrying less traffic. There can be no model type of road which can be fitly adopted universally.

My practice is briefly as follows: Before spreading the granite or other material I fill up all potholes or uneven parts, so as to render the old surface as even as possible. The new material is then applied in the ordinary way, care being taken to see that every shovelful is evenly spread and thoroughly dry rolled until every stone is firmly bedded before the binding is put on. Just sufficient of this material is used to bed the stones, after which clean ½-in. chippings, to fill up the interstices, are swept about and rolled. We use good, clean, sharp pit gravel for binding purposes. When patching becomes necessary, as soon as a hollow appears, the roadman fills it with small stone, about 1½-in., care being taken not to loosen the surface previously in any way.

Dust upon our highways will never be absolutely abolished; but we can and must reduce it. I have laid several dust palliatives, but do not think we have a remedy here sufficiently good, as I find that they answer admirably for a time, but when winter comes there is an increase in the mud on the roadways, and I fear that the wearing properties of the material are reduced considerably. Tar-macadam has been laid as a pavement in many towns and cities, but the cost would appear to make its application to country roads on a large scale prohibitive. The most successful system is that of tarred furnace slag, introduced by Mr. E. P. Hooley. The method of preparing this road material, as in most cases of tar-macadam, is to thoroughly dry the stone by heating, and then to apply hot tar and mix thoroughly. Limestone was very extensipely used at first, and selected for tar-macadam, on account of its absorbent properties, while dense, blast-furnace slag of best quality, a harder and comparatively better wearing material, has since been largely adopted. When roads have a good face, and it is possible to tar-wash the surface at least once every four months, tar as a surface binder will undoubtedly be a success. It will not, of course, make a weak road, subject to disintegration from below, a strong one. A road compound throughout of thoroughly tarred material will do all that surface treatment cannot do. The failure of tar-macadam has been in a great measure due to inability to get the tar to adhere to the material to be tarred. Moisture on the material or cooling of the tar means failure to adherence, and the use of soft materials which would adhere quickly means failure through the road giving way owing to inferior material.

In order to construct a good tar-macadam road it will be necessary to have an ordinary road as a bottom, or to form as good a foundation as possible. If a waterproof road is desired, then it must be of tarred macadam. The bottom layer can be 4-in gauged material, laid and rolled, with the interstices filled up with finer tar-macadam, and the whole steam rolled. The second layer should be about ¾ in. in thickness of ⅝-in. tar-macadam, and left unrolled; on this should be applied a layer of 2¼-in. gauge tar-macadam, and rolled into the ⅝-in. and when rolled ⅜-in. tar-macadam should be swept with a brush into every crevice or open joint. As a last coating, in order to join the face, a perfect layer of 1½-in. tar-macadam should be applied and after the roller has passed twice each way over its face, ⅝-in. tar-macadam should again be swept into every crevice, so that a perfect surface is obtained.

---

* By W. A. Norris, in The Contract Journal.

The New Union Bank

The Union Bank of Canada is erecting a building at the southeast corner of King and Bay streets, Toronto, and will have it ready for occupation in a short time. Several photographs showing the exterior of the building and its location are reproduced herewith. It will be a fireproof structure of glazed terra cotta and steel, and will be built on nineteen concrete caissons sunk to bed rock. The building will be five storeys in height, including mezzamaine. The structure is faced with Crotch Island granite up to the sill line.

South-east corner King and Bay Streets, Toronto, showing Union Bank and Toronto General Trusts Building.

The corridor floors are of Tennessee marble, while those in the offices above will be maple finish. The banking rooms will occup the entire main floor, the interior walls of which are finished in Botticino, Escalette and Formosa. The top floor of the building will be devoted to the offices of the inspector, board and president, while the mezzamaine and second floor will be occupied by the A. E. Ames Company, Limited. The remainder of the building will be devoted to offices, the interior woodwork of which will be of quarter-cut oak. The interior woodwork on the banking floor and mezzamaine will be of mahogany. Fireproof partitions throughout the building are of four and six-inch tile of National Fireproofing Company design. The firm of Darling & Pearson are the architects, while the building was built by H. C. Hitch & Company, of Montreal and Toronto.

Union Bank of Toronto, H. C. Hitch & Co., contractors.

Hudson's Bay Railway Bridge

Delivery of steel for the big railway bridge across the Saskatchewan River at The Pas will start in the near future. This announcement was made recently by Mr. John Armstrong, chief engineer in charge of construction of the Hudson's Bay Railway. Word has been received from the Canada Foundry Company that it will shortly start erecting.

The bridge is planned for a 12-foot traffic section each side of the railway track. At the present time everything is in readiness for the first three spans. The piers have been completed as far as the pivot pier, and the three fixed spans can be proceeded with at once. There are two piers still to be completed on the north side, but the shore piers are done. The cofferdams are all in for the uncompleted piers, and as soon as the flood water recedes they will be pumped out and the placing of concrete rushed.

Unlike rivers farther to the south the freshet in this section of the Saskatchewan comes in July, when the flood waters from the foothills and upper levels of the Rockies come down. This year the floods have been more than usually heavy and to save the great additional expense the work on the two piers has been partially called off. It would have cost a great deal to carry the cofferdams above flood level and the delay means only a couple of weeks lost.

The engineers have been exceptionally fortunate in their selection of a bridge site, though the character of the bottom has added somewhat to the cost of the work.. A hardpan bottom was encountered at a depth of six feet which was so solid that it was impossible to drive the ordinary sheet piling. This necessitated a delay while the contractors could send for sheet piling of the interlocking variety with which to make a water-tight cofferdam. In fact the bottom was so extremely firm that picks and shovels were useless in removing it to the desired depth, and dynamite had to be used. The excavation has been carried down six feet so as to be below any danger of scouring due to the rapid current of the river. Three river piers and two shore piers now rest on this bottom.

The annual report on the samples of Portland and other cements examined in the testing laboratory of Gross- Lichterfeld has recently been issued by Professor Burchartz. During 1909, the year covered by the report, 150 Portland cements were tested, of which 135 were slow-setting, and 15 quick-setting. Whilst all the samples withstood the cold water test for soundness, 19 failed in the boiling test. Five cements left more than 5 per cent. residue on the fine sieve. Two cements failed to reach the prescribed tensile strength after seven days, whilst twelve failed to reach the required compressive strength after twenty-eight days under water. The specific gravity lay, in the great majority of cases, between 3.05 and 3.15, or after ignition, between 3.20 and 3.25. A special series of tests showed that those cements which failed in the boiling test were inferior in strength to those which withstood the test, but most of them, nevertheless, satisfied the requirements of the Prussian Standard Specification as to strength. The figures show a very considerable increase in the average strength of German Portland cements from 1907 to 1909. The number of cements, other than Portland, examined is too small to permit of a useful comparison being made.

A bottom ballast of large stones, carrying the ordinary track ballast, was laid on the entire line of the new Shanghai-Nanking Railway in China, which is a modern, high-speed road, built by English engineers. This ballast is of 12-in. x 6-in. stones, 8 in. thick, hand packed,. while the top ballast is broken to pass a 2-in. ring. Granite is used from quarries located favorably for water transportation and from the vicinity of the railway. On the main line 85-lb. rails are used. The road is 200 miles long and is operated at speeds up to 65 miles per hour, according to Mr. Lewis R. Freeman.

It is useful that a man should knock a nail skillfully, truly and with precision, but if the action is controlled only by the instinct which causes a bird to build its nest with precision, he is no more than an instinctive animal. The man should, at the back of each knock, feel and know all the reasons and accumulative evidence which make for what is termed efficiency in work. Absolute efficiency in production is found in machine results; machine termination is the result of scientific application. The man must be superior to the machine; and must, therefore, be something more than a tool capable of producing technical results.

Recent Bridge Construction in America

General Review of Accomplishments in Canada and the United States—Popular Types of Bridges—Developments in Foundation and Caisson Work*

By Henry S. Jacoby

It is surprising to notice how few railroad bridge trusses with pin connections are being built in America at present. This tendency is not merely due to the decreased cost of foundations and piers or abutments due to the extensive use of concrete which makes the economic span shorter than formerly, but wherever an old pin span can be divided by an intermediate pier without excessive cost, two riveted truss spans or two plate-girder spans will replace it. The length of riveted trusses has been steadily increasing as the shops have changed their equipment and methods so that the maximum span has passed 400 feet, and spans between 200 and 300 feet are numerous. Accordingly, pin spans are mainly confined on railroads to crossings of the larger rivers where the interests of navigation require long spans.

The longest rivetted spans in the United States are those of the new terminal bridge over the Missouri River at Kansas City, the span being 425 feet and 6½ inches. The special reason for making this a riveted truss bridge is that one of the spans has a suspended lifting deck in which the stiff suspenders telescope into the hollow posts of the truss. The upper deck accommodates the highway and electric railway traffic, and the lower deck the railroad traffic. The bridge has such an elevation that deck trusses are used over the river in all spans except that of the lift bridge. Since structural reasons required the through trusses of the lift span to be made with riveted connections the same details were used for the fixed spans to secure uniformity.

In the United States the riveted trusses that are next in length to those mentioned in the preceding paragraph, are located in the channel spans of the Sixth Street Viaduct over the Kaw River at Kansas City. The trusses are also of the Baltimore type, with a span of 300 feet, 10 inches. Next in order come the riveted truss spans of the Idaho & Washington Northern Railroad over the Pend Orielle River at Box Canyon, Idaho, completed in 1910. The channel span is 280 feet and was erected from one end by the cantilever method without the use of falsework. The adjacent shorter span was used for this purpose as an anchor span.

In Canada the largest riveted truss bridge for railroad traffic has an effective span of 412 feet 8 inches. It is on the Canadian Pacific Railway where it crosses the French River, 43 miles south of Romford, Ontario. Special conditions also led to the adoption of this unusually long span for riveted trusses. The Cisco bridge over the Fraser River in British Columbia, erected in 1910 on the same railroad, has riveted trusses with a span of 315 feet, which are designed for E50 loading.

It is worthy of note that the longest span of a pin truss rairoad bridge remains the same to-day as in 1893, or 546.5 feet. Only one light highway bridge exceeds this in effective span, with a length of 586 feet. At present, however, the sub-structure is well advanced for the new Municipal bridge at St. Louis, popularly known as the "free bridge," in which the effective spans are 668 feet, due to the demands of navigation as decided by the United States government. This bridge is to accommodate the highway on an upper deck and a double-track railroad on the lower deck. It is to be built of nickel steel and it is proposed to begin the erection this spring.

Plans are under consideration which make it probable that in a few years the largest span for simple truss bridges will exceed 700 feet.

The larger live loads now adopted by some railroads tend to increase still further the magnitude of plate-girder construction. The construction of bridges now in progress on the Boston & Albany Railroad for E60 loading includes a plate girder for a skew span with solid floor which has an effective span of 115 feet and a gross flange section of 249.5 sq. in. exclusive of the equivalent flange area of the web.

There are at least two other railroads, both of recent construction, in which all the bridges are designed for E60 loading, the Virginian and the Carolina, Clinchfield & Ohio. They were built primarily for the economic transportation of coal, requiring very costly construction in order to secure the low grades adopted.

A number of prominent bridges are being replaced or reconstructed. The Lachine bridge over the St. Lawrence River near Montreal is to be changed from a single-track to a double-track bridge, using only simple trusses, thus causing the only statically indeterminate continuous truss bridge in the country to disappear. During the past season work was begun in lengthening the piers and in building some additional piers. After completing a new single-track bridge alongside of the present trusses on the longer piers, the old structure will be removed, many of the spans being used elsewhere on branch lines, and a new single-track structure built to replace it.

The Fraser River cantilever bridge on the Canadian Pacific Railway near Cisco in British Columbia, completed in 1884, was removed last year and will be re-erected on Vancouver Island on the Esquimalt & Nanaimo R.R., one of the operated lines of the Canadian Pacific. The Cisco bridge was replaced by three simple truss spans. The middle one with a span of 315 feet was erected by the cantilever method, using the side spans as temporary anchor spans. All of the trusses have riveted connections.

The superstructure of the Coteau bridge over the St. Lawrence River was also reconstructed last year by the Grand Trunk Railway by substituting heavier riveted trusses designed for modern loading. The trusses were built on skids on an island, and between trains one of the old spans was removed by floating it out on a barge, and a new span put in its place by the same method. One of the most interesting features of the design consists in the complete elimination of all lacing in the web members of the trusses, exclusive of the end posts. The difference in appearance due to this feature is apparent to an observer at a considerable distance. The web members are composed of two pairs of bulb angles connected by a solid web plate. This gives an H-section with a bulb at each corner of the post, thus securing greater resistance to injury in the shops, during transportation, and in erection. In some cases the section is increased by adding two plates on the outside. The value of the bulb angle in shipbuilding has long been recognized, but it appears that the value of this detail of bridge construction in Canada has not been recognized in the United States. It is claimed that it has been used in Canada for a number of years with entire satisfaction.

---

* The Cornell Civil Engineer.

An item of bridge history worth noting is the fact that in 1909 the Grand Trunk Railway replaced a deck tubular bridge which had been in continuous service since 1855. The excellent quality of the material and workmanship is attested by such long service under steadily increasing live loads.

The old chain suspension bridge over the Merrimac River between Newburyport and Amesbury, Mass., built in 1810 and strengthened for electric car service in 1900, was replaced last year by an entirely new suspension bridge of modern design. Because of their historic associations it was at first proposed to suspend the old iron link cables alongside of the new wire cables, but this plan was abandoned for fear of detracting from the handsome appearance of the new structure.

The first cantilever bridge in this country was located on the Cincinnati Southern R.R. (now a part of the Queen and Crescent route) across the Kentucky River, and was completed in 1877. At that time it was also the highest bridge in the United States. This bridge was replaced in 1910 by three simple truss spans of the same length, or 375 feet. The deck of the new bridge is 31.3 feet higher than the old one in order to improve the railroad grade. The trusses were erected by the balanced cantilever method from each tower, and without interference with traffic.

A new cantilever bridge for highway traffic has recently been built over the Ohio River at Sewickley, Pa. The anchor spans are 300 feet long and the cantilever span 750 feet.

A large steel arch bridge is being erected at present over the St. Croix River seven miles north of Stillwater, Minn., on the Minneapolis, St. Paul & Sault Saint Marie R.R., known as the "Soo line." It consists of five arch spans of 350 feet each, exclusive of the viaduct approaches. The arches contain one particularly novel feature in design, by means of which the arches have practically three hinges for dead load and temperature, and two hinges for live load. The bridge is 150 feet high.

Work has been begun on another important 3-hinged spandrel-braced arch bridge over the Crooked River in Oregon, for the Oregon Trunk Railway. Its span is 40 feet. This railroad is to connect with the Spokane, Portland & Seattle Railway at the Falls of Columbia River at Celilo by means of a bridge with simple truss spans, which is now under construction.

A number of direct lift bridges have been built in the last two years and others are now under construction, thus indicating a considerable revival of the type of the South Halstead Street bridge in Chicago, completed in 1894. Previous to that time the type in which a simple span is lifted vertically with the aid of counterweights had only been used for very short spans like those over the Erie Canal.

One span of this type is in the new Mississippi River bridge at Keithsburg, Ill., on the Iowa Central Railway. The span is about 230 feet and the lift about 45 feet. The inclined legs of the towers are connected to the adjacent fixed spans, and in case the river channel shifts the towers may be transferred and another span arranged to lift. Another one completed last year is the Hawthorne Avenue bridge at Portland, Ore., which has a lift span about 244 feet long. The width of this highway bridge is 63 ft. 8 in., and the vertical lift is 110 feet.

Reference has been made previously to the lifting suspended deck of one of the spans in the Kansas City bridge, which gives a clearance of 55 feet for steamboats. At Portland a bridge is under construction in which a suspended deck is to be lifted for vessels requiring a low clearance while the entire span is lifted for higher clearances. At Chicago the direct lift has been adopted for a skew span on the Pennsylvania Lines. The span is about 217 feet between centres of bearings and the vertical lift about 130 ft. Several other examples of this type are located in Arkansas, Idaho, and Washington, and during the past year one was completed at Mohawk Place in Cincinnati over the Miami and Erie Canal.

Bascule bridges are being built extensively and their use is no longer confined to locations where it is necessary to avoid encroachment upon the adjacent frontage for docks. They seem to enjoy the especial favor of the operating departments of the railroads.

A large number of reinforced concrete arch bridges are being built throughout the country, both for railroad and highway purposes. The bridge over Rocky River near Cleveland which has the longest clear span in America, or 280 feet, was completed last year. The smaller spans of the large bridge at Spokane are doubtless completed by this time. Work on the 281-foot span was delayed on account of the accident to the centering, and in order to avoid dangers due to high water it was proposed to build the new centering on top of a steel truss bridge designed for another location, but temporarily used for this purpose.

The bridge of the Boston Elevated Railway over the Charles River at Boston and Cambridge, is unique in being the first one in which two hinges are employed. Two separate ribs are used in each span which support reinforced concrete floor beams. The stringers consist of steel I-beams on which the ordinary type of open bridge floor is laid, while between the two tracks and outside of them there is a concrete slab floor.

The spandrel walls cover the entire area about the arch ribs between the supporting pillars of the floor, but they are made hollow and as light as possible since they are not intended to carry any live load. Being adjacent to the Charles River dam special attention was given to the architectural treatment so as to give it the appearance of a monumental structure.

An interesting feature in its construction was the use of an electric locomotive to haul the cars to carry concrete from the elevator at the mixer to the various places on the bridge where it was deposited through chutes.

A bridge which deserves special mention is that completed in 1910 over the Colorado River at Austin, Texas. Its total length is about 1,000 feet, and it has eight equal arch spans. The bridge is very simple in design but of excellent form and proportions, while the overhanging sidewalks and its supporting brackets give that distribution of light and shadow which adds so much to the beautiful appearance of the structure.

Another concrete arch bridge of importance is being built on Kings-highway in the city of St. Louis. The three large spans are 140, 170 and 140 feet respectively. On account of the character of the foundation bed it was necessary to adopt an unusual construction to spread the load over a large bearing area by means of reinforced footing slabs, and vertical partitions and sidewalks forming a kind of cellular construction.

More than thirty concrete structures are included in the Hopatcong cut-off east of the Delaware water gap on the Delaware, Lackawanna & Western Railroad, which has been under construction for some time. Among these are two very large arch bridges, the one over the Delaware River being 1,450 feet long and containing more yardage of concrete than any other concrete bridge in the country. It has five spans of 150 feet in the clear, and two spans of 120 feet, beside several smaller approach spans. The Paulins Kill bridge, not far distant, is 1,100 feet long, but on account of its greater height and favorable location presents a more impressive appearance than the other.

In many cases the single arch culverts accommodate a highway and waterway in the same structure, the waterway being placed beneath the floor of the highway, in one or two culverts of rectangular cross section. On account of the high fills these structures are sometimes over 300 feet long, giving the appearance of a short tunnel. All of these concrete structures give the impression of being excellent in the character of their construction as well as in design, and this quality will undoubtedly have a good influence on future construction, because of the very large number of engineers and contractors who have visited the work on the cut-off.

The preliminary investigations in regard to foundations were so thorough that it was not necessary to revise the plans of structures after the required excavations were made. This feature deserves special mention because it is frequently not given adequate attention, and in that case it either leads to a considerable increase in subsequent cost of the structure above what it would have been if the true conditions had been known before the design was first made, or it places extra burdens upon the contractor for which he is not fairly responsible.

Considerable increase is noticeable in the construction of reinforced concrete slabs supported by concrete pile bents thus forming a trestle on which the regular ballast and track are carried. There are many localities where a low trestle must be used in order to avoid restricting the openings for flood waters. At certain intervals a concrete pier is substituted for a pile bent in order to give addition resistance to longitudinal traction. The Chicago, Burlington & Quincy R. R. has been a pioneer in this type of construction, the Chicago, Milwaukee & St. Paul, Rock Island, Northern Pacific and western railroads either have built similar structures or have adopted plans for future construction. The reinforced concrete slab for short openings has been adopted as standard on a large number of the leading railroads of the country. The track elevation of the Chicago, Milwaukee & St. Paul R. R. in Evanston, is notable for its successful application of the slab and ballast deck with intermediate supports on beams and columns on the lines of the curb at street crossings.

The same railroad has made the most extensive development of the hollow abutment. The form most frequently used is the reinforced U-abutment with arched openings on the sides and slab top, the sides being merely curtain walls to support the slabs. The retaining wall feature is largely eliminated. In the more advanced form arched openings are run in both directions leaving heavily reinforced pillars or column to support a part of the slab floor.

The largest reinforced concrete beam which has probably been built in this country was observed last November under construction at Tacoma, Wash., where North 23rd Street crosses Buckley Gulch. The viaduct has seven spans, of which the largest is about 68½ feet. Two beams carry a total width of roadway and sidewalks of 42 feet and the floor beams are spaced a little over 7½ feet between centers. The beams in the long span are 6 feet wide and 10 feet deep. A detailed description of this design will doubtless be prepared for publication in due time by the Consulting Engineers, for the engineering profession must be interested in the design and construction involving beams of such magnitude. Their observation under traffic ought to furnish important information as a guide for future designs.

The use of concrete piles for the foundations of both bridges and buildings is extending very rapidly. Most of those now in service are of patented forms in which the pile is cast in place after a hole is formed by means of a steel core or a hollow pipe fitted with a point. Frequently the opening is lined with sheet iron to maintain its shape until the concrete is deposited.

In the other class employed the piles are molded in forms and reinforced in longitudinal bars which are tied together at intervals by wire. These piles are driven like timber piles with the aid of the water jet and hammer. Some of the designs are also patented while others are not. On railroad construction at least, the piles which are molded, and driven after seasoning, are regarded with increasing favor.

A new development in foundation work consists in building open caissons of reinforced concrete instead of timber or steel. At Black Rock on Niagara river a caisson of this character was successfully sunk in 1910 through 50 feet of very tough red clay to the rock bottom. The frictional resistance was found to be greater than that heretofore recorded either with or without the pneumatic method of sinking. The caisson was sunk for the pivot pier of the new swing span of the Grand Trunk R. R. bridge, necessitated by the construction of the new lock and canal built by the United States.

At Portland, Ore., caissons of a similar type were used for two bridges over the Williamette river, one for Hawthorne avenue highway bridge, and the other for the bridge of the Oregon Railroad and Navigation Co., which also accommodates highway traffic. These foundations had to be sunk to a depth of about 120 feet.

The great advantage in using concrete in these caissons is that when the sinking is completed and the interior is then filled up with concrete the walls and portions of the caisson become a permanent part of the substructure.

The use of reinforced concrete in the roof of pneumatic caissons has reduced the amount of timber very materially, and correspondingly reduced the compressibility of the roof when the pier and its load are supported. In the caissons of the McKinley and Municipal bridges at St. Louis, the timber in the roof of the air chamber consists of one layer of 12 by 12-inch and 14-inch timbers respectively, and a lining of 3-inch plank.

The progress in pneumatic foundations during the past forty years is shown comparing the construction of the foundations for the Municipal bridge in 1910 with those of the Eads or St. Louis bridge and in which the depths are nearly the same. The total time including delays was cut down over 50 per cent., the loss of human life due to caisson disease was reduced to but a small fraction of that entailed in the older structure, while the cost of the substructure per cubic yard has been reduced about 70 per cent.

As another illustration of the use of reinforced concrete in substructures, reference may be made to the protection pier of a swing bridge over Red river in Alexandria, La., on the Missouri Pacific Railway system. So far as the writer knows this is the first time that a protection pier has been built of this practically permanent material.

The use of reinforced concrete in building construction is steadily advancing. The value of a rigid building in reducing the cost of maintenance of machinery is becoming more evident with increasing experience. In one six-storey building where considerable machinery is employed the cost of maintenance is several thousand dollars a year less than in the old structure with its floor vibrating under the machines. In another case where the operatives experienced serious fatigue due to vibration in the old building, they find considerable relief since the presses are installed in the new concrete building.

In a new concrete building on pile foundations used for a flour mill, a series of gyrators weighing four tons each on the fourth floor when rotating 150 times per minute produce scarcely a tremor. When the machinery was once lined up true it remained in that condition.

It is interesting to notice the character of the floor construction in office and mercantile buildings. In Greater New York the beam and slab construction is used almost exclusively, if not entirely so. In Boston only about half of the floors are of that form, while the flat ceiling is used for the balance. In some of the narrower buildings only transverse beams about ten feet apart are used, thus interfering less with lighting from the two sides. In St. Paul and Minneapolis the flat ceiling or mushroom construction predominates in a large degree. In Chicago and St. Louis a third form is being introduced in which the beams are shallow and about four feet wide, running in both directions giving the effect of a paneled ceiling. In Seattle the flat ceiling is used only to a limited extent.

In the tall steel buildings the reinforced concrete slab floor seems to be used in the majority of cases, the slabs being supported by encased steel beams. In some of the lower office buildings steel columns are used, with enough steel in the form of horizontal bracing for the steel frame as well as for the reinforcement of the concrete beams. Such steel bracing may take the form of pairs of angles laced. They are strong enough as beams to support the forms for the concrete beams which envelope them, as well as the floor slabs.

It may be of interest to call attention to the severe test applied by the forces of nature to the reinforced concrete arches of Long Key Viaduct on the Florida East Coast R. R. The arches are full centered and have a span of 60 feet. The top of the spandrel walls is about 30 feet above mean sea level. Since its construction the viaduct has been subjected to the combined action of wind and waves in the hurricanes of 1909 and 1910. The ocean waves broke over the top and cut out the track filling, but the concrete arches withstood the fury of the storm practically uninjured.

It is interesting to find an engineer who is a master in the design of simple structures especially when the material used is timber. It is unfortunate that so many engineers have regarded the design of many of the details of timber structures as unworthy of their serious study and have turned them over to the master carpenter for solution. For this reason the development of timber design has been materially retarded, while modern conditions have not been adequately met.

In Seattle, the plans were seen of an auditorium in which all the timbers of the roof trusses were connected at the joints by spikes or nails except at the end joint where a casting and bolts were used. Since the structure was intended for temporary use, this method of framing was especially appropriate. The engineer made the design of every detail, however, the plans show the location and size of every spike, with proper spacing and relation to the grain of the wood, and a knowledge of the strength of nails based upon experimental investigation. It is readily appreciated that this method gives cheap and rapid construction.

The same engineer used the same details in the design of a truss span which in connection with a trestle was required for construction purposes at a power plant. The bridge had to be built across a deep gorge where falsework could not be used, and the only means of crossing the gorge was a suspension foot bridge that would permit one man to carry one plank across at a time. These unusual conditions were met by using planks and spiked joints in building each half of the truss, and of its connection to a counterweight consisting of a box of sand, then rolling it out on the bank until the projecting cantilevers could be united at the middle. The central span consisted of 10 panels each 16 feet long, and was designed to carry an electric locomotive and dump cars.

A number of evidences were found of a tendency to develop a more rational type of contract for construction. In the ordinary form of contract the usual tendency is to place the whole burden of responsibility upon the contractor even if there are many uncertain elements due to lack of information. In many cases the owner and his engineer omit to make the previous investigations regarding actual conditions affecting foundations or other details and as a result there is an element of gambling in the contractor's bid. Sometimes the engineer does not even assume full responsibility for his own plans.

As an illustration of a new and equitable method of payment, the contractor is to be paid for the actual cost of labor and material, plus a given percentage for the use of his equipment and organization including profit, plus a bonus of a certain percentage of what he can save below an approved estimate of cost, minus a penalty consisting of a corresponding percentage of any excess of cost over the estimate. Such a contract makes it to the interest of both parties to cooperate in advancing the work, and it furnishes an incentive to the contractor to maintain or improve the efficiency of his organization.

Another element of progress which is apparent as one observes new construction throughout the country, is the increased attention given to a systematic arrangement of the work. This is particularly noticeable in reinforced concrete building construction, and the remarkable speed with which good work of this kind is done to-day is largely due to an orderly arrangement of the work of the different groups of men engaged in the erection of forms for columns, beams and slabs, placing reinforcement, depositing concrete, and the many other operations incident to the handling of the material and placing it in position, without interfering with each other.

It is very instructive to see the careful analyses of cost for both material and workmanship which are made by some of the leading contracting engineers for buildings under construction, by means of which it is possible to prepare fairly accurate estimates of buildings of different forms and subject to various conditions. The number of elements considered at present in this connection is very much greater than was regarded necessary some years ago. There are bills of material for the time keeper, superintendent, and the purchasing department; costs of material and of labor, divided by storeys in the building; columns, beams, windows, and other details are all numbered according to a simple plan, so that every item can be located promptly. There are preliminary estimates to answer the questions that arise when a project is under consideration; official estimates for the tender of bids; and final statements of cost, and a discussion of the variations between them that may be of service in future work.

Victoria's Large Paving Project

The city of Victoria is now carrying out a great paving project. Thirty-six miles is the length of the pavement to be laid. The cost will be about one and one-quarter million dollars. Work was started on June 9th and will be finished by the first day of January, 1912. The paving consists of asphalt laid on cement. The area to be covered is 625,000 square yards.

The contract for the entire work was awarded to the Canadian Mineral Rubber Company. The statement has been made that it was the largest individual paving contract ever awarded. The company is using a plant worth $150,000. The work is being done under the supervision of J. E. Keppes.

At different points along the thirty odd miles of streets which are included in the paving contract, the company has stored immense quantities of sand to be used for the concrete basing as the work advances to that stage. Along the different streets as they are being graded, where possible, the curb and gutters are being laid, this construction being carried on at the rate of from 1,500 to 1,700 lineal feet per day.

Included in the plant necessary to such extensive operations are three steam propelled rollers, averaging in weight from seven and a half to eight tons each; an elevated grader hauled by a traction engine which directly conveys the dirt into wagons; and 104 wagons, which provode employment for from 150 to 200 men. At the headquarters of the company on the harbor front is also located an immense electrically worked derrick for lifting the sand into the bunkers from scows. Another derrick is located on the Ross Bay waterfront.

Two remarkably large cement mixers are being used in connection with the work, each weighing some 137 tons, and each capable of handling continuously from 90 to 100 tons of gravel. These plants, which are transported from place to place by rail, are each 66 ft. 5 in. in length, the maximum length of any car allowed on a railroad. The machinery by which the asphalt is mixed is interdependable in the process of turning out the material ready for laying on the streets. Machinery moves the gravel out into the large receptacle above the furnaces, another machine is there for grinding the gravel, yet another for screening is so fine that a pin head point is not overlooked. Automatically the asphalt material, while at a temperature of 360 degrees is loaded into sheet iron asbestos-lined wagons, and in this condition, with the minimum of delay, conveyed to the points where the paving is in progress. Three smaller mixers are also being used, one driven by gasoline and the other two by steam.

A Western wheeled scraper is also used in connection with the work and the outfit includes two asphalt plants.

Comparative Cost of Fireproof Construction

Philip H. Bevier, C. E., addressing a society at Orange, N. J., on "Fireproof Construction," gave the following interesting figures as to the comparative cost and arguments as to public and private utility:

"At the present price of building material, fireproof construction can be erected at a cost of not to exceed 10 or 15 per cent. more than non-fireproof, and when we consider that fireproof buildings deterioriate about one-ninth of 1 per cent. per year, as compared to 4 per cent. for ordinary buildings; that they rent better and that money can be borrowed on them on better terms; that they are vermine-proof, cooler in summer and warmer in winter, it would certainly seem a part of wisdom and self-interest to adopt a better method in every case when the building is to be of a permanent character.

"When a man builds a house in the country, it may be that he had a right to jeopardize his own life and property and those of his family and gamble with the insurance companies, but there is no question that the owner of the property in a city or town has no right to erect a structure which will be a menace to the safety of the property of the adjacent owner. This principle is clearly recognized in practice, and many of the smaller cities are adopting building codes requiring fireproof construction throughout a certain portion of the business section, and semi-fireproof buildings in less congested districts.

"If one-half of the money spent by American cities for fire losses was spent for better building construction, the annual loss by fire would soon begin to decrease. Improvement along the line of better construction can only come gradually. It can and should be hastened in thickly settled communities and the individual shown that his own pecuniary interests lie in lessening the fire waste. Old buildings cannot be torn down at once and rebuilt, but we can see to it that no more fire traps shall be built where they are a menace to other structures."

The rate at which Vancouver is outstripping Seattle is perhaps more conspicuously indicated by a comparison of building permits than in any other way. The statistics of the two cities for July and for the first seven months of the year show that in both cases those issued locally have amounted to considerably more than double those of the Puget Sound metropolis. The exact figures are $541,600 for Seattle, against $1,108,378 for Vancouver. For the first seven months of the year the Seattle total was $4,513,935, as compared with $10,296,784 issued in this city.

Some Canadian Stone Cutting Plants

The Iberville and Toronto Shops of the Norcross Bros. Company – The handling and Working of Large Stone Pillars—Description of Plant and Machinery

Views of the plant at Iberville

The Norcross Bros. Company, Limited, with headquarters at Worcester, Mass., have established in Canada two of the most up-to-date plants for the cutting and finishing of the various kinds of grante, marble and sandstone to be used for their Canadian contracts. The company has sixteen plants in the United States, with nearly $12,000,000 worth of work at present under construction. This immense business has been in the process of development since 1865, being one of the pioneer building organizations of that country. The founder of the firm was Mr. O. W. Norcross, who is now president. With him are associated Mr. Wm. J. Denholm, as vice-president; Mr. A. G. Park as treasurer, and C. A. Perry as Canadian manager.

The business established at Iberville is a thoroughly Canadian enterprise, and has associated with it a more recently installed plant on Logan avenue, Toronto, which commenced operations some little time ago and is now the largest stone cutting works between Montreal and Winnipeg.

One of the first facts which strikes anyone upon entering either of these plants is the remarkable facilities that are at hand for the handling and working of pieces of stone of all sizes. The plants are both well lighted and ventilated, and the comfort and safety of the stone cutters has been well loked after. Each plant is designed to employ from 100 to 150 men.

The working space in each plant is served by two overhead travelling cranes with continuation of track at each end of the building for yard work.

In granite cutting an important part is the keeping in excellent order all the tools and machinery used. A blacksmith shop is a very necessary department, and the above works are well equipped for this work with forges and compressed air, whilst in another department are to be found some huge grindstones for tool sharpening, each with an 8-inch face and 6 to 7 feet in diameter. The carpenter shop also is equipped with woodworking tools for the boxing of the finished product before shipment.

Train Loads of Stone upon arrival from quarries

Each plant is furnished with an air compressor system supplying in the neighborhood of a thousand feet of air per minute with additional compressors for reserve in case of accident or breakdown, all of the granite and marble cutting and chipping being performed by the use of compressed tools. The compressors are run by electric motors, those of Iberville being supplied with current generated at Chamly and transmitted to the works at 2,200 volts, part of the machinery being operated at that voltage and part requiring a step down of the current to 550 volts. In this respect the whole plant is operated on the unit system and provision has been made for further development.

The Rough Stone and the Finished Product

In their completely equipped and modern machine shops for taking care of all repairs, a very important feature in connection with the stone business, the company have in operation a large force of lathes, drills, etc., insuring prompt and quick work and independence from outside sources.

Gang Saw in operation, Toronto Plant

The Iberville plant is situated in the surburbs of the town, and has seven acres of space for operations. It has facilities on five different railway lines in the vicinity, sidings from the C. P. R. and G. T. R. being already on the land, while those from the other roads are being put in. One of the accompanying photographs shows one of four huge monolith marble columns, which are said to be the largest ever shipped out of a marble quarry in the United States. They are 32 feet 2 inches in length with an average

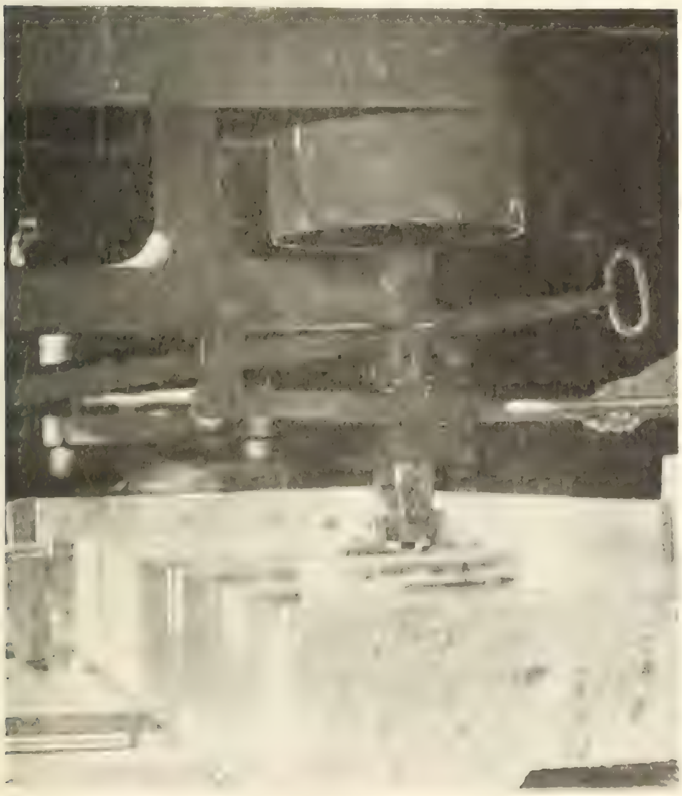
Monolith Pillar over 32 feet long, Iberville

diameter of 4 feet 2 inches, this being the size of the finished monolith shaft. They are being cut in the Ionic order of architecture for the new Art Museum to be located on Sherbrooke street in the city of Montreal. They will each weigh twenty-six tons and are worth at the quarry in the neighborhood of $800, while in the finished form their value will be between $4,000 and $5,000 each. The huge outdoor overhead travelling crane which handles these Titanic pieces has a runway of 75 feet span and 380 feet length, the C. P. R. and G. T. R. switches passing underneath.

At work on Fancy Patterns, Toronto

A brief description of the operation of the Toronto plant may be obtained from the following photographs. One illustration shows a gang saw with straight or parallel cut, of which there are two. In addition there is also a gang saw with pendulum motion in operation. These machines handle the immense blocks of rough material that come into the works and cut through them at the rate of 2½ to 3 inches per hour. The illustration shows also the method of putting chilled steel shot into the cuts to facilitate the action of the saw teeth. In contrast to these machines one that surpasses them for speed in steel and stone cutting is a circular machine with specially designed teeth, which operates through about 1½ inches per minute upon the block of stone subjected to it. For the cutting of pillars a large cylindrical saw toothed at the base is used. From it the product is placed in the turning lathe shown in the illustration, where it is operated upon by an ordinary cutting tool and brought to within one-quarter to one-eighth of an inch of the desired dimension. It is then either placed in the hands of the compressed air chisel brigade, or goes to polishing machines, of which there are a number of types. Additional illustrations show various machines and polishers used in the works. The machines, including the air compressors, are electrically driven here also.

Pillar in position in lathe



Polisher at work on Marble

The firm owns and operates a number of quarries turning out the following kinds of granite: Milford, Mascona and Bradford Red, Troy and New Hampshire Grey, Bethel white, and Windsor green. They also produce marble of the following kinds: Dorset, Danby, Tuckahoe and Georgia white. They are, from their wide experience and ample facilities, quite at home in handling granite, marble or soft stone of any color which the architect may specify, and from the foregoing description it may be inferred that greatest promptness and thorough carefullness may be expected from the well established firm.

Sand-Lime Brick Output

According to a bulletin of the United States Geological Survey, the production of sand-lime brick in the United States last year was $1,169,153, being the output of 76 factories.

Michigan led in 1910, as for several years, and reported products valued at $240,649; this was a gain of $22,423, or 10.28 per cent. over 1909. Michigan's product constituted 20.58 per cent. of the total value of all sand-lime products in 1910, and 18.97 per cent. of the total of 1909. Minnesota was the State to show the largest increase—$41,181, or 36.42 per cent.—and was second in value of product in both years; New York was third in both years, Florida fourth, and Pennsylvania fifth. Of the States for which totals are given Indiana showed the largest proportional gain, 93.70 per cent.

Several of the Milling Machines in use, Toronto

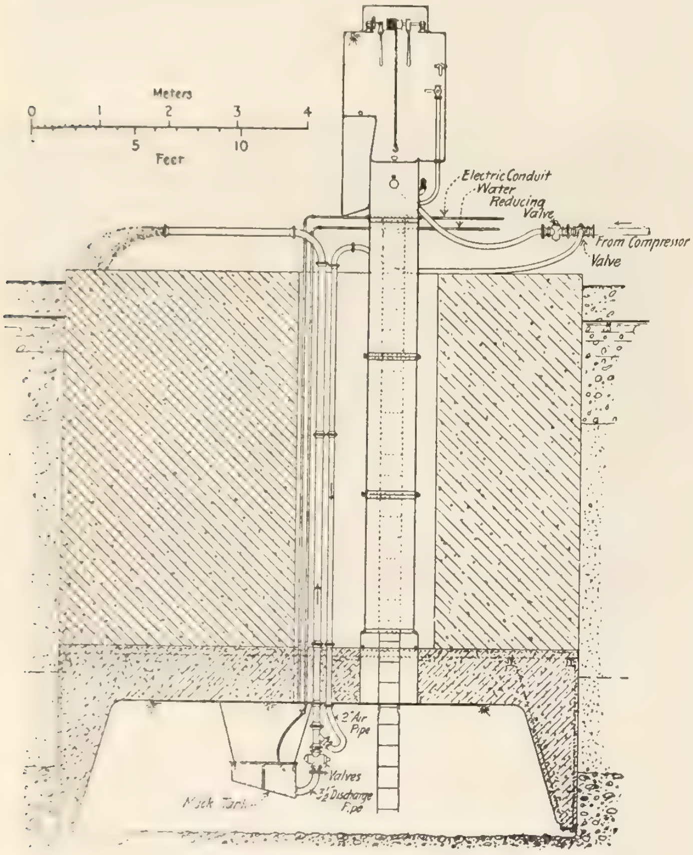
The average price per thousand received for common sand-lime brick was $6.36 in 1910, as compared with $6.39 in 1909, and $6.33 in 1908; for front brick, $10.90, as against $11.98 in 1909, $12.16 in 1908, and $10.96 in 1907. In 1910 common brick yielded 87.57 per cent. of the value of all products; front brick, 10.53 per cent.; and all other products 1.90 per cent. In 1909 those percentages were 77.12, 13.35, and 9.53, respectively.

A comprehensive survey of all the rivers and streams of British Columbia, to determine the amount of water and power available, is to be carried on during the next few years under the direction of the Canadian conservation commission. Similar work will be carried out for the other provinces. A start has already been made in British Columbia. The principal work this season will be devoted to the waste water powers on the Fraser River, Kootenay and Columbia Rivers and their tributaries.

Pneumatic Muck Ejector

The cut here reproduced from Schweizerische Bauzeitung is a diagrammatic representation of a specialized form of pneumatic muck ejector used in caisson foundation work at Aaran, Switzerland, as described by G. Luscher, its designer. The usual air supply is maintained in the working chamber of the caisson sufficient to resist the water inflow corresponding to the depth, but as pneumatic tools are used in the caisson, an air supply is maintained sufficient to operate them while exhausting into the air of the caisson. The entire air supply is in fact furnished at the higher pressure, while the caisson pressure is controlled by passing that portion of the air through a pressure reducer.

The ejector comprises a hopper-bottom much-tank, a valve discharge pipe leading from the bottom of the tank to the open air, a valved auxiliary, high pressure air pipe leading into the discharge pipe at an acute angle, and a water pipe for furnishing water to keep the contents of the tank in fluid condition. The tank is made in sections, so as to permit taking it through the air-lock. The discharge pipe as used was 3½ in. diameter, the high pressure air pipe 2 in. The latter pipe joins the discharge pipe at a forward angle of about 45 degrees.



Diagrammatic Sketch of Ejector.

In operation, the tank is filled with muck, and if this is clayey in nature sufficient water is added to enable it to be blown out, while sand is handled without water addition. The discharge valve being kept closed, the auxiliary air valve is opened, producing a strong ejector action in the discharge pipe. Then the discharge valve is opened, and the muck is blown out very rapidly. The tank is kept constantly supplied by shovelers; whenever the tank becomes nearly empty the discharge valve must be opened at once, to prevent serious loss of air from the caisson.

The working principle of the apparatus is that the caisson pressure is used only to force the material far enough for the ejector action of the auxiliary or high pressure air to take hold of it; the latter then does the main part of the lifting.

A New Industry

The John McDougall Caledonian Iron Works Company, Limited, of Montreal, have entered upon the manufacture of both plunger and electric elevators for either passenger or freight purposes. They have secured the services of Mr. Thure Larsson, for many years chief engineer of the Standard Plunger Elevator Company, of New York, and of the superintendent of construction of that company, and, at the same time, the control for Canada of the Larsson elevator patents.

For the plunger elevator, these patents include a new main valve which eliminates any bounding of the car when stopping, a new cam automatic terminal stop valve, and a new pilot or control valve which prevents any accidental movement of the car in the opposite direction when passengers are entering or leaving. The patented improvements on the electric car embody the good features of the drum and traction type and eliminate their bad ones and give greater security and economy in operation.

These elevators will be built in the company's shops in Montreal, where they have just completed 11 passenger and freight elevators of the plunger type, with lifts varying from 40 feet to 176 feet for the C. P. R. Windsor Station extension.

Raymond Concrete Piling

The Raymond Concrete Piling Company of Canada with offices at 405 Dorchester street west, Montreal, has just completed for the C. P. R. an important piece of work for a viaduct between Edmonton and Strathcona, Alta. The contract involved the placing of 1500 Raymond piles. The general contractors for the viaduct are, John Gunn & Sons, of Winnipeg.

This system of piling has been adopted for the two new sheds now being erected on the Tarte pier in Montreal Harbor for which Mr. E. G. M. Cape is the general contractor. About 1400 piles will be used on this job.

The Raymond Company has also been awarded a contract for the piling on which will be constructed an extensive addition to the Harbor Commissioners' elevator No. 2 now under construction by the John S. Metcalfe Company of Montreal. One thousand piles or more will be required on this piece of work. The original plan of this elevator provided for a capacity of 1,772,000 bushels of grain; the addition will provide for 848,000 more at the west end of the main structure. About 800 men are employed on the job. It is expected that the elevator will be equipped and ready for operation about a year from now.

By the Raymond system a sheet metal tube containing a steel core is driven into the ground to an average depth of twenty feet; the maximum depth being forty feet. When the penetration required to carry the desired load has been reached the core is collapsed and withdrawn and the shell which remains in the ground is filled with concrete. The core is conical in shape being six inches in diameter at the point and twenty inches across the top.

We have just received a copy of the Bell Bros.' catalogue describing their process for the purifying and softening of public water supplies. The booklet contains an instructive treatise on the properties of filtration systems, results of numerous tests from chemical and bacteriological laboratories, in addition to numerous descriptions of installations. The publication constitutes 80 pages of valuable matter for manufacturers, municipalities and physicists. The Bell Filtration Company, of Toronto, are Canadian representatives of the firm, whose headquarters are in Manchester, England.

Montreal News

The city has purchased a house at 209 Champ de Mars street for the purpose of a juvenile court, at a cost of $13,500. Further funds are to be voted for fitting up the house.

The Board of Control has been instructed to consider the question of making an offer for the structure of Laval University, St. Denis street, for a civic library. The administrators of the university have under consideration the removal of the institution and the disposition of the present building, and the idea of the council is to exchange a vacant lot boarded by Park, Pine and Duluth avenues. for the building now occupied by Laval University.

The police committee of the Westmount city council has made a recommendation that the council accept the tender of the St. Lawrence Wagon Company for a new hose sleigh, $265, and repairs to the ladder $210; also the tender of the Dominion Bridge Company for steel work on the new fire station for $4,420; and that of M. J. Quigley for plumbing in the fire station to the amount of $1,080. The road committee recommended the expenditure of $7,500 on drainage, sidewalks, etc.

The first meeting after the holidays of the Province of Quebec Architects' Association will be held at their rooms, Beaver Hall Square, September 5th. A committee is arranging a programme of technical papers to be read during the coming season which will be announced shortly.

The awards in the competition of plans for a new library to be erected by the Seminary of St. Sulpice, on St. Denis street, Montreal, have just been made. The first prize of $1,500 goes to Mr. Eugene Payette of 103 St. Francois Xavier street, the second of $600 to Mr. J. O. Marchand, of Marchand & Haskell, St. James street; the third of $300 to Mr. Joseph Venne, Beaver Hall Square. There were eleven competitors. The Seminary has accepted the design of Mr. Payette subject to minor alterations.

Trade Notes and Items of Interest

Building permits issued in Vancouver for the first half of the current month amount to $745,468.

Superintendent Richley, of Dill, Russel & Chambers, contractors on the Toronto filtration plant, states that their part of the work on the construction of the plant will be entirely completed late in October.

The Goodyear Tire & Rubber Company of Canada, Limited, have received an order for 12,000 feet of elevator belting, which is the rubber belt equipment of twenty-seven elevators for the Province of Saskatchewan.

The Nova Scotia Construction Company, of Sydney, N.S., has been awarded the contract for the construction of the Canadian Pacific Railway branch line in Quebec, of a breakwater at Brooklyn, Shelburne County, and of the power house for the Windsor Hotel, Montreal.

City Engineer Blanchard, of Lethbridge, is making a number of changes since taking up his official duties in that city. One of these is a complete reorganization of the city engineer's department, dividing it into three branches, a record branch a public works branch and the buildings branch, the heads of each being directly responsible to the engineer.

Experiments in France have shown that natural turf is an excellent material from which to form beds for the filtering of sewage. A volume of between three and four cubic meters of sewage can be purified every day for every square meter of the surface of the turf. A turf filter that has been in use for some time shows no diminution of efficiency.

The contract for the balance of the Canadian Northern line from Kamloops to the British Columbia-Alberta boundary reaching rail-head from the prairies was awarded recently to the Northern Construction Company, and the Cowan Construction Company conjointly. This is the largest contract that has been let for some time in the west and one of the largest ever let in Canada. It will be a most difficult piece of work as the greater part of it will be mountain construction.

A faulty piece of construction work is much in evidence in the city of Hull, Que. The city's main sewer, recently laid, has sunk in places to a depth of nearly five feet, and the pipes have broken a number of joints, the result being that the sewage is flowing overground into the lake at several points. Along the lake, where the earth is not of a sustaining nature, two rows of tiles were driven down to the rock about two feet apart ,and carried beams which supported a row of 2-inch planks, upon which the pipes were laid. The white mud into which the piles were driven has not proved hard enough to support them laterally and they have swayed out of plumb. The contractor will be required to reconstruct and repair the damage.

Five days in jail was the sentence passed by Judge Leet, Montreal, in the case of Jules Gratton, accused of intimidating the workmen and preventing others from seeking employment during the progress of a strike by carpenters in the employ of P. Lyall & Sons. The Judge said it was clear that men had been prevented from going to work; but as the evidence against the defendant was not conclusive he gave him the benefit of the doubt. On the charge of intimidation and using threats to those who applied for positions there was strong evidence by the detectives, on which he found the defendant guilty. The maximum penalty was a fine of $100 or three months. The Judge continued: "It seems to me that in cases of this kind when the rights of others are interfered with that $100 is not enough. This is a small sum and as in the present case the union will pay at a cost of a few cents to the members, and nothing for the accused. As this is the first case I will not impose the fine but sentence the accused to five days in jail." The case has been appealed, and will be heard in the Court of King's Bench on September 11.

The Polson Iron Works will build a new steel dry dock and repair shop on Toronto Harbor. It is expected that the new dock will be ready for use early next spring. The dock will be built in three sections, which, when coupled, will be 600 feet long by 100 feet wide, and will when finished have a lifting capacity of 9,000 tons and will be able to handle the largest vessels now on Lake Ontario.

The equipment will be the latest up-to-date in everything. The pumps will be operated by electric power, and each of the three sections of the dock can be used as a separate dock. The two sections now being built will each accommodate steamers up to 175 feet. In cases where large boats are to be built, two sections will be joined together. New steel sheer-legs of 100 tons lifting capacity are to be installed.

The Polsons Company have decided to locate the dry dock at the foot of Frederick street, just west of the company's present plant. One hundred and thirty-six feet of land has been leased from the city, on which a basin will be blasted to the depth of [illegible] feet to accommodate the floating dock.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is nvited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Dauphin, Man.

Tenders called for waterworks and sewerage. Owner, Town of Dauphin, Man.; mayor, H. F. Caldwell; chairman, D. D. McDonald; secretary-treasurer, J. W. Johnson; engineers, Chipman & Power, Mail Bldg., Toronto. Constructing the following works: Contract I.—Dam and gate house in Riding Mountains, for waterworks reservoir. Contract P.—Substructure sewerage pumping station in Dauphin. Plans at Dauphin or at offices of the engineers, Toronto and Winnipeg. Tenders received by secretary-treasurer until 8 p.m., September 5th.

High River, Alta.

By-laws to be submitted for waterwrks and sewerage. Owner, town of High River; clerk, W. E. C. Holmes. Plans call for a steam pumping station and compressed air sewer ejector. Level too low to drain sewerage by gravity. By-law to be submitted on September 5th to raise $125,000, 40 years 5 per cent. debenture bonds.

High River, Alta.

Tenders to be invited for cement sidewalks. Owner, Corporation of High River; secretary-treasurer, Geo. E. Mack; 10,000 square feet cement sidewalks to be laid. Tenders for which will be called this month.

Kingston, Ont.

Dr. A. B. Williamson, M.H.O., states that the system of water supply is very unsatisfactory, and the municipality are contemplating the installation of a filtration plant.

Magrath, Alta.

The council intend to submit a bylaw to raise $11,000 for the laying of sidewalks.

Moorefield, Ont.

Tenders called for municipal drain No. 1. Owner, Tp. of Maryborough; township clerk, W. W. Scott, Moorefield; engineer, C. D. Bowman, West Montrose, Ont. Construction of drain, containing about 43,000 cubic yards of excavation. Plans, etc., at office of Tp. Clerk or at office of engineer. Tenders received until 2 p.m. September 4th by townsihp clerk. Advertisement in "Tenders and For Sale Department" of this issue.

Montreal, Que.

The city of Montreal, assisted by the Federal Government, will cover the section of the Little River St. Pierre running through the city limits, at an estimated cost of $150,000. The covering will be of concrete and may be constructed so as to make a driveway.

New Westminster, B.C.

Drainage system. Petition presented by property owners of Queensborough for drainage into river. A pump is among the requirements. Matter referred to city engineer for preparation of by-law.

Oshawa, Ont.

Equipment required for asphalt block pavement. Owner, Corporation of Oshawa; engineer, Frank Chappell, C.E. Required up-to-date street cleaning apparatus, sweepers, etc. Apparatus required October or thereabouts.

Ottawa, Ont.

Tenders called for waterworks supplies. City engineer, N. J. Ker, Ottawa. Tender for 30-in. c.i. pipe and thirty special castings. Specifications at office of city engineer. Tenders received by chairman, waterworks committee until August 29th.

Revelstoke, B.C.

The Corporation of Revelstoke will extend their waterworks one mile. Piping supplied by the Pacific Coast Pipe Co. Work being done by day labor. Engineer, J. B. Scott.

Roche Point, B.C.

Waterworks, Strathcona D. L. 543. Engineer, Mr. Cosgrove, North Vancouver. Preliminary plans for waterworks for eastern part of municipality have been prepared. Initial plans provided for supplying Red Fir Lum-Co. with water. Tenders will be called for installation of main a distance of 4,000 feet, which, although temporary, foreshadows a large scheme.

Tp. of Stamford, Ont.

Tenders to be called for cement sidewalks, $7,000. Clerk, C. Munroe, South End, Ont.; engineer, J. Gardiner, Niagara Falls, Ont. At the next meeting of township council tenders will be called for cement sidewalks. Estimated expenditure, $7,000.

Tp. of North Darchester.

Tenders called for drain, Lots 12, 13 and 14, etc. Clerk, W. B. Lane, London, Ont. Construction of drain. Plans, etc., at office of clerk. Tenders received by clerk until August 28th.

Toronto, Ont.

Tenders called for sewer. Owner, city of Toronto; city engineer, C. H. Rust. Construction of sewer on Curzon street from Myrtle avenue to 530 feet south. Spesifications, etc., at office of city engineer. Tenders received until noon August 29th.

Tenders called for laying water drain, Yonge to Broadview. Owner, City of Toronto, G. R. Geary, Chairman, Board of Control. Excavation, laying and jointing of 16-in. c.i. water main along Rosedale Valley Drive. Plans, etc., at office of city engineer. Tenders received by chairman until noon August 29th.

Tenders called for main drainage works. Owner, City of Toronto. G. R. Geary, Chairman Board of Control. Storm overflow sewers (Sorauren Div.) total length 8,897 lin. ft., including laying of 30 and 36-in. concrete pipe and supply and laying of 24-in. c.i. pipe and 15, 18 and 24-in. vitrified pipe; storm overflow sewers (Manchester Div.), 906 lin. ft. of 3-ft. 4-in. x 3-ft. 8-in. concrete culvert in open cut; high level interceptor (Sec. No. 14) 985 lin. ft. of 3-ft. x 4-ft. 6 in. egg shape, brick in tunnel. Plans, etc., at office of city engineer. Tenders received by Chairman, Board of Control, until noon September 12th. Advertisement in "Tenders and For Sale" department of this issue.

Tenders called for pavements and concrete walks. Owner, City of Toronto; G. R. Geary, Chairman Board of Control. Asphalt pavements on Delaware avenue, Edwin ave., and Edgewood Crescent; Saskville and Somerset ave.; bitulithic pavements on three streets; brick block pavements on Gerrard; concrete curbs on eight streets; concrete pavements on two streets; concrete walks on 26 streets. Specifications received by chairman until noon August 29th.

Tenders called for supply of pipe. Owner, Board of Control, Toronto; chairman, G. R. Geary, City Hall. Supply of 600 feet of 16-in. steel riveted or lap welded pipe and 420 feet 12-in. welded steel pipe. Tenders received by chairman board of control until September 5th.

Winnipeg, Man.

Tenders called for valves and hydrants. Owner, Board of Control, Winnipeg; secretary, M. Peterson. Supply of quantity of valves and hydrants for the domestic waterworks supply system. Specifications, etc., at office of city engineer, 223 James ave., Winnipeg. Tenders received by secretary board of control until 11 a.m., September 8th.

CONTRACTS AWARDED

Aylmer, Ont.

Pavement. Owner, Town of Aylmer, tp. clerk, D. C. Davis; town engineer, F. Wooster; contractor, Jos. L. Davis, $5,500, Aylmer. 2,400 square yards vitrified brick pavement. Tenders to include grading drains, gutters, etc. Work commences at once and to be finished not later than Oct. 14th.

Harriston, Ont.

Municipal drain, Tp. of Minto. Tp. Clerk, W. D. McLellan, Harriston, Ont. Contractor, Charles Martin, Harriston, $5,980. Construction of municipal drain.

Nanaimo, B.C.

Street paving; city engineer, A. Waters; contractor, El-Oso Co., Vancouver. Asphalt at $1.74 per yard, guaranteed five years. Approximate area, 14,450 superficial yards. City preparing subgrade.

St. Vital, Man.
Pavement. Owner, municipality of St. Vital; secretary, E. A. Poulasin; engineer, G. Mullen, 372 St. Jean Baptiste street, St. Boniface. Contractor, Bitulithic & Paving Co., 354 Main street, Winnipeg. St. Mary's road, 18 feet in width with one curb, approximate length one mile.

Toronto, Ont.
The contracts for the following valves have been awarded to the Canadian Fairbanks Co., Ltd.; 20-in. valves, $102,-61; 20-in. check valves, $137.81; 12-in. check valves, $45.24.

Grading, Sydenham, Ottawa Br. Owner, Canadian Northern Ontario Ry., Toronto; general contractor, J. P. Mullarky, Montreal; sub-contractors, Morin & Chisholm, Perth road, Ont. Two and a half miles, near Sydenham. R. A. Girouard, Smith's Falls, Ont., five miles.

Vancouver, B.C.
Water mains, D. L. 139 and 540. Owner, City of Vancouver; city clerk, W. McQueen; engineers, Cleveland & Cameron, Winch Bldg., Vancouver. Contractors, Municipal Construction Co., 319 Pender street west, Vancouver, $515,000. Work will begin at once.

Burnaby, B.C.
Tenders called for bridges and grading, Johnston road; municipal clerk, Wm. Griffiths. Three timber bridges. Grading involves removal of about 22,-000 cubic yards of earth. Tenders received until August 28th.

Railroads, Bridges and Wharves

Brantford, Ont.
Tenders called for bridge. Owner, Board of Works, Brantford, Ont.; chairman, Chas. Hartman; city engineer, T. Harry Jones. Construction of a steel highway bridge, length of span, 65 feet; width, 16 feet. Plans, etc., at office of engineer. Tenders received by Chairman, Board of Works, until August 30.

Chatham, Ont.
Tenders called for five bridges. Owner, Tp. of Chatham; A. J. Templeton, Commissioner. Construction of five wood and steel bridges to be built over the Maxwell Outlet Dredge Cut in the Tp. of Chatham and Dover. Plans at the Tp. of Chatham office, Scane Block, King street, Chatham, and at the clerk's office, Tupperville. Accepted cheque for $100 to accompany each tender. Tenders received at Township of Chatham office until 2 p.m. September 2nd.

Kingston, Ont.
The reports presented at the annual meeting of the shareholders of the Kingston & Pembroke Railway Company were considered very satisfactory. Extension improvements have been made during the year and further work will be done this year

Lloydtown, Ont.
Tenders called for bridge. Owner, Tp. of King; clerk, J. O. Jenkins, King P.O.; engineers, Barber & Young, 57 Adelaide street east, Toronto. Concrete arch. Tenders were called until August 25th

London, Ont.
Work in progress for railroad facilities. Owner, Canadian Pacific Railway Co., Montreal; contractors, Coal chutes, Jno. Hayman, London; work on substructure has commenced. Steel (bridge on Thames), Dominion Bridge Co., Walkerville. Work has commenced. Contracts will be let shortly for new all-steel water tank, 1-sty. sand house, concrete ash pits and extensions to the yards to cost about $65,000.

Montreal, Que.
Work in progress for railroad. Owner, Canadian Pacific Railway, Montreal; St. Therese to Quebec Jct., 11 miles. Contractors, Nova Scotia Construction Co., St. Timothee, Que.

Three Rivers, Que.
Siding construction, 5 or 6 miles; contractors, Macdonald & Dibbles, Three Rivers, Que.

Ottawa, Ont.
Entrance approved for railroad. Board of Control decides in favor of railway entrance for C. P. R. and C. N. R. on west side of Rideau Canal, with tunnel for C. P. R. under city. Government will be approached at once regarding the narrowing of canal. C. P. R. expect this means early starting of the tunnel through rock to cost $1,250,000.

Tenders called for improvement to canal. Owner, Department of Railways & Canals, Ottawa; secretary, L. K. Jones. Improvement to St. Peter's Canal. Plans, etc., at office of department, at offices of resident engineers at Cornwall, St. Peters, C.B. Tenders received by secretary until 6 o'clock September 12th. Advertisement in "Tenders and For Sale" department of this issue.

Portage la Prairie, Man.
Proposed enlargement of freight shed. Owner, Canadian Northern Railroad. Divisional superintendent, A. E. Warren. Addition likely about 50 or 60 ft. and will include new offices. Work will commence at once. A station is also proposed for Delta Beach next year

Stratford, Ont.
Tenders called for concrete arch. Owner, City of Brantford; city engineer, M. Ferguson. Construction of concrete arch on Lorne ave. Plans, etc., at office of city engineer. Tenders received by engineer until 5 p.m. September 2nd.

Ste. Rose, Que.
Tenders called for aqueduct. Owner, Village of Ste. Rose; sec.-treas., J. E. David; engineers, Ouimet & Lesage, 15 St. Lawrence Blvd., Montreal. Construction of aqueduct. Plans, etc., at office of engineers. Tenders received by sec.-treas., until September 15th.

Tp. of Amaranth, Ont.
The by-law to raise $3,500 for bridges was carried.

Wheatley, Ont.
Tenders called for landing piers. Owner, Department of Public Works, Ottawa; secretary, D. C. Desrochers. Construction of a landing pier at Wheatley, Kent Co. W., Ont. Plans, etc., at the department and at the offices of J. G. Sing, district engineer, Confederation Life Bldg., Toronto.; H. G. Lamb, district engineer, London, and on application to the postmaster at Wheatley. Tenders to be accompanied by accepted cheque for ten per cent. of amount of tender. Tenders received by secretary until 4 p.m. September 13.

Walkerton, Ont.
New tenders to be called for bridge. (Over Saugeen River). County engineer, Jas. Warren. Two spans 125 ft. each and one span 90 feet; also two concrete abutments and two piers for same bridge. Tenders called for August 5th were not opened. New tenders called later on.

CONTRACTS AWARDED

Arthur, Ont.
Three bridges. Engineers, Bowman & Connor, 36 Toronto street, Toronto. Successful tenderers, John Drurie, Arthur, Ont, 20 feet beam bridge; J. D. Callahan, Arthur, Ont., 30 feet girder bridge; Jno. Langdon, Kennilworth, 26 ft. arch bridge.

Brooklyn, Shelburne Co., N.S.
Breakwater. Successful contractors, The Nova Scotia Construction Company, Sydney, N.S., at about $180,000. This company have the contract for all future construction work on the Dominion Steel Company's plant at Sydney, also contract for the construction of a branch line for C.P.R. in Quebec.

Guelph, Ont.
Bridge. Owner, City of Guelph, T. J. Moore, clerk; acting city engineer, L. Malcolm. Contractors, Rutherford & Patten, St. Catharines, Ont., $7,250. Construction of concrete arch bridge and viaduct. Approximate amount of concrete, 572 cubic yards. Two others tendered at $10,080 and $9,975.

Kamloops, B.C.
Railway, Kamloops to Yellow Head Pass. Owner, Canadian Northern Railway; general contractors, the Northern Construction Co., 406 Union Bank Bldg., Winnipeg, and the Cowan Construction Co., Scott Bldg., Winnipeg. Sub-contracts are to be awarded at once. Manager of Northern Construction Company, Vancouver, J. M. Mercer.

Montreal, Que.
Terminal facilities, Western junction. Owner, Canadian Pacific Railway; general contractor, C. E. Deaken, 11 St. Sacrament street, Montreal. Buildings about to be erected—24-stall engine house; a machine shop; a mechanical coaling plant; a store building; a boarding house to lodge 100 men; capacity of yards increased to 1,700 cars. Work to be finished this year.

Oakville, Ont.
Bridge, over 16-mile Creek. Owner, County of Halton; Wm. Panton, clerk, Molton, Ont; engineer, J. Hutcheon, Guelph; contractor, Rutherford & Parron, St. Catharines, $22,744. Concrete, one span, width 18 feet.

Toronto, Ont.
Cleaning and painting bridges. Owner, City of Toronto. President of Board of Control, F. S. Spence; successful contractor, Canadian Sand Blast Co., 106 Eastern Township Bank Bldg., Montreal, $4,500.

Three bridges, Dundast street, Moore Park and Sherbourne street.

Bridge, across Don River near Russell Hill. Owner, County of York; engineer, Barber & Young, Adelaide street, Toronto; contractor, E. H. Beck, 15 Toronto street, Toronto. Concrete birdge, 60 ft. arch.

Vancouver, B.C.
Wharf and freight shed, False Creek property. Owner, the Great Northern Railway, general manager, M. T. Costello; general contractor, W. H. Chase, [illegible] Broadway W. Wharf, 800 x 148, freight shed, 1,008 wide. About 160,000 lin. ft. of piling will be needed. Dominion Creosoting Co., Ltd., will furnish about [illegible],000 creosoted piles as well as bracing. Other contracts to be awarded shortly.

Public Buildings, Churches, Schools, etc.

Granby, Que.
Contemplated, school, $60,000. Owner, Catholic School Commissioners, architect, Mr. Dalbe Viau, 76 St. Gabriel street, Montreal. Plans are being prepared for a school. Tenders will be called in about two weeks by the architect.

Gleneden, B.C.
Tenders called for school. Owner, Department of Public Works, Victoria. Public Works Engineer, J. E. Griffith, Victoria. One-room and sub-basement. Plans, etc., at office of M. MacKay, secretary school board, Salmon Arm, B.C., and at above department. Tenders received by engineer until September 1st.

Gravenhurst, Ont.
Tenders called for church. Owner, Presbyterian Church of Canada. Chairman building committee, W. J. White, Gravenhurst; architect, C. J. Gibson, 75 Yonge street Toronto. For the different trades in the erection of a church. Plans, etc., at office of J. A. Cockburn, Gravenhurst. Tenders received by architect until September 1st.

Hog Island, Ont.
Tenders are called until September 20 by A. Johnston, Deputy Minister of Marine & Fisheries, Ottawa, for construction of modern lighthouse tower, plans, etc., at Department, Ottawa, and at the Post Office, Chippewa, Niagara-on-the-Lake, Clinton, Dalhousie, Port Colborne and Niagara Falls.

Hope, B.C.
Tenders called for school. Owner, Department of Public Works, Victoria, B.C.; public works engineer, J. E. Griffith. Erection of a large one room frame schoolhouse with sub-basement at Hope, B.C. in the Yale Electroal District. Plans, etc., at the offices of the Government agent, Ashcroft, B.C., and at the department, Victoria. Tenders to be accompanied by accepted cheque for $300. Tenders received by Minister of Public Works until noon September 5th.

Kildonan, Man.
A by-law to issue $13,000 school debentures has been passed by the ratepayers.

Kingsville, Ont.
Plans being prepared for library, $7,000. Owner, Kingsville Library Board; architect, W. A. Mahoney, Guelph, Ont. Two stys., 36 x 36, cement foundation, brick, cement work, cut stone, concrete block, artificial stone, slate roof, metal ceiling, roofing and siding, sheet metal work, steel beams, plate glass, art glass, electric work, pipe covering. Tenders called about September 15th.

Lake St. Louis, Que.
Contemplated, club house. Owner, the Country Club, care general delivery, local post office; architect, not chosen. Plans being considered. No details for a month yet.

Lunenburg, N.S.
Tenders called for post office fittings. Owner, Department of Public Works, Ottawa; secretary, R. C. Desrochers. Interior fittings. Plans, etc., on application to Mr. N. Myra, caretaker, public bldg., Lunenburg, and at the department. Tenders received by secretary until September 5th.

MacLeod, Alta.
The town of MacLeod is contemplating the erection of a new skating rink. A meeting will be called shortly to see what arrangements can be made.

Moore Park, Man.
Tenders called for school. Owner, Public School Board; secretary, E. Dearing; architect, W. W. Blair, Nanton Bldg., Main & Portage ave., Winnipeg. Two-roomed, brick veneer, full cement basement. Plans at office of architect and with Mr. Maybee, manager, Bank of Commerce, Brandon, and with secretary. Tenders received by secretary until September 1st. Brick and cement to be completed by November 10. Plastering by December 20.

Montreal, Que.
Plans accepted for fire and police station, $60,000, Marechal street and St. Antoine road. Owner, Corporation of Montreal; architect, Thos. Daoust, 90 St. James street. Terra cotta, steel, pressed brick, cut stone. Tenders will be called for in a week or more.

Fire station, Mansfield street; City of Montreal, City Hall. Plans to build a new modern fire station with electric fixtures and apparatus.

Work in progress for school, $60,000, St. Joseph Blvd. Owner, Catholic School Commissioners, 1937 St. Dominique street, Montreal; architect, Dalbe Viau, 76 St. Gabriel street, Montreal; contractors, T. Lessard, 210 Park ave., brick; Bouchard & Guilbault, 112 Laurier ave., stone; Henry Forque, 25 Irene street, carpentry; Goudrean Bros. & Co., 264 Visitation street, cement; J. A. Lacombe, plastering; Cadieux & Briard, 1277 St. Dominique, steam heating and ventilating; H. Turcot, 1556 St. Lawrence Blvd., plumbing; F. X. Lavelle, 241 Clarke street, painting; Structural Steel Co., Ltd., Longue Pointe, iron work.

New Westminster, B.C.
Tenders called for isolation hospital. City clerk, W. A. Duncan. Erection of an isolation hospital on the Reserve, between 8th and 10th streets, above 8th ave. Plans, etc., at office of city engineer. Tenders to be accompanied by accepted cheque for five per cent. of amount of tender. Tenders received by clerk until 5 p.m. August 28th, 1911.

Ottawa, Ont.
Plans being prepared for church, $35,000. Owner, Roman Catholic Church; architect, A. LeB Weeks, Canada Life Bldg., Ottawa. Brick, seating capacity 750.

Saskatoon, Sask.
The United Norwegian Lutheran Church have under consideration the erection of a college here in affiliation with the university of which Prof. W. Murray is president; Rev. T. H. Dahl, D.D., Minneapolis, Minn., president

St. John, N.B.
Site chosen for post office, Prince William street. Owner, Department of Public Works, Ottawa; secretary, R. C. Desrochers. The new post office will be similar to the one in Winnipeg and is estimated to cost $240,000.

Swift Current, Sask.
Theatre, $30,000. Architect, Sharon & Darrach, Regina and Swift Current, are preparing plans for erection of a new brick and steel theatre, 50 x 125, with seating capacity of 900.

Vancouver, B.C.
Plans being prepared for church, Carl and Pender streets. Owner, St. James Congregation; architects, Alexander & Brown, 445 Granville street, Vancouver. When plans are completed it is expected work will start at once.

Winnipeg, Man.
Tenders called for driving shed and fumigating room. Owner, City Tubercular Hospital; secretary, Board of Control, M. Peterson. Supply of labor and materials. Plans, etc., at office of Inspector of Buildings, 223 James avenue. Tenders received until 11 a.m. August 28th, by chairman, Board of Control.

Winnipeg, Man.
Plans being prepared for isolation hospital. Architect, H. B. Rugh, 927 Union Bank, Winnipeg. Tenders are expected to be called within one month.

CONTRACTS AWARDED

Gasperian, N.S.
Church, $8,500. Owner, Baptist Church, Gasperian. General contractor, J. H. Hicks, Bridgetown, N.S., wood construction, stone and brick foundation, hot air heating, wood roofing.

Hamilton, Ont.
School, $87,500, Trolley street. Owner, Board of Education, Hamilton; secretary, R. H. Foster; architect, Stewart & Witton, Hamilton & Provincial Loan Bldg., Hamilton. General contractor, W. H. Yates, Jr., 24 Leeming street, Hamilton. Two sty., 65 x 120, brick construction, stone foundation, cement work, cut stone, marble, tile, mantels, fireproofing, metallic lath, metal ceiling, cornice, fireproof doors and windows, steel beams, iron columns, plate glass.

Montreal, Que.
School, $36,000. Owner, Catholic School Commissioners, St. Laurent, Quebec; architect, Dalbe Viau, 76 St. Gabriel street, Montreal; general contractor, Jas. Dorais, St. Laurent, Que. Three stys., brick and stone, stone foundation, hot water heating, concrete basement, 1st floor stone, 2nd and 3rd stys. brick. Sub-contracts not yet awarded.

Ottawa, Ont.
Experimental farm building. Owner, Department of Public Works, Ottawa. Secretary, R. C. Desrochers, Ottawa; contractors, S. A. Matte, Ottawa, $6,500. Construction of Tobacco Curing Barn.

Toronto, Ont.
Club house, $25,000. Owner, Knights of Columbus, Toronto; architect, C. J. Reid, Confederation Life Bldg., Toronto. General contractor, M. Healey, 183 St.

George street, Toronto. Three stys., brick and stone, 100 ft. x 75 ft., brick foundation, steam heating, combination lighting, felt and gravel roofing, reinforced concrete.

Victoria, B.C.

Building. Owner, Union Club, Victoria; architect, L. R. Rixford, Victoria. Contractors, Sound Contractor & Engineering Co., Seattle, Wash. Four stys., 85 x 85, brick and terra cotta, reinforced concrete, interior finish mahogany, mantels.

Vancouver, B.C.

Church, $72,000, Thurlow and Pendrill streets. Owner, First Congregation Church; pastor, Rev. J. K. Unsworth; architect, Sharpe & Thompson, 536 Hastings street west, Vancouver; superintendent of construction, Wm. Neve, 1090 Thurlow street, Vancouver; contractor, Adams Construction Co., 44 Seymour street, $23,000. Plumbing will be done by Johnston-Thompson Co., 525 Burrard street. Plastering, sheet metal work, electric wiring, painting, not let yet.

Wing, general hospital, 10th to 12th streets. Owner, General Hospital Bldg. Geo. Haddon, secretary, Vancouver; architect, Grant & Henderson, Williams Bldg., Vancouver; general contractor, McDonald & Wilson, Howe & Robson streets; heating contractor, Leek & Co., 1098 Homer st., Vancouver, over $15,000. Three sty. and basement, stone and concrete wing.

Wetaskiwin, Alta.

The contracts for the $12,000 Roman Catholic Church on Lansdowne street have been awarded as follows: General contractor, S. Reist; masonry and cement, Scott Bros.; heating, City Plumbing Co.; stone work, Scott Bros., all of Wetaskiwin.

Residences

Brantford, Ont.

Residence, $3,000. Egerton street. Owner, Mrs. Thos. Elliott, 80 Brant ave., Brantford; architect, L. D. Barber, Brantford. 2-sty., 28 x 32, brick, concrete foundation, hot air heating, electric lighting, roofing, shingles on 14-lb. asbestos, interior finish pine, cement work, brick, telephone system, electric bells. Tenders received until September 2nd. This building on same lot, but detached from that reported in No. 1476.

Hamilton, Ont.

Buildings contemplated or in progress: Thos. Hamilton, owner and contractor, 173 Niagara street, brick dwelling, Wentworth street, $1,500; M. Swales, 214 East ave. north, two brick dwellings, Wallace street, for Industrial Park Survey, $1,600; S. Bowman, owner and contractor, Stoney Creek, cement block dwelling, Balsam ave., $1,700; A. Rowbotham, contractor, 33 Fraser ave., two frame dwellings, Campbell ave., for R. F. Saudy, of the Bank of Hamilton Bldg., $1,800; F. M. Reed, owner and contractor, 50 West ave., brick dwelling, Hunter street, $2,000.

Malvern Square, N.S.

Contemplated, residence, $3,000; W. M. Smith, Melvern Square, N.S. Two stys., wood construction, cement foundation, hot air heating, acetylene gas, wood roof. Work will probably commence in the fall and be completed in spring. No tenders likely to be called.

Montreal, Que.

Tenders received for residence, Westmount ave. Owner, Ben. Tooke, 65 Linton Apartments; architect, MacVicar & Heriot, 104 Union ave., Montreal. 3 stys., 45 x 65, brick and stone, concrete foundation, hot water heating, electric light, oak interior finish, tile bath.

Specifications prepared for residence, $6,500, Messier street. Owner, Toussaint Milot, 1400 Messier street, Montreal; general contractor, T. Belheumeur, 1400 Messier street, Montreal. Three stys., 50 x 40, cement, stucco, gravel roofing.

Specifications prepared for residence, $4,000, Tenth ave., Rosemount. Owner, P. Gagnon, 339 Sixth ave., Montreal; architect, Z. Trudel, 238 St. Andre street, Montreal. Two sty., 50 x 40, wood and brick. Owner is supervising construction.

Work in progress for residence. Owner, C. I. DeSola, 71 McGill ave., Montreal; architect, Messrs. Saxe & Archibald, 59 Beaver Hall Hill, Montreal; carpentry contractor, Laird Paton & Son, Ltd., 485 St. James street, Montreal. There are still several contracts to be awarded.

Specifications prepared for residence, $8,000, Gray ave. Owner, Helen Knowles, 473 Guy st., Montreal; architect, J. W. McGregor, 5 Beaver Hall Square, Montreal; general contractor, F. Barrette, 342 Wolfe street, Montreal. Two sty., 48 x 50, brick front, slate and gravel roofing, galvanized iron, cornice.

Ottawa, Ont.

Buildings contemplatetd or in progress in Ottawa: A. Pelton, brick dwelling, Jos. Meagher, builder, $2,100; Jacob Polowin, brick dwelling, Bell st., $2,500; A. Carpentier, brick veneer dwelling, Main street, $2,050; E. M. Barrett, dwelling, Carling avenue, C. P. Meredith, architect, $4,700; G. L. & M. Orme, factory for Rolla Crain Company, J. A. Ewart, architect, Spruce street, $19,775; Adam Ballantyne, solid brick stable, Echo drive, $1,500; Miss Victoria Bigras, dwelling, St. Patrick st., J. & C. Lowe, builders, $3,000.

Ottawa, Ont.

Tenders to be called for residence, $13,000. (Rockliffe). Owner, T. C. Keefer, Jr., Rockliffe. Architect, Allan Keefer, Free Press Bldg., Ottawa. 30 x60, stone and brick, stone foundation, hot water heating, electric light, shingle roof. Tenders called shortly.

Plans being prepared for alterations to residence, Daly ave., Ottawa. Architect, Allan Keefer, Free Press Bldg., Ottawa

Residence. Owner, Allan Keefer, Free Press Bldg., Ottawa (private plans). Limestone brick, stone foundation, hot water heating, electric lighting, tile roofing, interior finish hardwood, marble, brick, tile, mantels, electrical work, electric bells. Work will be done by day labor.

Specifications prepared for garage and two cottages. Owner, W. C. Edwards, Sussex street, Ottawa. Architect, Allan Keefer, Free Press Bldg., Ottawa. Stucco construction, metallic lath, shingle roofing. Work will be done by day labor.

Ottawa, Ont.

Specifications being prepared for residence, $12,000, Rockliffe. Owner, Mrs. McConnell; architect, Allan Keefer, Free Press Bldg., Ottawa. Brick, stone foundation, hot water heating, electric light, shingle roof, tile, mantels, fireproofing, weather strips, electric work, electric bells ,shingle stain. Date for calling tenders not decided yet.

Prince Rupert, B.C.

Residence, $3,000. Owner, F. S. Clements, Third ave., Prince Rupert; architect, W. L. Barker, Third ave., Prince Rupert. One sty., 25 x 40, frame and shingle construction, hot water heating, electric lighting, shingle roofing, tile, mantels, fireproofing, metallic lath, asbestos materials, electrical work, electric bells, shingle stain, ornamental columns or caps, art glass, marble finish, hard plaster on metallic lath.

St. David's, Ont.

Work in progress for residence. Architect, Jas. Calvert, Queenston, Ont. Two and a half stys., 40 x 40, frame, Excavation has commenced. Work will be done by day labor.

Toronto, Ont.

Work in progress for pair dwellings, $6,000, 123-5 Concord ave. Owner, Mr. Walkie, 326 Shaw street, Toronto; architect, H. C. Roberts, 16 Foxley street, Toronto; general contractors, Robert Bros., 16 Foxley street, Toronto. Two and one-half stys., 32 x 22, brick and stone, stone foundation, hot air heating, electric light, shingle, felt and gravel roofing, plate glass, tile, mantels. Footings being laid.

Tenders to be called for additions to residence and garage, 126 Spadina road. Architect, S. B. Coon, 1106 Temple Bldg., Toronto. Two sty., stone and brick, stone foundation, hot water heating, electric lighting, shingle roofing, interior finish hardwood floors, cement work, cut stone, brick, mantels, plate glass and art glass. Tenders received after August 22, close 29th.

Tenders called for three dwellings, $5,000, west side Empire avenue. Owner, E. J. Croker, 154 Booth ave., Toronto. Two stys., 35 x 36, brick, brick foundation, hot air heating, electric lighting, shingle roofing. Tenders will be received for next ten days for brick and carpentry work. Other trades will be done by day labor.

Tenders to be called for three pair of dwellings, $18,000, west side Sunnyside avenue. Owner, A. Grassi, 288 Bathurst street, Toronto; architect, J. M. Cowan, 65 Adelaide street east, Toronto. Two and one-half stys., 34 x 44, brick, stone foundation, hot air heating, electric light, slate roofing. Tenders received after August 26th, close September 2nd

Residence, $3,500, west side Glendale ave. Owner, Mrs. M. A. Patterson, 180 Euclid avenue, Toronto. Two and one-half stys., 25 ft. 8 in. x 35 ft. 3 in., concrete block construction, concrete block foundation, hot water heating, combination lighting, open plumbing, slate, felt and gravel roofing, interior finish pine and hardwood, cement work, tile, mantels, pipe covering, electrical work, electric bells, shingle stain, plate glass. Work will be done by day labor.

T. J. Brown, 817 Dundas street, will [illegible]

[illegible] ave., 2 sty., brick, stone foundation, felt and gravel roofing, $7,500

Jas. Bodie, 159 Victor ave., will erect a pair of dwellings on Pape ave., 2½-stys., 44 ft. 6 in. x 29 ft., brick, brick foundation, shingle roofing.

L. K. Tallis, 477 Parliament street, will erect a dwelling, 2½-stys., 30 x 20, brick, brick foundation, slate roofing, $4,000

Jas. Brury, 152 Davenport road, will erect a pair of dwellings on the south side of Davenport road, 2½-stys., 32 ft. 10 in. x 46 ft., brick, brick foundation, shingle, felt and gravel roofing.

Two pair residences, $6,500, east side Empire ave. Owners, A. Jeffrey, 55 Laing street; architect, H. Hollingsworth, 146 Beech ave. Two stys., 22 x 39, roughcast, brick front, hot air heating, electric lighting, felt and gravel roof. Work will be done by day labor.

Tenders to be called for four pair dwellings, $9,600, Pauline ave. Owner, B. J. Case, 189 Western ave., Toronto. Two and one-half stys., 40 x 35, brick and stone foundation, hot air heating, shingle, felt and gravel roofing. Tenders to be called in about three weeks.

Tenders called for apartment house, $22,000, Spadina ave., between Dupont and Bernard; architect, D. E. Smith, 75 Victoria street, Toronto. Two stys. and basement, 78 x 112, brick and stucco, brick foundation, steam heating, electric lighting, shingle roofing, cement work, marble, brick, tile, mantels, freight elevator, pipe covering, electrical work, telephone system, shingle stain, roofing sheathing and deafening paper, steel beams, plate and art glass, refrigerator, electric fixtures, gas stoves. Brick and carpenter work being done by owner. Heating and plumbing tenders closed August 28.

Vancouver, B.C.

Plans changed for apartment house. Owner, Mrs. M. S. McDonald, Collingwood, B.C.; architects, Jones & Aspell, 347 Pender street west, Vancouver. Plans to be changed to admit of the building being increased in size. The architects have completed plans for a residence for Mr. Bridge, to be built on Shaughnessy Heights. Tenders for this will be called shortly.

Contemplated, apartment house. Architects, Stuart & White, 919 Metropolitan Bldg., Vancouver, are preparing plans for three apartment houses, five stys., cost $45,000; 3 stys., $30,000; details on third not definitely settled, estimated cost $100,000.

Plans being prepared for residence, Shaughnessy Heights. Architect, Bamforth & Beattie, 404 Homer street, Vancouver. Two stys., hardwood flooring, hot water heating, plumbing and electric wiring. Plans awaiting approval of owner.

Plans prepared for residence, $11,000, Shaughnessy Heights. Owner, Dr. W. S. Dalby, 510 Granville street. Two sty. and basement, 46 x 36, granite, interior, hardwood, hot water heating, electric wiring.

CONTRACTS AWARDED

Digby, N.S.

Residence. Owner, Mrs. Louis Morse, Digby; architect, Leslie R. Fairn, Aylesford; general contractor, J. F. Bent, Middleton, N.S. Wood construction, stone and concrete foundation, wood roofing. Contract awarded August 17th.

Hamilton, Ont.

The contracts for the $3,000 residence being erected on Westmoreland ave. by W. G. Patrick, 127 Wentworth street, have been awarded as follows: Masonry, Yates & Randall, 68 Wentworth N.; heating, Burrow Stewart & Milne Co., Cannon st. E.; plumbing, G. Pyle, 374 Barton street.

Maisonneuve, Que.

P. J. Guay, 93 Third ave., has awarded the contract for three flats, $10,000, to be erected on Adam and Fourth ave., to F. Metoche, 122 Fourth ave., 3-sty., 23 x 90, stone and wood.

Residence Christophe Colomb. Owner, W. Lacroix, 235 First ave., Maisonneuve; general contractor, J. B. Maleport, 229 First ave. Three sty., 25 x 40, wood and stone, flat roof, concrete foundation, $4,000.

Residence, Beaulieu. Owner, J. Lacasse, 191 Beaulieu, Montreal; general contractor, H. Boisjoli, 137 Davidson street, Montreal. Two sty., 26 x 42, brick and wood, flat gravel roof, concrete foundation, $2,000.

The contract for a $6,800 residence at 363 St. Catharine street west, being erected by John Robertson, has been awarded to Simpson & Peel, 10 Benoit street, 2½-sty., 25 x 120, brick construction. Hutchison Wood & Miller, 53 Royal Insurance Building, Montreal, architects.

Toronto, Ont.

Residence, 23 Central ave., $3,500. Owner, Geo. Stirrett, 17 Central ave., Toronto; general contractor, Wm. Clark, Indian road, Toronto. Two and one-half sty., 32 x 20 ft. 6 in., brick stone foundation, hot air heating, electric lighting, shingle roofing, interior finish, red oak flooring, cement work, cut stone, tile, mantels, electrical work, plate glass.

Business Buildings and Industrial Plants

Brandon, Man.

The Independent Harvester Co., of Plano, Ill., are about to open up a factory for the manufacture of their machines.

Plans in progress for warehouse. Owners, Geo. White & Sons, London, Ont., and Brandon; architect, W. A. Elliott, Brandon. Two sty., 200 x 60. Company will use Brandon as point of assembling and distribution for West.

Burnaby, B.C.

Contemplated, foundry. Owner, Canadian Sumner Iron Works, 744 Hastings west, Vancouver, B.C.; head offices, Everett, Washington. This company will erect a small foundry and iron works here, the first unit of a large plant.

Brantford, Ont.

Sale of property for business block, Dalhousie street. Owner, City of Brantford. Tenders received by chairman buildings and grounds committee, City Hall, for purchase of Waterous property, frontage 176 feet, until August 30th. Purchaser to covenant to erect modern 3-sty. buildings, property now vacant land.

Chippewa, Ont.

Equipment required for factory extension. Owner, the Norton Co., Chippewa. Motor shafting, electric furnaces, crushing machinery, etc. Contract for factory extension has been let to Braas Bros., Niagara Falls, N.Y., reinforced concrete, $28,000.

Florenceville, N.B.

Plans being prepared for bank building. Owner, Bank of New Brunswick, St. John, N.B.; general manager, R. B. Kessen; architect, F. Neil Brodie, St. John, N.B., 32 x 48.

Hamilton, Ont.

Plans to be prepared for factory. Owner, Hamilton Bridge Works; architects, Prack & Perrine, Sherman ave. north. Plans are being prepared for large buildings to cost between $150,000 to $200,000.

Kenora, Man.

Iron smelter, near Keewatin Power Company's dam. Parties interested, D. L. Mather, Winnipeg; Cawthra Mulock, Toronto. Advising engineer, Reese Engineering Co., 158 Portage ave. east, Winnipeg; local representative, Thos. Walsh, Kenora, 40,000 h.p. available at the dam will be utilized.

London, Ont.

Work in progress for business buildings. The Molsons Bank will erect a new brick and stone branch on the Market Square, costing $6,000. John Hayman, builder. The London & Lake Erie Railway & Transportation Company are building a new $4,000 brick station on Horton street. J. Purdon, builder.

Montreal, Que.

Tenders received for factory, St. Urban and Lagauchetiere streets. Owner, W. V. Dawson & Co., manufacturing stationers, 16 DeBresoles street, Montreal; architects, MacVicar & Heriot, 104 Union ave., Montreal. Four sty. and basement, 100 x 130, brick and mill, concrete foundation, gravel roof.

Work in progress for garage, University street. Owner, The Comet Motor Co., Ltd., University ave.; architects, MacVicar & Heriot, 104 Union avenue, Montreal. Two sty., 88 x 88, brick and reinforced concrete. Excavation started. Plans may be changed to a four or six sty. building. Building to be completed in three months.

Contemplated, garage, $25,000, Amherst street near Craig street. Owner, Harry Wever; architects, Finley & Spence, 46 Beaver Hall Hill, Montreal. Three sty. fireproof construction with LaPrairie brick and stone trimmings. Contracts will be awarded in a few days.

Permit applied for storage, $80,000, Notre Dame street. Owner, Harbor Commissioners, Common street; architect, Marchand & Haskell, 164 St. James street, Montreal. Reinforced concrete, concrete foundation. Also blacksmith shop and offices.

The firm of Commercial Cars Limited, of Luton, Bedfordshire, Eng., manufacturers of auto trucks, etc., are securing option on land for a large factory.

Specifications prepared for brass factory. Owner, C. O. Clark Bros., St. Patrick street, Montreal; architect, Ross and McFarlane, 1 Belmont street, Montreal; general contractor, Shearer, Brown & Wills, Ltd., St. Patrick street, Montreal. Two sty., 42 x 48, plastic brick, flat roof, tar and gravel, hot water heating.

Work in progress for clothing factory extension, $30,000, Elmire street. Owner, Campbell Mfg. Co., Ltd., Elmire st., Montreal; architect, Jos. Perrault, 2106 Park ave., Montreal; general contractor, Shearer, Brown & Wills, Ltd., 225 St. Patrick street, Montreal. Pile driving is being done by J. H. Wood & Son, 27 Edward street, Montreal. Four sty., 50 x 46, plastic brick, foundation on piles, gravel roofing, steam heating, sprinkler system of fire protection. Other sub-contracts not yet awarded.

Penticton, B.C.

Work in progress for hotel, $35,000; architect, A. F. Pelton, Penticton, 145 x 110, 60 bed rooms, first floor, concrete with half timber finish. Plans being prepared for superstructure. Work in foundation has started.

St. John, N.B.

John Reid, representing Campbell, Laird Company, shipbuilders, of Berkenhead and Sheffield, England, was here last week and states that they are contemplating the establishment of a plant in St. John.

J. C. Dalzell, who conducted a manufacturing establishment at Moncton for making spring mattresses and lounges, has removed his plant to St. John. He intends opening a larger and better squipped factory here.

Stratford, Ont.

Site purchased for factory. Owner, the MacDonald Thresher Co., Ltd.; manager, J. R. MacDonald, President Board of Trade. The enlargement of the factory is under consideration.

St. Catharines, Ont.

Tenders called for two buildings. Owner, Canadian Yale & Towne, Ltd.; architect, E. D. Pitt, 405 Victoria ave., Niagara Falls, Ont. Brick, concrete, steel and timber, with sprinkler squipment, area of floor, about 75,000 square feet. Tenders called until August 31st.

Truro, N.S.

The Truro Foundry Co. are contemplating the erection of a new machine shop at once on the site now occupied by the moulding shop on Yonge street. Building to be 120 feet by 80 feet.

Toronto, Ont.

Contemplated, offices. Owner, Toronto Stock Exchange, 20 King street east, Toronto; secretary, E. B. Freeland. Owners have authorized the purchase of site and intend erecting offices and stock exchange rooms. No plans have been considered yet.

Tenders called for addition to bakery, Bloor street west. Owner, Canada Bread Co., Toronto; architect, C. J. Gibson, 75 Yonge street, Toronto. 188 x 148, brick foundation, felt and gravel roofing, interior finish Georgia pine, skylights. Tenders were received until August 28th.

Victoria, B.C.

Frances S. Swales, architect, from London, Eng., is here for the purpose of drawing plans for the proposed addition to the Empress Hotel.

Vancouver, B.C.

Contemplated, addition to building, Hastings west and Homer streets. S. Jones ,proprietor Dominion Hotel, Victoria. Plans to build a six-sty. addition on site at present occupied by McMillan Jewelry Co., extension to be used as offices. Work is expected to begin in January.

Plans prepared for garage, $6,000, Georgia street. Owner, Archibald Auto Co. (M. B. Archibald); architect, G. P. Bowie, 570 Granville street, Vancouver. 40 x 66, concrete floor and foundation, cement entrances, sheet metal doors, steel trusses and supports and 1-in. corrugated iron walls supported by steel frame fireproof glass in skylights. Gas tanks will be installed.

Welland, Ont.

Business buildings. A. J. J. Brennan has under consideration the erection of a 3-sty. business block next spring, on East Main street. H. A. Rose is considering the erection of a new 3-sty. brick block on East Main street early next spring.

Weymouth, N.S.

Contemplated, sawmill. The Campbell Lumber Co., Weymouth, N.S., plan to erect a sawmill, brick and cement, with metal roof, this fall or next spring. About 500,000 bricks will be required.

Winnipeg, Man.

It is reported here that Irish linen manufacturers have decided to establish three factories in Western Canada. Two places have already been named, one in Moose Jaw and one in Winnipeg, the other has not yet been decided on, but will be somewhere in Alberta.

Tenders called for Business building. Owner, Free Press Co. (Printing and Publishing). Architects, Woodman & Carey, Free Press Bldg., Winnipeg. Tenders received by architect until August 26th.

CONTRACTS AWARDED

Brantford, Ont.

Steel structural shop, $13,500, Mohawk street. Owner, Cockshutt Plow Co., Brantford; general contractor, A. E. Faulkener, Brantford. One sty. and basement, 112 x 50, brick, concrete foundation, tar and gravel roof. Contract let August 23rd. Heating and plumbing contract not let yet. No plastering. Iron work supplied by company. Building to be completed November 1, 1911.

Guelph, Ont.

Factory for rubber goods. Owner, Independent Tire Co., Guelph; architect, W. Mahoney, Guelph; general contractor, P. H. Secord & Sons, Limited, Brantford. Three stys., 65 x 225 and basement, reinforced concrete, fireproof. Contract let August 22nd; building to be completed Febuary 1, 1912. Heating and plumbing contract not let yet.

Hamilton, Ont.

Addition to factory, $250,000. Owner, International Harvester Co.; general contractor, David Dick & Sons, Welland, 400 x 100 feet, 2-sty., and basement, reinforced concrete and steel. Other extensions are also contemplated.

Montreal, Que.

Graham & Brouillette, [illegible] Elizabeth st., have been awarded the contract for the erection of a $3,000 dry goods store at 195 Notre Dame, by O. Massicotte & Cote, La Patrie Bldg. G. A. Monette, 97 St. James street, architect, 2-sty., 60 x 21, brick and stone.

Warehouse, $23,000. Owner, Imperial Oil Co., Ltd., 105 Board of Trade Bldg., Montreal; architect, Thos. W. Clark, New York; general contractors, Reid, MacGregor & Reid, 668 St. Catharine street west, Montreal. Three sty., 82 ft. 6 in. x 65 ft., fireproof construction, concrete foundation.

Neepawa, Man.

Telephone exchange. Jas. McIntosh has been awarded contract for the new brick and stone building, 81 x 32. Cost $11,000. A hoist will also be installed.

Ottawa, Ont.

Business building. Owner, D. H. McLean, Ottawa; architect, W. E. Noffke, Central Chambers, Ottawa. Two stys., 100 x 60, brick and steel, concrete foundation, tar and gravel roofing, electric light, structural iron, sheet metal. Heating and plumbing contracts not yet awarded.

Addition to warehouse, Nicholas st. Owner, Dominion Warehousing Co., Ottawa; architect, Jas. Mather, Wellington street, Ottawa; general contractor, Holbrook & Sutherland, Ottawa; steel work contractor, Dominion Steel Company. Three stys., steel and brick. Tenders to be called for freight elevators, 12 ft. x 8½ ft., also for galvanized iron work, electric work, plumbing, felt and gravel roofing.

Saskatoon, Sask.

Business building, $60,000, 22nd st. and 2nd ave. Owner, Herbert Weston; architects, Thompson, Daniel & Colthurst; contractor, George Archibald, Winnipeg. Brick, fireproof construction.

Toronto, Ont.

Stores and dwelling, $5,000, Kingston road and Beach ave. Owner, H. Zimmerman, 540 Kingston road, Toronto; architect, T. A. Kapes, 72 Spruce Hill road, Toronto; masonry contractor, Geo. Wibby, Silver Birch ave., Toronto; carpentry, T. A. Kapes, 72 Spruce Hill road, Toronto. Two stys., 55 x 32, brick, brick foundation, hot water heating, electric light, shingle, felt and gravel roofing, mantels, plate glass. Tenders will be called in about three weeks for plumbing, heating, plastering and wiring.

Winnipeg, Man.

Warehouse. Owner, Swift Canadian Co., Ltd., Louise Bridge, Winnipeg; architect, C. H. Kane, Chicago; general contractor, McDiarmid Co., Ltd., 138 Portage ave., Winnipeg. Three sty. and basement, 78 x 132, reinforced concrete. All work will be done by general contractor. Building to be completed February, 1912.

Power Plants, Electricity and Telephones

Edmonds, Burnaby, B.C.

By-laws carried for power.

The ratepayers voted in favor of the Western Canada Power by-law. This authorizes the construction of steel towers capable of carrying high voltage electric wires [illegible] the Edmonds road and also poles on other roads for stringing [illegible]

(Continued on page 66)

Tenders and For Sale Department

Trench Machines

Parsons—Cuts trench 27 in. to 60 in., to 20 ft. deep, fine order.

Parsons—With Mattes Back Filler, cuts trench 28 in. to 78 in. to 20 ft. deep. Overhauled and first class. Write us if you have anything to sell, or if in want of anything.

THE MALES CO.

No. 82 Perin Building, Cincinnati, O.

Notice to Ditch Contractors

Tenders Wanted

Tenders will be received by the undersigned Township Clerk up to 2 o'clock p.m. on **Monday, the 4th day of September, 1911,** for the construction of Municipal Drain No. 2 in the Township of Maryborough, containing about 43,000 cubic yards of excavation.

Plans, profiles and specifications of this drain may be seen at the Township Clerk's office in the village of Moorefield, or at the engineer's office at West Montrose.

The lowest or any tender not necessarily accepted.

Satisfactory bondsmen or a marked cheque for five per cent. of tender will be required.

C. D. BOWMAN, O.L.S,,
Engineer in Charge,
West Montrose P.O.

W. W. SCOTT,
Clerk of Tp. of Maryborough.
Moorefield P.O.

34-35

To Contractors

Sealed tenders endorsed "Tenders for Library Shelving and Fittings," addressed to the undersigned, will be received at this Department until noon on **Tuesday, the 5th of September, 1911**, for the library metal shelving and fittings required in connection with the Library Addition to the Ontario Government Buildings, Queen's Park. Plans and specifications may be seen and blank forms of tender obtained at the offices of Geo. W. Gouinlock, architect, 1108 Temple Building, Toronto.

An accepted bank cheque payable to the order of the Honorable J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender, and the bona fide signature and addresses of two sureties, or the bond of a Guarantee Company, approved by this Department, must accompany each tender.

The Department will not be bound to accept the lowest or any tender.

By order,

H. F. McNAUGHTEN,
Secretary of Public Works.

Department of Public Works, Ontario,
Toronto, August 16th, 1911.

Newspapers publishing this advertisement without authority will not be paid for it. 34-35

FOR SALE

Complete Electric Generating Set, consisting of Leonard Peerless steam engine direct connected to 150 k.w. Canadian General Electric generator, 2,300 volts, 60 cycles; also condenser, switchboard, steam and exhaust piping, spare parts for engine and generator, and everything constituting the complete set as at present installed in the Thomas street lighting station of the Town of Brockville. This machine is in first-class order, having only been used on peak loads. It is now being replaced by a larger Belliss & Morcom engine with Swedish G. E. generator. Full particulars and price can be obtained from Laurie & Lamb, Consulting Engineers, Board of Trade Building, Montreal.

28-35

To Contractors

Tenders will be received at the office of the Secretary, School of Mining, Kingston, up to 3 p.m. of **Friday, September 1st**, for the Cabinet Work, comprising Tables, Benches, Fume Cupboards and other Furniture, and also Plumbing and Fitters' Works required in the completion of the Nichol Building for Governors of the School of Mining.

Plans and Specifications may be seen at the office of the undersigned.

The lowest or any tender not necessarily accepted.

POWER & SON,
Architects.

Merchants Bank Chambers,
Kingston, Ont.

34-35

Toronto Main Drainage Works

Sealed tenders for the construction of the following sewers will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon of **Tuesday, September 12th, 1911.**

Storm Overflow Sewers—Sorauren Division.

Total length 8,897 linear feet, including the laying of 30 and 36 inch concrete pipe and the supplying and laying of 24-inch cast iron pipe, and 15, 18 and 24 inch vitrified pipe.

Storm Overflow Sewers—Manchester Division

906 linear feet of 3 ft. 4 in. x 3 ft. 8 in. concrete culvert, in open cut.

High Level Interceptor—Section No. 14

985 linear feet of 3 ft. 0 in. x 4 ft. 6 in. egg-shape, brick, in tunnel.

Plans, specifications, forms of tender and conditions relating to tendering as prescribed in City By-laws may be obtained from the Main Drainage Works, Office of City Engineer, Toronto.

The lowest or any tender not necessarily accepted.

G. R. GEARY, Mayor,
Chairman, Board of Control.

City Hall, Toronto,
August 18th, 1911.

34-35

Tenders Wanted

Sealed proposals for an Intake Pipe and Screen Well for the City of Windsor, Ont., addressed to the Secretary of the Water Commissioners, Windsor, Ont., and endorsed "Proposals for Intake Pipe and Screen Well for Windsor Waterworks," will be received at the office of the Water Commissioners of the City of Windsor, Ont., until 12 o'clock noon, **Tuesday, September 12, 1911.**

Proposals shall be made in accordance with the specifications and requirements on file in the office of the Water Commissioners.

Each proposal shall be accompanied by a certified cheque equal to ten per cent. of the amount of tender as surety for the acceptance of the contract, payable on its face to the Water Commissioners of the City of Windsor, Ont.

The accepted contractor will be required to furnish an approved Guaranty or Surety Bond in the sum of 50 per cent. of the full amount of his contract.

The Commissioners reserve the right to reject any or all proposals.

Copies of plans and specifications are on file at the Water Office, Windsor, and also at the office of Smith, Hinchman & Grylls, Detroit, Mich.

By order of the Commissioners,

34 35

W. A. HANRAHAN,
Secretary.

CITY OF TORONTO

Extension of Time

Tenders for the Supply of Rail Accessories

Separate or bulk tenders on prescribed forms will be received by registered post only addressed to the Chairman of the Board of Control, City Hall, Toronto, Canada, up to noon on **Thursday, September 7th, 1911**, instead of August 31st, as previously advertised, for the supply of the following:—

(1) 325 kegs track spikes (200 lbs.) per keg, size of spike 5½ in. x 9-16 in., measured under head.

(2) 1,950 pairs of splice bars.

(3) 9,500 tie rods, 7-8 in. diameter.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Specifications and forms of tender may be obtained on application to the Department of Railways and Canals, City Hall, Toronto.

The tenderers shall submit with their tender the names of two sureties (approved of by the City Treasurer, not members of the City Council or Officers of the Corporation of the City of Toronto) or in lieu of said sureties, the bond of a Guarantee Company, approved of as aforesaid.

The lowest or any tender not necessarily accepted.

G. R. Geary, Mayor.
Chairman of the Board of Control.

City Hall, Toronto,
August 21st, 1911.

35-35

Tenders Wanted

Sealed tenders, marked "Tenders for Tile Drains," will be received by the undersigned up to **September 11th**, for the construction of a system of tile drains, consisting of approximately 29,000 feet of tile. Plans and specifications may be seen at the office of the undersigned, Bell Telephone Building, Guelph, and at the office of the Canadian Engineer, 62 Church Street, Toronto.

The lowest or any tender not necessarily accepted.

J. W. LYON, President,
35-35 Guelph Radial Railway Co.

Department of Railways and Canals, Canada

Intercolonial Railway

Passenger Station, Truro, Nova Scotia

Extension of Time

The time for receiving tenders for the construction of a "Stone Passenger Station" at Truro, Nova Scotia, has been further extended from Thursday, the 31st August until 12 o'clock noon on **Friday, the 15th September, 1911.**

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, August 24th, 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 35-36

Town of Scott

Sealed tenders will be received by G. M. Phillips, Secretary-treasurer, of the Town of Scott, Sask., until noon of **Monday, September 25, 1911**, for supply and delivery of the following machinery and materials, and for the performance of certain works.

Tender A.—Supply and Delivery of—
Generator and exciter and switchboard.
Transformers and meters.
Series tungsten street lighting system.
Pumping machinery.

Tender B.—Supply and Delivery of—
Two pneumatic storage tanks.

Tender C.—Supply and Deliverp of—
Approximately 2,200 ft. of 8-inch steel wire pipe.
Approximately 7,000 feet of 6-inch steel water pipe.
Approximately 5,400 feet of 4-inch steel water pipe.
Approximately 15 hydrants and 22 valves.

Tender D.—
Trenching and laying steel water pipe, setting hydrants, valves, etc., and back filling.

Tender E.—
Erection of a power house and construction of a reservoir.

Plans and specifications may be seen at the offices of the Canadian Engineer, Winnipeg, Toronto and Montreal, and at the Consulting Engineer's office, Bottomly Block, Saskatoon.

A marked cheque for five per cent. of amount of the tender must accompany each bid.

The lowest or any tender not necessarily accepted.

McARTHUR & MURPHY, Engineers,
Bottomly Block, Saskatoon.
G. M. PHILLIPS, Sec.-Treasurer,
Scott, Sask.

For Sale

One R. McDougal engine lathe, new, swing over bed 30-in., distance between centers 20 ft., with motor drive; also one set of 3-in. raising blocks. Price $2,050. Address, The Canadian Pipe Company, Limited, 550 Pacific street, Vancouver, B.C. 35-37

CITY OF HULL

Water Works System

Cast Iron Pipes

Sealed tenders addressed to the City Clerk, Hull, and marked as to contents, will be received up to 4 o'clock, **September 5th, 1911**, for the following materials:—

1,500 ft. of 20-in. cast iron pipe.
4,356 ft. of 12-in. cast iron pipe.
6,760 ft. of 10-in. cast iron pipe.
4,425 ft. of 8-in. cast iron pipe.
9,685 ft. of 6-in. cast iron pipe.
200 ft. of 5-in. cast iron pipe.
2,525 ft. of 4-in. cast iron pipe.
61,193 lbs. connection of different sizes and style, according to plans.

Valves

Two valves of 20-in
Three valves of 12-in.
Seven valves of 10-in.
Five valves of 8-in.
Twelve valves of 6-in.
Four valves of 5-in.
Three valves of 4-in.
Twenty-two 3-nozzle hydrants, sketch of different make shall accompany the tenders.

N.B.—The lowest or any tender not necessarily accepted.

J. P. ALBERT LAFOREST,
35-35 City Engineer.

Department of Militia and Defence

Concrete Retaining Wall, Long Branch Rifle Range, Toronto

Notice to Contractors

Sealed tenders marked on envelope "Tender for Retaining Wall, Long Branch Rifle Ranges," and addressed to the Director of Contracts, Department of Militia and Defence, Ottawa, will be received until noon, **September 4th, 1911**, for the construction of a concrete retaining wall at Long Branch Rifle Range, Toronto, Ont.

Plans and specifications can be seen and full information obtained at the offices of the General Officer Commanding 2nd Division, 215 Simcoe street, Toronto, Ont., and the Director of Engineer Services, Department of Militia and Defence, Ottawa.

Tenders must be made on the form supplied by the Department, and accompanied by an accepted cheque on a Canadian chartered bank for ten per cent. (10 p.c.) of the amount of the tender, payable to the order of the Honorable the Minister of Militia and Defence, which amount will be forfeited if the party tendering declines to enter into or fails to complete the contract in accordance with his tender.

The Department does not bind itself to accept the lowest or any tender.

EUGENE FISET, Colonel,
Deputy Minister.

Department of Militia and Defence,
Ottawa, August [illegible], 1911

Newspapers will not be paid if this advertisement is inserted without the authority of the Department. 35-35

CITY OF TORONTO
CANADA

Underground Subway Construction

It is the intention of the City of Toronto to call for tender for construction of double track underground subways, approximately three miles in length, on or about September 15th.

Intending bidders please be governed accordingly.

G. R. GEARY, Mayor.

City Hall, Toronto,
August 25th, 1911 35-36

Tenders Wanted

Sealed tenders will be received for the construction of a new Y. M. C. A. building in Guelph, Ont., up to noon on September 5th, 1911

Plans and specifications can be seen at the office of Messrs. Mills & Hutton, architects, Hamilton, or Mr. W. A. Mahoney, architect, Guelph, Ont., from whom all information will be given.

Tenders will be received for each work separately or in bulk and to be addressed to H. G. Cockburn, Chairman, Guelph, Ont., marked "Tender, Y. M. C. A.

The lowest or any tender not necessarily accepted. 35-35

Department of Railways and Canals

Notice to Contractors

ST. PETERS CANAL

Sealed tenders addressed to the undersigned and endorsed "Tender for St. Peters Canal Improvements," will be received at this office until 16 o'clock on Tuesday, September 12th.

Plans, specifications and form of contract to be entered into can be seen on and after August 21st at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, at the office of the Resident Engineer, Ontasio St. Lawrence Canals, Cornwall, Ont., and at the office of the Resident Engineer, St. Peters Canas, St. Peters, Cape Breton, at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $25,000, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, August [illegible], 1911.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 35-36

MACHINERY BARGAINS

We have for sale for quick shipment from point near Montreal in Canada, several 18-ton saddle back four-wheel contractors' locomotives, and four dozen 4-yard two-way side dump con[illegible] 36-in. gauge.

Also one No. 4 Austin gyratory stone crusher with elevator and screen for same.

These items in good condition for immediate service and at attractive prices. For particulars, [illegible]

WILLIS SHAW MACHINERY CO.,
39 South LaSalle Street, Chicago, Ill.

Positions Vacant

Advertisements under this heading two cents a word per insertion.. Minimum charge 50 cents

[illegible] having good general experience in civil draughting and design. Must be able to produce neat and speedy work. Permanent position for suitable man. Apply, stating ex[illegible] and salary expected, to J. M. Wilson, City Engineer, Moose Jaw. 35-36

Miscellaneous

Advertisements under this heading one cent a word per insertion. Box No. ten cents extra

An experienced man with executive ability to take position of Superintendent of Operation of extensive high tension transmission system. Ability to handle men necessary. State fully training and experience, whether married, age, salary required, and other particulars. Apply Box 323, Contract Record, Toronto, Ont. 35-36

WANTED

Large American firm manufacturing the most up-to-date dry kiln system for drying lumber wants to secure reliable Canadian representatives. System patented in Canada and several installations made. Apply E. J. MacIntyre, 4059 Perry Street, Chicago, Ill. 34-35

Power Plants, Electricity and Telephones

([illegible]ed from page 63)

Calgary, Alta.
In order to meet the demand for power which the industrial growth of the city has necessitated, the Calgary Power Company is at present engaged in locating a second transmission line from the Horseshoe Falls, on the Elbow River, to their power house in this city.

Mimico, Ont.
On September 16th a by-law to provide $7,500 for a power plant will be voted on.

Prince Rupert, B.C.
Surveys being made for supply of power, Khtada River, 42 miles distant. Owner, Prince Rupert Hydro-electric Co.; general superintendent, T. Clark Durant, Prince Rupert. Plans are being prepared by R. F. Hayward, of the Western Canada Power Company, Winnipeg. Surveys being made by Thos. Kennaugh, C.E. Work has begun on construction camp. The company will instal a 3,000 kw. plant within twelve months.

Niagara Falls, Ont.
Canadian Niagara Power Company, Niagara Falls, plan to instal new dynamos, turbines and general power house equipment. Work is now in progress for power house. Contractor for iron work, Hamilton Bridge Works Company. Balance of work to be done by day labor. Estimated cost of extension about $125,000.

Portage la Prairie, Man.
The ratepayers will shortly vote on a by-law to purchase the entire plant of the Central Electric and Gas Co., for $110,000.

Red Deer, Alta.
Preliminary surveys for hydro-electric plant. The Board of Trade have engaged the John Galt Engineering Co. of Calgary to make preliminary surveys for a hydro-electric plant. Sec'y of Bd. of Trade, R. T. Davison.

Saskatoon, Sask.
A by-law will be submitted on August 24, for the raising of $75,000 for extensions to the electric light and power system of the city.

Victoria, B.C.
Proposed extension of street lighting, View street. Owner, City of Victoria; purchasing agent, W. W. Northcott. Plan proposed for extension of cluster lighting system. Provision to be made for arc wires supplying light to James Bay district.

Winnipeg, Man.
Tenders called for electrical supplies. Owner, Board of Control, Winnipeg. Manufacture and delivery f.o.b. Winnipeg, of the following supplies. A.—Mercury arc transformers and rectifiers. B.—Magnetite or metallic flame arc lamps. C.—Electrodes. D.—Inner and outer globes. Specifications, etc., at office of the general manager of the City Light & Power Dept., 449 Main street, Winnipeg. Tenders received by Chairman, Board of Control, until 11 a.m., September 11th.

Tenders called for power house and laundry. Owner, Board of Control, Winnipeg; secretary, M. Peterson, Board of Control office, Winnipeg; architect, G. G. Teeter, Builders' Exchange. Supply of labor and materials required in the erection of a power house and laundry for the city hospitals on the Riverview site. Plans, etc., at office of the architect. Tenders to be accompanied by accepted cheque for 5 per cent. of amount of tender. Tenders received by Chairman, Board of Control, until 11 a.m., September 5th.

Tenders called for underground cable. Owner, City of Winnipeg. Secy., Board of Control, M. Peterson. Manufacture delivery and installation of underground cable for electrical distribution system. Specifications, etc., at office of general manager, Light & Power Dept., 449 Main strret, Winnipeg. Tenders received by Chairman, Board of Control, until 11 a.m. August 28th.

Miscellaneous

Winnipeg, Man.
Tenders called for supply of cedar poles. Owner, City of Winnipeg. M. Peterson, secretary, Board of Control. Supply of poles for Winnipeg Electrical Distribution system. Specifications at office of general manager, light and power department, 449 Main street. Tenders received by chairman until 11 a.m., August 25.

New Companies

Prince Rupert Hydro-Electric Company, Ltd., incorporated, with a capital of $5,000,000, head office Prince Rupert. Lewis W. Patmore, attorney for the company.

de Northall Engineering and Construction Co., Ltd., Vancouver, B.C., incorporated, with a capital of $100,000.

Vancouver Lumber Co., Ltd., Vancouver, B.C., incorporated, with a capital of $4,000,000.

Victoria Shoe Manufacturing Co., Ltd., 924 Langley street, Victoria, B.C., incorporated, with a capital of $5,000,000.

Thompson and Carper, Limited, Vancouver, B.C., incorporated, capital $50,000, to act as agents for purchase of real estate, timber limits, power sites, etc.

The National Timber Co., Ltd., Vancouver, B.C., incorporated, with a capital of $250,000.

Jones and Rant, Limited, incorporated, with a capital of $50,000, to carry on business as bridge and road builders, brick and tile manufacturers, etc., head office, Vancouver, B.C.

Becker & Co. of America, Ltd., Toronto, Ont., incorporated, with a capital of $100,000, to carry on business as timber merchants, dealers in pulpwood, wood, lumber, etc. Incorporators, Wm. P. Ryrie, Francis Cole Lalonde and Wm. Symon Mortlock, all of Toronto.

Economic Realty Limited, Montreal, Que., incorporated, with a capital of $100,000, to carry on the business of a general land and building company. Incorporators include Jas. W. Domville, Casimer Dessaulles and Paul Lorrain, all of Montreal.

The Whalen Land Corporation, Ltd., Port Arthur, Ont., has been incorporated, with a capital of $250,000, to carry on a general land, building and lumbering business. Incorporators, Alex. Jarvis McComber and Wm. Fitzgerald Langworthy, both of Port Arthur.

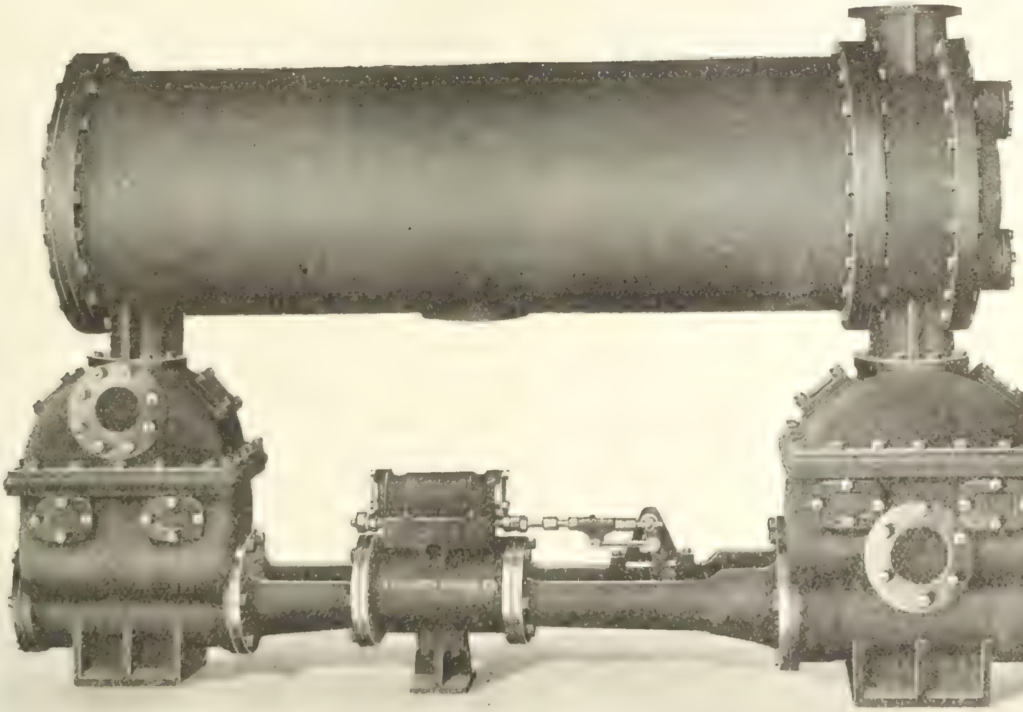
The Flexible Conduit Co., Ltd., Guelph, Ont., has been incorporated, with a capital stock of $50,000, to manufacture and deal in textile materials, conduits, cables and other electric supplies. Provisional directors include Geo. Edmund Courtice of Clinton, Ont., Jas. Ernest Carter and John McPherson Taylor, both of Guelph.
both of Guelph.

The Raye Finance Co., Ltd., Montreal, Que., incorporated, with a capital of of $125,000, to carry on business as builders ,to purchase or acquire power sites, timber limits, mining rights, etc. The Incorparators include Jno. Joseph Meagher and Lawrence De K. Stephens, advocates, both of Montreal.

Canadian Sunbeam Co., Ltd., Toronto, Ont., incorporated, with a capital of $200,000, to manufacture and deal in electrical machinery, apparatus, generators, motors, etc. Incorporators, Roland Sydney Morgan, Herbert Sargent Salt and Byron Young Haddy, all of Toronto.

The Bishop Construction Co., Ltd., Traders Bank Building, Toronto, have been awarded the contract for the erection of the plant for the Swift Canadian Co., Toronto Junction, and also for the Union Stock Yards Company's new reinforced concrete building.

CONDENSORS



Condensor built by The John Inglis Co., Limited

BOILERS, ENGINES, PENSTOCKS, Water Towers, Steel Tanks, Heavy Plate Work, Condensors, Air Compressors, Pumping Machinery, Special Machinery of all kinds

Let us Submit Prices.

The John Inglis Company
Limited
Engineers and Boilermakers
14 Strachan Ave., TORONTO, Canada

ANDRESEN-EVANS GRAB BUCKET

Note the Wide Opening—50% Greater than Clam Shells

Cutting action extends over a stroke one half longer, and is therefore a better filler

FULL BUCKETS ASSURED

resulting in maximum efficiency of plant

This Improved Excavating **GRAB BUCKET**

Reduces cost and increases profits. Handles ore, coal, crushed stone, sand, gravel etc. For dry or under-water excavation. Greater digging power than the Clam Shell or Orange Peel.

Can be used on any two-drum hoisting equipment. All sizes from 1 to 8 cubic yards. For 2, 3 or 4 Line Operation

H. P. ANDRESEN 112 St. James St. MONTREAL

Municipal Contracts Should be Let at the Lowest Possible Figure

You cannot secure low bids unless you place your proposition before a large number of contractors. The larger the number, the greater the competition and consequent saving on your contract.

More contractors look for proposed work in the

ESTABLISHED 1886
Contract Record
A Weekly Journal of
Building Contracting Engineering Public Works
Municipal Progress Advance Information

than in any other publication. A moderate expenditure in the advertising of proposals will convince you of the service that the CONTRACT RECORD can give you. When you have "Tender" advertising to place do not forget that this paper carries more advertising of this sort than any other journal. CONTRACT RECORD, 220 King St. West, Toronto.

Canada's Advancement

Canada has scores of big undertakings, both governmental and corporate, under way. A few of them are as follows:

The new Quebec bridge is in a progress of construction and will be one of the greatest structures of its kind. It will cost over $12,000,000 and the total length will be 3,228 feet and 150 feet in height above the water mark, with a central suspended span of 610 feet.

The Grand Trunk Pacific Railway will build during 1911, 140 new stations, and the Canadian Pacific Railway will open 50 new towns.

A $3,000,000 dry dock and new naval works are to be built at Montreal. Halifax is to have $2,000,000 spent upon harbor improvements and St. John, $5,000,000 on decks and ship building plants.

The development of water powers of the country is proceeding with great speed. That of Niagara is already serving many parts of Ontario as widely separated as Windsor and Toronto, while plans are being made for the increased utilization of water power from the other great falls in the land and the long canal system.

A direct steamship line from Manchester to the head of Lake Superior is projected.

A new Canadian navy which is to include 12 vessels at the start, already has two of them in commission, largely manned by young Canadian cadets, while a naval college has been opened at Halifax.

Expansions of the commercial and industrial operations are witnessed on every hand. Cities are conducting extensive improvements. Capital is invested in enterprises of all kinds and at no time since confederation has the Canadian national prosperity been so marked or the outlook better.

It is proposed by overcoming certain obstacles in the Saskatchewan river to make a waterway for light draught crafts all the way from the Rocky Mountains to Winnipeg, a distance of over 1,000 miles, while only two breaks occur in the river system of the far north, including the Peace and MacKenzie rivers to the Arctic Ocean.

Old Roman Brick

When the preparations for rebuilding the Campanile in Venice were undertaken the archaelogists were afforded an opportunity to make some interesting studies of the bricks, says Harper's Weekly. It was found that they had been used in arches, fortifications, the tops of walls, and in other ways before they were built, into the Campanile, and that they were not Venetian, but Roman brick. These ancient brick were made in courses, for in many the layers could be seen undisturbed. It is said that brick made this way can bear a greater weight than modern brick. The brick examined were of the first century. One of them bore the imprint of a horseshoe, which may prove that Romans used a horseshoe like ours, although it is generally believed that their horseshoes were strapped on, not nailed.

Over 52 per cent. of the total production of building brick in Canada in 1909 was made in the province of Ontario, and of the Ontario production over 47 per cent. was made in the county of York, so that the city of Toronto and vicinity produces about one-quarter or nearly 30 per cent. of the total brick production of Canada.

MODERN ELEVATORS

Plunger

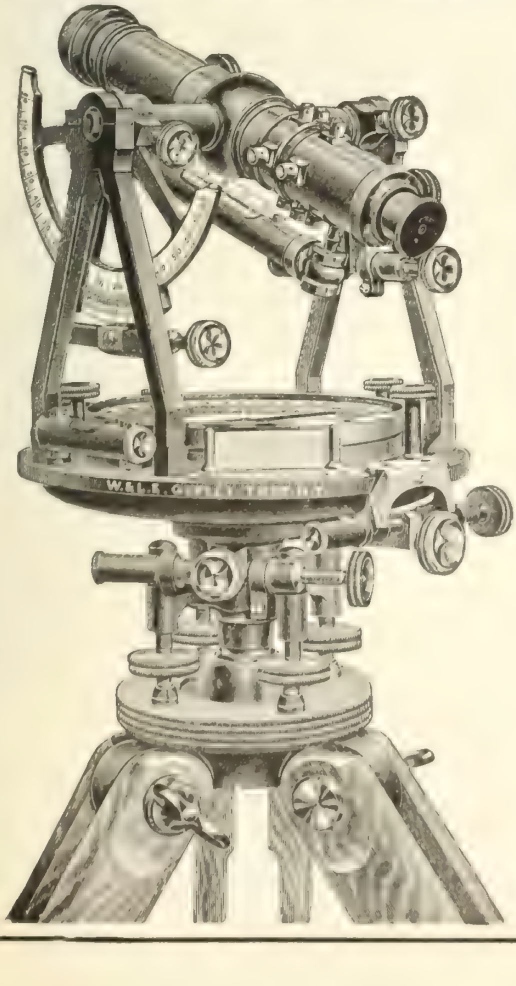
We design and build plunger elevators for both passenger and freight service. These embody many patented features, such as a new main valve, which prevents bounding when the car stops, and a new control valve, which prevents any accidental movement of the car in the opposite direction when passengers are entering or leaving.

Electric

We also design and build electric elevators for both passenger and freight service. These elevators embody many patented improvements and offer greater safety and greater economy and require less attention than any other electric elevator. We solicit inquiries from architects and a others interested in the design of office and factory buildings.

WORKS—512 WILLIAM STREET, MONTREAL

THE JOHN McDOUGALL CALEDONIAN IRON WORKS CO.
LIMITED


W. & L. E. GURLEY TROY

1845 1911

W. & L. E. Gurley

TROY, N. Y.

Largest Manufacturers in America of

Field Instruments

for Civil, Mining and Hydraulic Engineers and Land Surveyors

Transits	Current Meters
Y Levels	Levelling Rods
Compasses	Chains
Plane Tables	Tape Lines

Also Makers of

Physical and Scientific Laboratory Apparatus
Standard Weights and Measures
Accurate Mercurial Thermometers

Branch Factory: Manufacturers Exchange Building Seattle, Wash.

Latest edition of Gurley's Manual sent on Application.

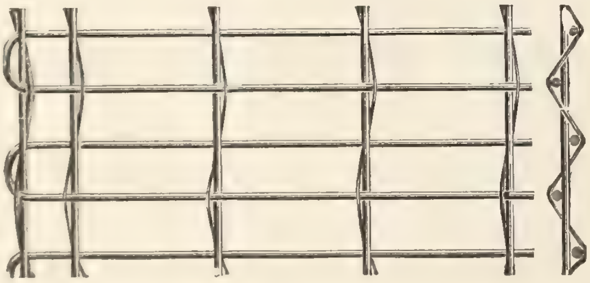
Handling Daylight
with
Luxfer Prisms

With this scientific system, daylight entering a room is bent and handled by means of accurately formed Prismatic Angles in such a manner as to insure it being thrown to places where it is wanting.

Always specify Luxfer and always get the best daylighting results.

Luxfer Prism Company,
Limited,
100 King Street West - - Toronto

WIRE LATHING



Consider the advantages of Greening's Wire Lathing. It is fire proof, rat proof, shrink proof, warp proof. The key is perfect. The plaster cannot become detatched from the lath as it clenches through mesh forming a double coat of plaster. Greening's Wire Lathing is particularly adapted for use in stores, factories and warehouses where the vibration of machinery or the moving of heavy weights is liable to shake the plaster off ordinary wood lathing.

Every Builder and Architect should have our Lath and Wire Reinforcing Catalog.

WRITE FOR CATALOG NO. 6

The B. Greening Wire Company, Limited
HAMILTON, ONT. - MONTREAL, QUE.

Hoisting Engines

Horse Powers
Winches or Crabs

Derricks

Standard sizes and capacities of Derricks in stock for immediate shipment.

Get our catalog and prices. They will interest you. All goods guaranteed.

Marsh & Henthorn, Limited
Belleville, Ont.
Makers of Hoisting Machinery
Sales Agents: MUSSENS Limited, Montreal

If the roof is flat cover it with our

STEEL ROOFING
FOR
FLAT ROOFS

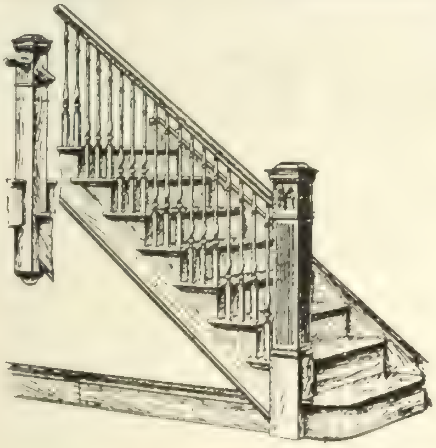
It will make a permanent, watertight and fireproof covering, and is very easy to lay.

Investigate it further. Send to-day for free sample and our illustrated catalogue.

Corrugated Iron	Metallic Shingles
Metallic Sidings	Metallic Ceilings

Etc., Etc.

The Metallic Roofing Co.
LIMITED
Manufacturers
TORONTO, ONT. WINNIPEG, MAN.
31



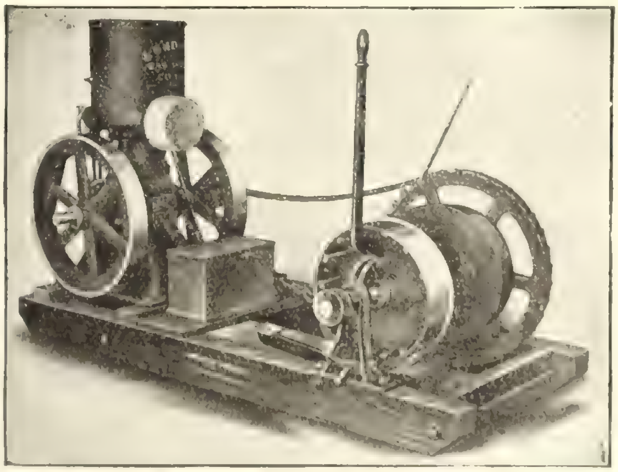
FOR
STAIR WORK
COME
TO US.

We make a specialty of this class of work and are sure we can please you if you give us a chance.

Pine and Hardwood, Veneer Doors and Interior Trim.

Bryan Manufacturing Co.
Limited
COLLINGWOOD, ONTARIO

DO YOU WANT A GOOD HOIST?



Patent Applied For

"London" Friction Clutch Hoist

Here are a few of its many uses

Contractor's Work	Mortar Conveying	Well Digging
Bridge Building	Sewer Building	Pile Driving

This hoist can be used with any make or style of gas, gasoline or oil engine

The London Gas Power Co., Limited
Engineers and Machinists London, Canada

NATIONAL BRIDGE CO.

OF CANADA, Limited

J. N. GREENSHIELDS, Pres. WILLIAM LYALL, Vice-Pres. H. W. BEAUCLERK, Treas. J. L. BROWER, Gen. Mgr.

The 1st Unit of 20,000 Tons Capacity now in Operation

Head Office and Works - - - MONTREAL, QUE.

NOW IS THE TIME

To Arrange For

Next Year's Heating System:

The

Sturtevant

System

Forces the warm air just where it is wanted

It contains no scattered steam piping to freeze or leak.

Send for Catalog No. 112 Z

General Office and Works: HYDE PARK, MASS

Designers and Builders of Heating, Ventilating, Drying and Mechanical Draft Apparatus; Fan Blowers and Exhausters; Rotary Blowers and Exhausters; Steam Engines, Electric Motors and Generating Sets; Pneumatic Separators, Fuel Economizers, Forges, Exhaust Heads, Steam Traps. Steam Turbines, etc.

Adv. No. 868

Tiffin

Flushers, Sprinklers, Dump Wagons

Garbage, Street Cleaning Carts and Municipal Devices

The Most Complete and Perfect Line Made in the United States

THE TIFFIN WAGON CO.

Tiffin, Ohio

Sarnia, Canada

ESTIMATES AND DESIGNS FURNISHED ON APPLICATION

WE ARE MANUFACTURERS OF

Structural Steel

of All Kinds

Railway and Highway Bridges

Steel Buildings

Beams, Channels, Angles, Plates, etc.

IN STOCK

Merriman One-Car Asphalt Plant

The only portable plant that melts asphalt with steam: no coking or burning of asphalt as with direct heat. Capacity 1800 yds. two inch top; or 4000 yds. one-inch binder in ten hours.

Many special features. Write for full particulars.

Also Asphalt Mixers

East Iron & Machine Company, Lima, O., U. S. A.

ENGINES and BOILERS of all types and sizes, Heaters, Tanks, Pumps etc

E. LEONARD & SONS LONDON, ONT.

Agencies: MONTREAL ST. JOHN, N.B. WINNIPEG CALGARY VANCOUVER

Agents for National Gas Engine Co. - Browett-Lindley Vertical Engines

Crushed Stone, Limited

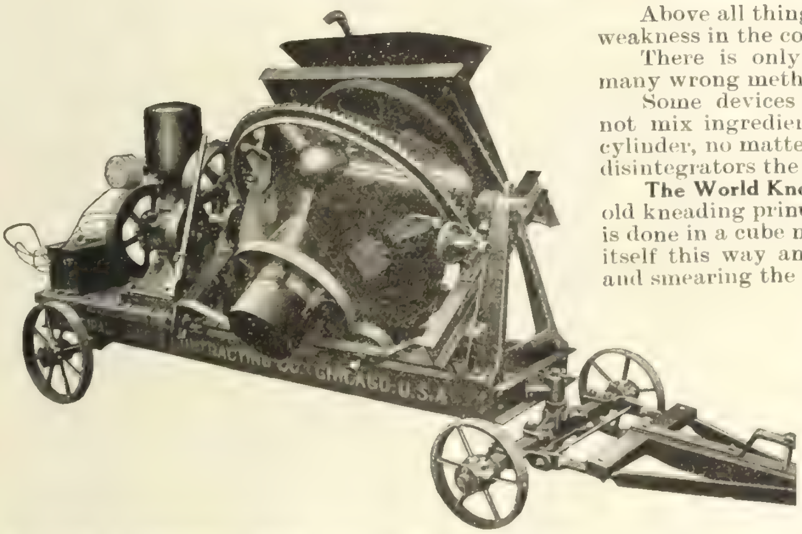
STONE of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:
Kirkfield, Ont.
Phone Main 4516

Head Office:
47 Yonge St. Arcade, **TORONTO**
G. W. ESSERY, Manager

Why Every Engineer Should Specify and Every Contractor Use

CUBE MIXERS



Above all things concrete work must be built to endure. Any weakness in the concrete mass is fatal to the job.

There is only one sure, true method of concrete mixing, but many wrong methods.

Some devices sold as mixers are only separators, You cannot mix ingredients by whirling them around inside a drum or cylinder, no matter how many paddles or shelves and other inside disintegrators the machine may have.

The World Knows No Better Method of Mixing Concrete than the old kneading principle of folding a batch of concrete over itself as is done in a cube mixer, squeezing it together, pounding it against itself this way and that, grinding its particles against each other and smearing the sticky paste composed of the finer particles—all the while changing its shape with 18 different motions to the right and to the left, then forward over and over itself, with ten times as much effectiveness at every rotation of the cube as is possible with three revolutions of the drum-type mixer, which merely whirls it around and separates it as it rotates.

It requires very little investigation to determine which is the true principle of mixing if you will but see the *Chicago Improved Cube Mixer* in operation and compare it with any other method.

MADE IN FOURTEEN SIZES TO SUIT ANY MIXER NEED.

WRITE FOR FREE BOOK NO. 8-H ON SCIENTIFIC CONCRETE MIXING.

Municipal Engineering & Contracting Company

Railway Exchange, Chicago, Ill. **New York Office, 30 Church Street**

Canadian Equipment & Supply Co., Calgary and Vancouver —Agents for Western Canada.

Fred Holmes, President C. P. Holmes, Sec'y-Treas.

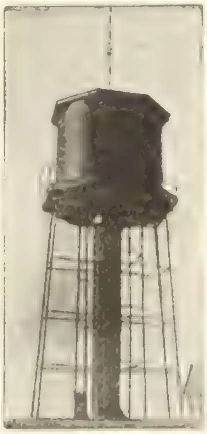
Telephone North 663

Fred Holmes & Sons

Limited

Building Contractors

1113 Yonge St., Toronto



Steel and Wood TANKS

Suitable for Sprinkler Systems
Fire Protection, Water Supply
Plants, etc.

Steel Substructures of all kinds
(Galvanized or Painted)

Windmills, Gasoline Engines,
Hydraulic Rams, Etc.

Ontario Wind Engine & Pump Co.
Limited
TORONTO and WINNIPEG

Note tremendous metal weight on this floor. Entire building of Alsen's Cement reinforced concrete

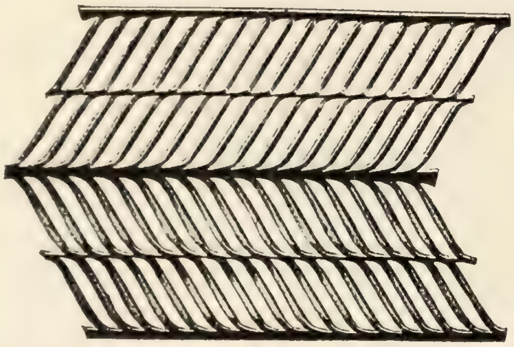
Alsen's Cement

was selected in 1905 for the Panama Canal in preference at equal prices and has exceeded those severe requirements. Sold under a guarantee other Portlands cannot make in good faith. Other brands have been supplied only on modified specifications.

Alsen's American Portland Cement Works
45 BROADWAY, NEW YORK

For Your Choicest Work Use

Sherardized Herringbone Lath



The Toronto Testing Laboratory applied the copper sulphate test for galvanizing to Sherardized Herringbone Lath and obtained seventeen dips as an average of five tests. The Canadian Laboratories, Limited, obtained seventeen dips as an average of four tests. The standard specification for galvanizing is four dips.

Sherardized Herringbone Lath is over four times as good as the Standard.

THE PRICE IS REASONABLE

CLARENCE W. NOBLE
117 Home Life Building, TORONTO, ONT.
Metal Shingle & Siding Company, Manufacturers

Interior Finish

in

Birch, Mahogany, Plain Oak, Quartered Oak, Cypress, etc.

Sash, Doors, Porch Columns, Store Fronts, Mouldings, etc.

S. Anglin & Company
Manufacturers of Fine Woodwork
Kingston, Ontario

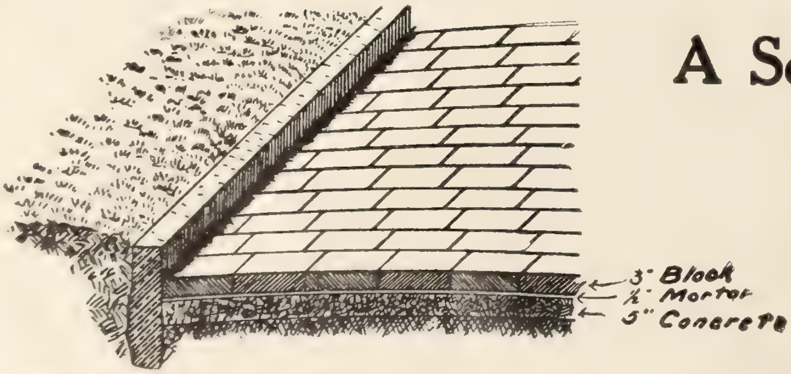
EVERYTHING YOU WANT

in a Factory Site:

Water, drains, sidewalks, gas, electric power, tramways, three railways, police and fire protection and all Montreal's facilities

at

Maisonneuve, Que.



A Scientific Pavement

must be

Durable and Non-Abrasive.
Non-Absorbent and nearly Noiseless.
Unaffected by extremes of Temperature.
Sightly and Sanitary.
Easily Repaired and Easily Cleaned.

These requirements are met by

Asphalt Block Pavements

Send for Descriptive Literature

The Ontario Asphalt Block Company, Limited - Windsor, Ont.

Lap Welded Steel Pipe

MADE IN SIZES

12 to 72 inches Diameter

Used extensively for Water Supply for Mines, Mills, Hydraulic Operations and High Pressure Hydro Electric Installations.
Ask our Welded Pipe Dept. for prices.

American Spiral Pipe Works

MANUFACTURERS OF

SPIRAL RIVETED PIPE LAP WELDED PIPE
FORGED STEEL FLANGES

50 Church St. New York Box 485 Chicago, Ill.

55,000 cu. yds. of Concrete

placed in the foundation of the Municipal Building, New York City.

Doud's "Acme" Center Dump Bucket

used on this construction.

This bucket gave complete satisfaction.

(Extract from letter referring to above.)
"Your bucket in every way has given perfect satisfaction; it is all that the word 'Acme' implies; in my eighteen years experience I have used no better."
W. S. Downing,
(Signed)
Supt. Construction
The Foundation Co

Load deposited perfectly central. Dumps into wagons, hoppers and forms with the same exactness

They always give satisfaction

Patented April 5, 1910

Write for Catalog—Ask about our new Patent Concrete Cart

The Acme Equipment & Engineering Co.

1032 Garfield Building, CLEVELAND, OHIO

SELLING AGENTS

The Dominion Equipment & Supply Co., Winnipeg, Canada

NOTICE

to

Architects and Contractors

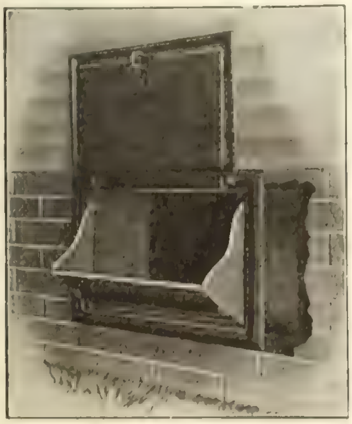
The Page Wire Reinforcement is now supplied in flat sheets in lengths to order. It is a generally accepted fact that wire reinforcement is superior to any other material for bonding, as, pound for pound, it has at least twice the strength of steel put into any other form. The only objection to wire heretofore being the difficulty of laying it properly, owing to its curling because of having been rolled for shipment.

Owing to our invention of special machinery for the manufacture of the fabric in flat sheets, the only drawback to wire as a reinforcement is now eliminated.

The Page Wire Fence Co., Limited

Walkerville, Ont.

Branches:
Montreal 505-517 Notre Dame St., W. Toronto Cor. King St. W. and Atlantic Ave. St. John, N. B.,—37 Dock St.



EQUIP YOUR CELLAR

with one of our "Majestic" Coal Chutes which is the neatest and best equipment for any cellar. It is easily installed in either new or old houses. It permits coal, wood or vegetables to be put into the cellar without disfiguring the building in any way. And unlike a glass window it cannot be broken. The hopper can easily be removed if desired to put in very coarse coal or wood, or if a waggon chute is used. It swings back into the chute and allows the door to be closed. The door is made to lock when opened upward, and protects the wall or siding above the chute, and can be released only when closed. We make three standard sizes. There's a size that's just right for your cellar and your requirements. No. 1—22 x 16 x 13 No. 2—27 x 16 x 13 No. 3—33 x 22 x 18

Send for our illustrated booklet, it shows and describes our full line of Coal Chutes

The Down Draft Furnace Co., Limited

Galt, Ontario, Can.

Montreal Representative: E. F. Dartnell, No. 8 Beaver Hall Square.
Gorman, Clancey & Grindley, Agents, Calgary and Edmonton, Alberta.

TARRING MADE EASY
with

KITON

THE SOLUBLE TAR

No Tarkettle - No Fire

Just Water and a Brush

KITON means the **Best, Simplest** and **Cheapest** method of **Tarring** damp and cold **Walls, Foundations, Concrete, Brick, Cement** or **Woodwork, Tarpaper Roofs, Fences, Watertanks, Reservoirs, Tunnels,** etc., or anything requiring a **cheap, reliable** and **easily applied**

Waterproof or Weather-Resisting Coating

ASK FOR BOOKLET, PRICES AND SAMPLE

F. P. Mansbendel

General Distributor for Canada

212 Huron St., - Toronto, Ont.

British Made

Terra Cotta

the product of

King Brothers, Limited

STOURBRIDGE, ENGLAND

Proprietors of Stourbridge Clays

REDS--BUFF--STONE--GREY

and all Colors, Glazed and Unglazed

Estimates on application by

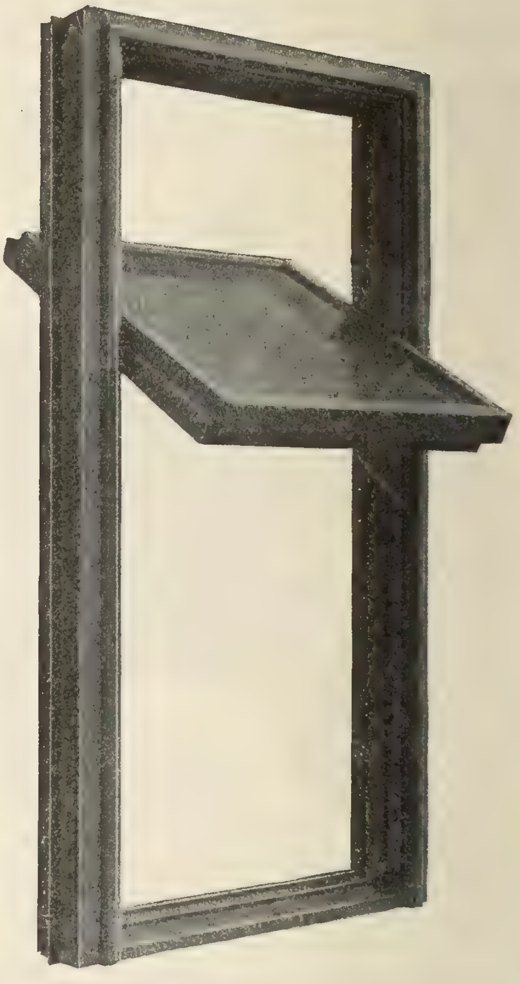
The Toronto Plate Glass Importing Co. Limited

Tel. M. 3877 Don Roadway, Toronto

Reasons why
you should specify

DOUGLAS BROS.

FIREPROOF WINDOWS



View of Double Hung Window

Easy to handle.
Mechanically perfect in construction.
Rigid and easily glazed.
Simply made and easily adjusted.
Made in a model factory by special machinery and skilled workmen.
And always delivered on time.
Other reasons will be found in our catalogue.

SEND FOR A COPY

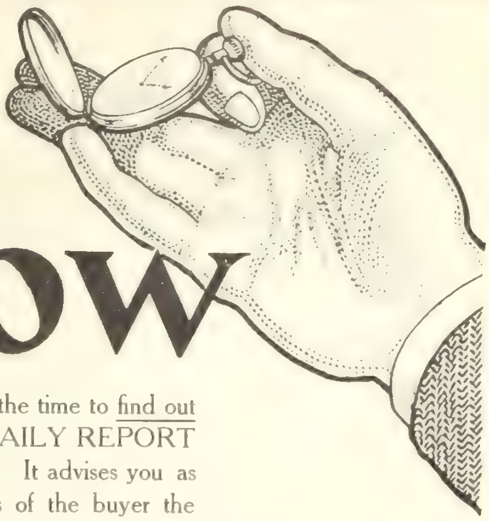
Douglas Bros., Limited

Toronto, Ont. Montreal, Que.

IRON STAIRS

Dennis Wire & Iron Works Co.
London, Canada Limited

Toronto Offices - 12 QUEEN STREET E.



NOW

is the time to find out about our DAILY REPORT SERVICE. It advises you as to the wants of the buyer the same as financial reports do as to his responsibility to pay. It enables you to select from the whole field those opportunities that promise the most profit and which you can handle to the best advantage. It will minimize the effort on your part necessary to locate the man who will place the order. Wider opportunities mean better prices.

Let Us Tell You Just How We Can Assist You in Making Sales

MacLean Daily Reports
Limited
220 King Street West, Toronto

THE QUESTION—

"What is the Best Roller for our Kind of Roadwork?"

is conclusively answered by the

WATEROUS Double Cylinder STEAM ROLLER

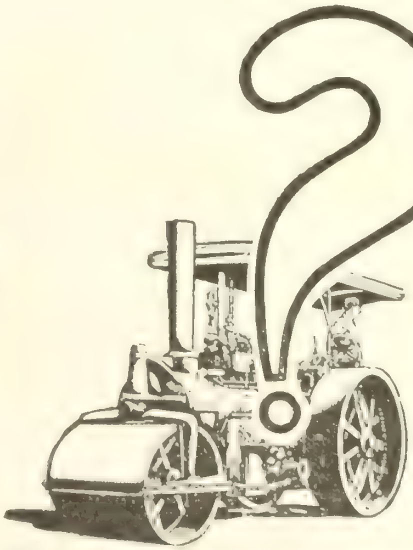
Over 100 Waterous Rollers are operating in Canada to-day. This means one at least in every province in the Dominion. Each one operating under entirely different conditions—on a different kind of road, using different material, in charge of men of widely different engineering ability. **And each one is making good.**

HERE'S WHY:—

The Waterous Roller carries a double-cylinder double crank engine, has cranks set on the quarter, which means full power at every part of the stroke,—*no dead centres. The Boiler* is of the locomotive type, a quick steady steamer—tested to 165 lbs. steam pressure. Provided with dumping grates and ash pan. Roller has a *two speed drive* for fast and slow work under full steam pressure.

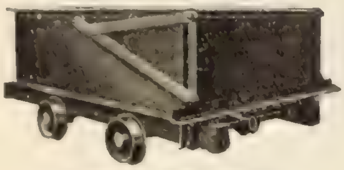
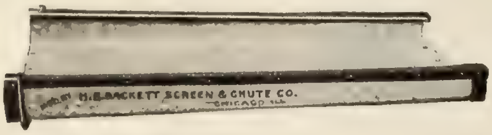
All gearing *cut* from the *solid steel.*

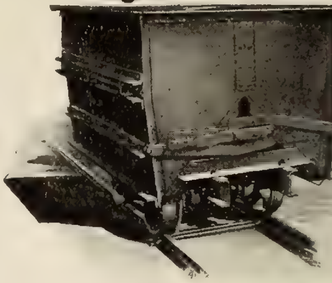
Every part accessible and entirely controlled from the engineer's platform.



When you see a Waterous Roller at work ask the man who's in charge what he thinks of the machine - in the meantime write for our twenty page illustrated Booklet No. 301.

The
Waterous Engine Works Co.
Limited
Brantford, Canada



INDUSTRIAL - CONTRACTORS - EQUIPMENT

Lifting gate End Dump Car

We make these any guage, any size, style and number.

We make chutes of all kinds. For chuting concrete—coal—sand—anything.

Write for our Catalog No. 31-A

We make a specialty of Heavy Sheet Steel work.

Gable bottom car; all sizes

High Quality
Low Prices
Quick Shipments

SACKETT - CHICAGO

1691 Elston Ave., Chicago, Ill.

We are in the Cement Concrete

Culvert and Sewer Pipe

Business

Have Been Building

Concrete Pipes

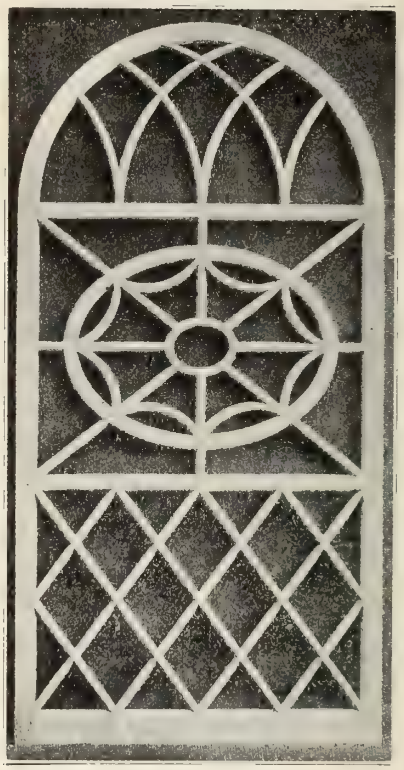
For Twenty Years.

Our quality is the highest. Our prices the lowest. Sizes 6 to 45 inches (REINFORCED.)

Railways and Corporations are amongst our satisfied customers.

Write us your wants—we do the rest.

Ebenezer North Co.
LONDON, ONTARIO



Diamond Sash

particularly suited for Gothic and Queen Ann style windows. It is impossible to successfully manufacture these sash without the proper machinery, but we have it. Every light is uniform, the joints are perfect and all the lines are absolutely straight where they should be and uniformly curved in the curved parts;

M. Brennen & Sons Mfg. Co., Ltd.
HAMILTON, ONTARIO

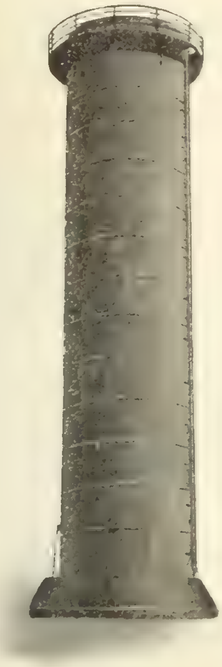
The Carey Roof Standard
CAREY'S FLEXIBLE CEMENT ROOFING

TO PROVE TO YOU the high, standardized construction and composition of Carey's Roofing, we want to send you BOOKLET AND SAMPLE FREE, and give you practical information regarding Carey's Roofing based on 25 years' actual time-proved tests Carey's Roofing is equally adapted to flat or steep surfaces, wood sheathing, tile or concrete. Whether your contract is large or small, we want to show you the advantage of using a standardized roofing material. THE PHILIP CAREY MFG. Co., 60 Wayne Ave. Cincinnati, O. [illegible] Branches

"FAMOUS FOR DURABILITY"

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO
Branches: Vancouver and Winnipeg
Montreal



STAND PIPES

and

Elevated Tanks

Highway Bridge and Concrete Work.

Boilers of all kinds.

Steel Piling.

Over a quarter of a century's experience in the manufacture of these lines.

Get our figures before closing your contracts

The Hunter Bridge & Boiler Co., Ltd.
Kincardine, - Ontario.

Cut shows a Brown Hoist Locomotive Crane at work on the New York-Catskill Aqueduct. This crane is doing the excavating; placing the forms; handling the concrete in tubs; and covering up, besides the other miscellaneous work. *Catalogues are sent on request.*

The Brown Hoisting Machinery Co.
Main Office and Works, CLEVELAND, OHIO.

Chain Belt Mixer

WHEN you study the construction of the Chain Belt Mixer you just naturally wonder how we can make such a good mixer and sell it at a competitive price.

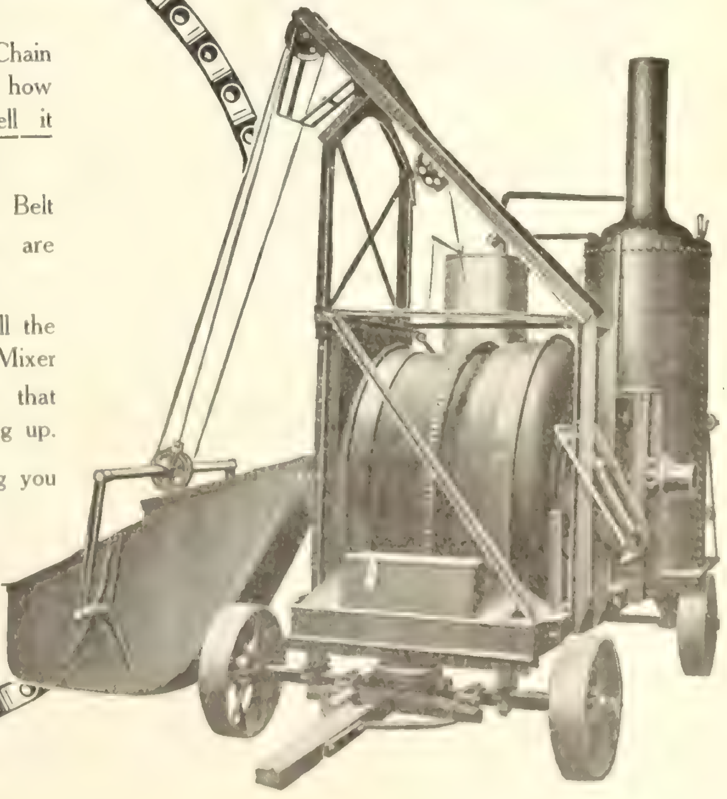
You get more real value in the Chain Belt Mixer because our manufacturing facilities are unequalled in the mixer field.

Every Casting—all the Steel Work—all the Machine Work—in fact every part of the Mixer is made in our factory by an organization that we have been a third of a century in building up.

A line to our nearest agent will bring you catalog and complete information.

Chain Belt Company
Established 1882
Milwaukee, Wis., U.S.A.

CANADIAN REPRESENTATIVES
Mixers in Stock for Immediate Delivery
MONTREAL—Canada Machinery Agency.
WINNIPEG—Dominion Equip. & Sup. Co.
VANCOUVER—Robt. Hamilton & Co.



Everything in Lumber for the Contractor

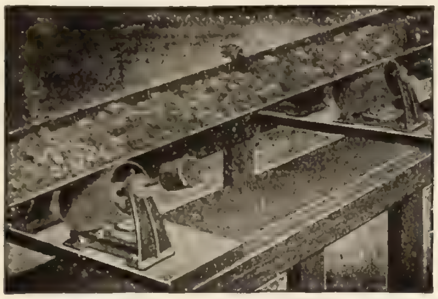
Fir, Hemlock, Spruce, Pine and Oak Timber and Lumber

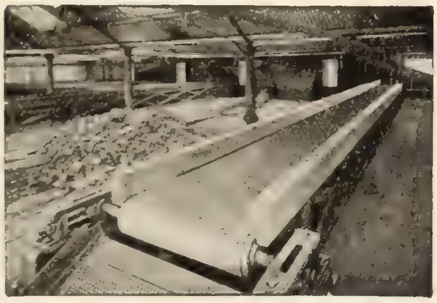
We specialize in

Southern Pine Timber and Piles

10,000 Green Tamarac Piles for Immediate Shipment. Get our Prices.

THE ELMITT LUMBER CO. LIMITED, OTTAWA, ONT.





Scandinavia Belting

The Ideal Conveyor Belt

Good in wet and dry places

Federal Engineering & Supplies, Limited

284 Yonge Street, Toronto

329 St. James St., Montreal

THE

Thames Quarry Co.

St. Mary's, Ont.

CRUSHED STONE

Rubble, Coursing and Dressed Stone

Lime Stone for Flux

JOHN BONIS, Manager

Office Phone 110a Res. Phone 110b

Agent for Toronto: S. H. HURST, 854 Dundas St.

PILE DRIVING

LAND OR WATER

Pile Driving and general contracting concrete work of every description

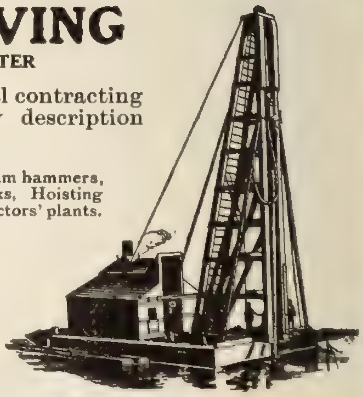
FOR RENT

Pile Drivers, Drop and Steam hammers, Concrete Mixers, Derricks, Hoisting Engines, and other Contractors' plants.

Lincoln Construction Co.

Office: 64 Niagara St.

St. Catharines, - Ont.



The

Missisquoi Marble Company

Limited

Canada's Pioneer and Leading Concern in the Marble Business

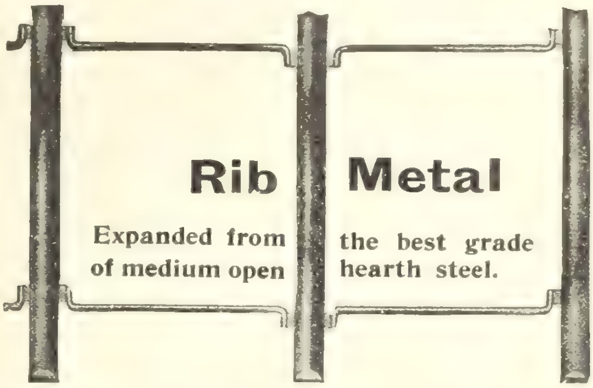
They will sell you Quarry Blocks, Sawn Marble, Marble completely finished for either interior or exterior purposes, and, if necessary, they will contract to set it in place.

Samples may be seen at District Sales Offices:—

Eadie-Douglas, Ltd. - -	Toronto, Ont.
C. N. Barclay - -	Winnipeg Man.
Bosse & Banks - -	Quebec, Que.
General Contractors Supply Company, Ltd. -	Halifax, N. S.
129 Sparks Street - -	Ottawa, Ont.
James Robertson Co. Ltd. -	St. John, N. B.
G. R. Duncan - -	Fort William, Ont.
Walker & Barnes - -	Edmonton, Alta.
The Ritchie Contracting & Supply Co. Ltd. -	Vancouver, B. C.
315 Coristine Building -	Montreal, Que.

KAHN SYSTEM

of Construction includes



Rib Metal

Expanded from the best grade of medium open hearth steel.

Supplied in sheets up to 18 ft. in length, width 16 in. to 5 ft. 4 in. For reinforcing concrete floors, roofs, walls, cisterns, etc.

Other Products—**Kahn Truss Bars, Rib Bars. Hy-Rib, Trus-Con.** Chemical products for waterproofing and finishing concrete.

Trussed Concrete Steel Co.

of Canada, Limited

Head Offices and Works, Walkerville, Ont.

BRANCHES:

TORONTO—23 Jordan St.
WINNIPEG—Union Bank Bldg.
MONTREAL—128 Coristine Bldg.
VANCOUVER—52 Hutchinson Bldg.

The Mullen Gravel Heater

A Money Maker for Contractors

This machine supplies hot gravel for 10 pavers.

The gravel is ready for use in 15 minutes from the time the fire is started.

It is on wheels and easily moved from one job to another.

Tide Water Iron Works

HOBOKEN, N.J. U.S.A.

Everything for the Builder

At the Right Price

Interior Trim Mouldings Turnings

Stair Building Lumber Lath

Shingles Sash Veneer Doors

Pine Doors Frames

"Empire Brand" Hardwood Flooring

LET US QUOTE YOU

J. R. Eaton & Sons

Limited

Orillia, Ontario

Sand and Gravel

Lime
Cement
Plaster
Hair

Fire Clay
Fire Brick
Sewer Pipe
Weeping Tile

Our prices are right and our service good.

Britnell & Co., Limited
C.P.R. Crossing, Yonge St., North Toronto
Phones, Office North { 664 665 Evenings, North 2107

Builders' and Contractors' Supplies

Portland Cement, Lafarge Cement, Gravel, Sand, Rubble, Imported and Canadian Pressed Brick for front work and fireplaces.
CRUSHED STONE—Dimension and Coursing Stone, Lime
FIRE BRICK **IVORY CEMENT PLASTER**

—Yards—
75 Brock Ave., Jarvis Street Wharf,
Avenue Rd. & C. P. R., 355 Eastern Ave.

The Contractors' Supply Co., Limited
Manning Chambers, Toronto Tel. M. 6859

Western Canada Provides a Rich Market

for building, construction and engineering supplies of all kinds. The WESTERN CANADA CONTRACTOR is the only publication west of the Great Lakes devoted to the interests of architects, engineers, contractors builders, etc.

WINNIPEG
WESTERN CANADA
CONTRACTOR
AND BUILDER'S GAZETTE
VANCOUVER
Builders' Supplies
HYDRATED LIME
JOHN GUNN & SONS
Contractors' Machinery
FOR SALE
IF YOU REQUIRE
BUILDERS IRON WORK
CONSULT US
Western Iron Works
WINNIPEG

For rates and other particulars, write

Western Canada Contractor
Commercial Travellers Building - Winnipeg

CRUSHED
All Sizes
STONE

¶ For Roadways and Sidewalks also specially adapted for

Reinforced
Concrete
Construction

¶ Our arrangement with C.P.R. to have our stone brought to Toronto DAILY by SPECIAL TRAIN makes our DELIVERIES promptest possible.

Phone Main 5377 or Write

Christie, Henderson & Co.
Limited
Head Office: **34 Yonge Street, TORONTO**

Perforated Metal
Concrete Reinforcement
In Rolls, Lengths or Sheets

WE SOLICIT YOUR ENQUIRIES
Canada Wire Goods Mfg. Co.
HAMILTON, ONT.

The Largest Cities and Smallest Towns use
W. E. Seagrave Fire Apparatus
MADE IN WALKERVILLE, ONTARIO

There is a Reason:
The name W. E. Seagrave guarantees the Best, the Lightest, the Strongest, the Most Economical in Operation and Maintenance. No order too large. No order too small. Consult us before buying.

Automobile Fire Apparatus and Motor Driven Vehicles of all kinds, our latest Production.

Current Prices of Building Material.

BRICKS

The following are wholesale prices delivered at Toronto:—

	Per B.
No. 1 dry pressed red brick	$18.00
No. 1 dry pressed buff brick	18.00
Red Stock Bricks	12.00
Grey Stock Bricks	11.00
Wire cut bricks for foundation work....	11.00
Porous terra cotta bricks	15.00
No. 1 enamelled bricks, all colors, from	$80.00 to $150.00

WINDOW GLASS

Following are the prices of glass at Toronto, Hamilton and London. These prices are f.o.b., with 30 and 5 per cent. off for wholesale:—

	Star.	D.D.
10 to 25 united inches.......	$4.25	$ 6.25
26 to 40 "	4.65	6.75
41 to 50 "	5.10	7.50
51 to 60 "	5.35	8.50
61 to 70 "	5.75	9.75
71 to 80 "	6.25	11.00
81 to 85 "	7.00	12.50
86 to 90 "	....	15.00
91 to 95 "	....	17.50
96 to 100 "	....	20.50
101 to 105 "	....	24.00
106 to 110 "	....	27.50

The following are wholesale prices for glass at Montreal and jobbing prices at Winnipeg for box lots:—

	Single		Double	
	Mont'l.	W'p'g.	Mont'l.	W'p'g.
25 u.i.	$4.00	$3.50	$ 6.75	$ 5.25
40 u. i.	4.25	3.75	6.75	5.50
50 u. i.	4.75	4.25	8.75	6.50
60 u. i.	5.00	4.75	10.00	7.50
70 u. i.	5.25	5.25	11.50	8.50
80 u. i.	5.75	6.00	12.50	9.50
85 u. i.	....	....	14.00	10.50
90 u. i.	....	....	16.50	11.50
95 u. i.	....	....	18.00	13.50
100 u. i.	....	....	20.00	16.00

50-foot boxes at Montreal, 25-inch Break, $2.10; 40-inch Break, $2.20. Montreal discounts —Single, 25 and 5 per cent. off; D. D., 40 and 10 per cent. off. Winnipeg prices are net.

BUILDING TILES

(Installed in Toronto).

Floor Tile—Ceramic, any color, ¾-inch square, 1-inch hex., and 3-16-inch round, 55 cents per square foot up.

Floor Tile—½-inch square, 65 cents.

Wall Tile—Rock faced, sizes 6 x 2 inch, 2 x 2 incs; colors, buff, grey, granite, red granite, 55 cents per square foot.

Viterous Tile—All sizes, according to color, 55 to 65 cents.

Glazed—White, 6 x 3 inches, 55 cents per square foot.

Matt—Dull finish colors, first, 70 cents.

Capping Coves and Corners, special quotations to suit requirements.

Opalite Tile—3-16 inch No. 1 standard size 6 x 3 inches, 6 x 2 inches, 60 cents.

White glass, installed, 6 x 3 inches, 30 cents.

STEAM FITTERS' AND PLUMBERS' SUPPLIES

Standard compression work, 65 per cent.

High grade compression work, 60 per cent.

Fuller work, 70 per cent.; No. 0, 75 per cent., and 1 and 2 basin cocks, 70 per cent.

Flatway stop and stop and waste cocks, 65 per cent.; roundway, 60 per cent.

No. 4 compression bath cock	net $1.65
No. 4½ Fuller's	net 2.25

Square head brass cocks, 65; iron, 65 per cent.

Heating Apparatus

Hot water boilers, 50 and 10 per cent.; hot water radiators, 50 and 10 per cent.; steam radiators, 50, 10 and 2½ per cent.; wall radiators, 50 and 10 per cent.; specials, such as angles, curves, etc., 25 per cent.

Boilers—Galvanized Iron Range

30-gallon, standard, $4.50; extra heavy, $7.00.

Cast Iron Sinks

16 x 24, $1.00; 18 x 30, $1.15; 18 x 36, $1.95.

Lead Pipe

Lead pipe, 30 per cent. off; lead waste, 30 per cent. off; caulking lead, 4¾ cents per lb.; traps and bends, 50 per cent.

Iron Pipe.

(per 100 ft.)	Black.		Galvanized.
¼ inch	$ 2.03	¼ inch	$ 2.86
⅜ inch	2.25	⅜ inch	3.08
½ inch	2.63	½ inch	3.48
¾ inch	3.28	¾ inch	4.43
1 inch	4.70	1 inch	6.35
1¼ inch	6.41	1¼ inch	8.66
1½ inch	7.70	1½ inch	10.40
2 inch	10.26	2 inch	13.86
2½ inch	16.39	2½ inch	22.14
3 inch	21.52	3 inch	29.07
3½ inch	27.08	3½ inch	36.58
4 inch	30.78	4 inch	41.58

Malleable Fittings—Canadian discount, 40 per cent.

Cast iron fittings, 65; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 4-inch diameter and under, 75 and 10; nipples, 4½-inch and up, 70; malleable lipped unions, 65 per cent.

Soil Pipe and Fittings

Medium and extra heavy pipe and fittings, up to 6-inch, 70 and 10 per cent.

7 and 8-inch pipe, 50 per cent.

Light pipe, 60 and 10 per cent.; fittings, 70 and 10 per cent.

CEMENT, STONE, STEEL, Etc.

Cement, barrel lots, in bags, delivered, Toronto, bags extra, $1.90.

Cement, wholesale, car lots, f.o.b. Toronto, bags extra, $1.70.

Crushed stone, 2-inch, $1.30; 1-inch, $1.30; ⅜-inch, $1.45.

Binder stone, $1.30 per ton, f.o.b. Toronto.

Burnt River rubble stone delivered, $15 to $16 per toise.

Free stone delivered, $15 to $16 per toise.

Brown coursing stone, delivered, $3.25 to $3.50 per yard.

Grey coursing stone, delivered, $2.25 to $2.50 per yard.

PAINTS AND OILS

(Wholesale Prices at Toronto)

Pure White Lead, ground in oil, $6.25 to $6.50 per 100 lbs.

Pure XX Zinc White, ground in oil, $8.50 to $10 per 100 lbs.

Pure Florence Green, ground in oil, $13 to $14 per 100 lbs.

Boised Linseed Oil, in barrels, $1.15 per gallon of 9 lbs.

Raw Linseed Oil, in barrels, $1.12 per gallon of 9 lbs.

Turpentine, in barrels, 8cc per gallon.

Pure Red Lead, dry, $5.00 to $6.00 per 100 lbs.

Brown sills and heads, in the rough, delivered, 40 cents per foot.

Rubble stone in car lots, $1.30 per ton.

Scotch fire brick, delivered, $30 to $35 per M.

Steel channels and beams, $2.60 per 100 pounds. delivered f.o.b. Toronto.

Hard Wall Plaster, unsanded, $8.50, bags extra; sanded, $4.50 in car lots; hydrated lime, $9.00 in car lots.

Lime, per cwt., delivered, 38 cents.

Plaster of Paris, per barrel, delivered, $2.20.

Manilla Rope, best, per pound, 15 cents.

AUTOMATIC SASH HOLDER

saves cord, weights, pulleys, and materials—no pockets—easier to install—for old and new windows. Send for sample and catalog to-day. Agents wanted. Sold by the hardware trade or direct from 277 Broadway, New York.

Automatic Sash Holder Company

The
Laurentian Granite Co.
Limited
MANUFACTURERS OF
Building Granite, Granite Setts, Curbing, Etc.

Samples Furnished and Prices Quoted on Application

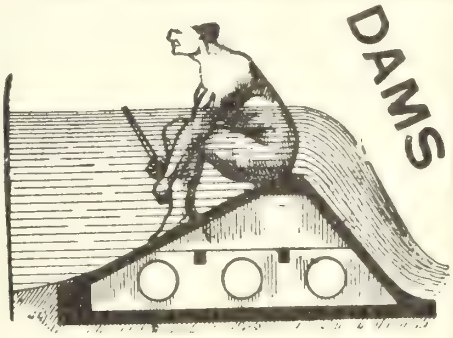
Rose and Pink Granite Quarries at Staynerville, P. Que., Co. Argenteuil, on C.P.R.

Bank of Ottawa Bld'g.
224 St. James St.
Montreal
Bell Tel. M. 4354

ARTIFICIAL STONE PAVEMENTS
SIDEWALKS A SPECIALTY
CORPORATIONS will do well to consider our work and prices before letting contract

The Silica Barytic Stone Company of Ontario, Limited

WALTER MILLS
General Manager.
Head Office:
INGERSOLL, ONT.



AMBURSEN
Hydraulic Construction
Co. of Canada, Limited.

450 Dorchester St. W. - MONTREAL, P.Q.

Reid & Brown
Roof Trusses and Girders
Steel Beams, Channels, Angles, Plates, Column Sections, etc.,
Always in Stock
OFFICE AND WORKS:
Phone M 2341. 63 Esplanade, E. TORONTO

J. HARVEY
CONTRACTOR
Greensville - - Ont.
Driller of Oil, Gas, Salt or Artesian Wells
Deep Wells a Specialty
20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD

Contracts taken in any part of Canada. Several years experience in Artesian Wells for Municipal Water Works. Estimates or geological information cheerfully furnished.

References Given

DOMINION BRIDGE CO.
LIMITED

We Build

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

ESTIMATES FURNISHED FOR STRUCTURAL IRON WORK DELIVERED AT BUILDING OR ERECTED

GEORGE E. EVANS, Ontario Agency
Room 317-318 Confederation Life Building
TORONTO
Telephone: Main 2164

Post Office Address
Dominion Bridge Co., Limited
MONTREAL, QUE.
Works at Lachine Locks, P.Q.

The Canadian Bridge Company, Limited
WALKERVILLE, ONTARIO

Manufacturers of

Steel Buildings
Roof Trusses

Railway and Highway Bridges

Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

Cleveland Bridge and Engineering Co.
Limited
Darlington, England

Bridges
and
Steel Structures

Canadian Offices:
Canadian Express Building, Montreal, Que.

The Pennsylvania Steel Co.
—Bridge and Construction Dep't.—
Steelton, Pennsylvania, U.S.A.

All Structures of Steel

Niagara Railway Arch.

Offices—

New York N.Y.	71 Broadway
Baltimore, Md.	Continental Trust Bldg.
Boston, Mass.	70 Kilby Street
Chicago, Ill.	McCormick Building
Mexico City, Mex.	Edificio de "a Mutua"
Philadelphia, Pa.	Morris Building
San Francisco, Cal.	1505 Chronicle Building
St. Louis, Mo.	Commonwealth Trust Building
London, England	110 Cannon Street
Steelton, Penna.	At Works

W. H. Salter

River Street - TORONTO
Phone M. 3157

Steel Beams

Channels, Angles and Plates - (always in stock)

ONTARIO SELLING AGENTS FOR

Duplex Steel Post Caps

Wall Boxes, Wall Hangers, Joist Hangers, Stirrups, Etc.

BUILDERS and CONTRACTORS

Water Washed Sand
Crushed Granite
Crushed Lime Stone

Prompt Attention Given Orders

Our Dock
Spadina Ave.
PHONES
Office - Adel. 1947
Yard - Adel. 1948

SAND & SUPPLIES, LIMITED
TORONTO

The
Phœnix Bridge & Iron Works Limited
MONTREAL

General Steel Contractors

Large stock I Beams, Channels, Angles, Tees, Zees, and Plates always on hand.

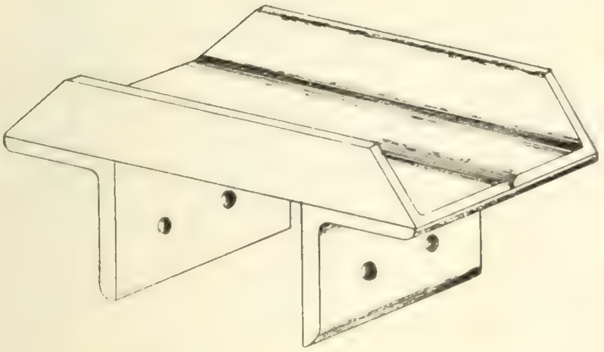
Portland Cement

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks. SEWER PIPES, CULVERT PIPES, etc. Best English Cements. Best Belgian Cement.

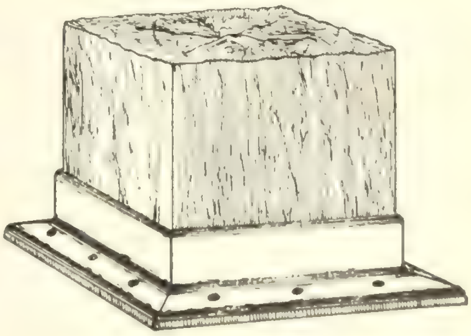
Wm. McNally & Co. - Montreal

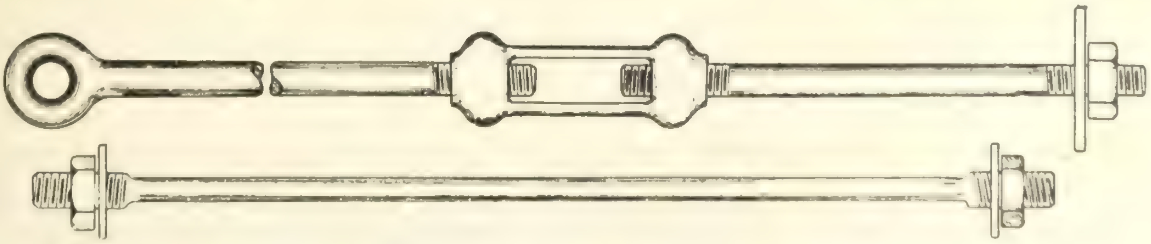
The Hamilton Bridge Works Company Limited

Hamilton, Canada



STEEL POST CAPS and BASES for Wooden Posts, any size. Also made in Cast Iron





EYEBOLTS, TURNBUCKLES and RODS of all descriptions

Beams, Angles, Channels, Plates, any size from 1½ inch to 24 inches, and any length up to 70 feet

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O.BOX 915.

MANUFACTURERS OF

GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE

FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

Architects Owners Contractors

USE

Hard Wall Plaster

instead of lime for plastering

Walls and Ceilings

and get your building

One Month Earlier

H. W. Calkins

Manufacturer

Works
Keele St. & Weston Rd.
West Toronto

Post Office Address
Box 16
West Toronto, Ontario

Write for booklet

A Great Favorite

The man who knows a good thing when he sees it, and who wants a good thing when he hears of it, is the man who will insist upon having

Port Credit Brick

Architects and contractors who cater to this class of men will be acting directly in their own interests by specifying this brand

Port Credit Brick Co.
Limited
Home Bank Building, 8 King Street W., Toronto
Works: Port Credit, Ont.

James Thomson, President. J. G. Allan Vice-President. James A. Thomson, Secretary.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

Manufacturers

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

The Canada Iron Corporation, Limited

CAST IRON PIPE

Head Office:
Mark Fisher Building
MONTREAL

Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, etc., Castings of all kinds, Mooring Bollards for both Concrete and Wooden Docks, Hoisting Machinery.

Dundas Stone

All Sizes—For Concrete, Road Work and Sidewalks.

Flux Stone

With a bin capacity of 3,000 tons we can insure all our customers prompt delivery.

Write or Wire for Quotations

Doolittle & Wilcox, Limited
Dundas - Ontario

Phone Main 6805—6806

The
Roofers Supply Co.
Limited

- Roofing Slate
- Red Slate
- Green Slate
- Mottled Slate
- Black Slate
- Blackboards Slate
- Structural and Electrical Slate
- Terra Cotta Tiles
- Asphalt Pitch
- Tar
- Asbestos Sheathing
- Building Papers
- Tarred Felts
- Ready Roofings

Corrugated Galvanized Sheets

GET OUR PRICES

Bay and Lake Sts. Toronto

- Glass Wired and Rough Rolled
- Galvanized Sheets
- Black Sheet
- Copper Sheet
- Tinplates
- Canada Plate
- Zinc Sheets
- Corrugated Iron
- Gutters
- Pipes
- Elbows
- Spikes
- Nails
- Slater's Tools, Etc.

ROCALITE

The Ready Mixed
Hard Wall Plaster

Manufactured by

Alex. Bremner
Limited
100 Bleury Street - - MONTREAL

"Galvaduct" and "Loricated"

Conduits

for Interior Construction

Conduits Company, Limited
Sole Manufacturers under Canadian and U. S. Letters Patent
Toronto - Canada

Cawthra Mulock, President - - Gordon F. Perry, General Manager

NATIONAL IRON WORKS, Limited

LARGEST MANUFACTURERS IN CANADA OF

CAST IRON PIPE

any size for Water, Gas, Culvert or Sewer

Lake or Rail Shipments

Works and Offices: Ashbridge's Bay, TORONTO

Civil
Electrical
Mechanical

Directory of Engineers

Contractors
Special
Interests

Chipman & Power

Civil Engineers

TORONTO **WINNIPEG**

Willis Chipman. Geo. H. Power.

MOORE & SCOLLAN

CONSULTING ENGINEERS

STEAM, ELECTRIC AND HYDRAULIC POWER

43 KING ST. WEST - TORONTO

T. Harry Mace

ENGINEER

Hydraulic, Steam, Electric, Railway, Municipal, Reinforced Concrete

630 Confederation Life Building, Toronto

H. J. Bowman, M. Can. Soc. C.E.
A. W. Connor, B.A., C.E., A. M. Can. Soc. C.E.

Bowman & Connor

Consulting Municipal and Structural Engineers

Waterworks, Sewerage and Electric Plants
Concrete and Steel Bridges and Buildings
CEMENT TESTING
Toronto St. TORONTO Tel. Main 5724
Branch Office, Berlin. Tel. 122 B.

John B. McRae

Consulting Engineer

Citizen Building, Ottawa

R. S. LEA and H. S. FERGUSON

ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and Paper Mills. Reinforced Concrete Structure of Every Description. Tel Long Dist. Uptown 751.

405 Dorchester Street East, MONTREAL

John. T. Farmer

MECHANICAL AND
HYDRAULIC ENGINEER

427 Coristine Bldg., Montreal

EDW. O. FUCE

Hon. Grad., Univ. Tor. (S.P.S.)
A. M. Can. Soc. C. E. Ont. Land Surveyor

CIVIL ENGINEER

GALT - ONTARIO

Sewerage, Sewage Disposal, Water Works, Reinforced Concrete Structures

Charles H. Mitchell
Percival H. Mitchell

Consulting and Supervising Engineers

Municipal Lighting, Water and Sewerage Work
Hydraulic, Steam and Electrical Power Plants

Traders Bank Building, Toronto

H. SYD. HANCOCK Jr.

A.M. Can. Soc. C.E. A.M. Am. Soc. C.E.

Consulting Civil and Municipal Engineer

SPECIALTIES

Waterworks, Sewerage and Sewage Disposal Reinforced Concrete.

315 Pacfic Building, Vancouver B.C.

JAMES C. KENNEDY

Mem. Can. Soc. C.E.

Civil and Hydraulic Engineer

Water Power Development, Water Supply Systems, Irrigation, &c.
Consultations, Reports, Plans.
Suite 413, Pacific Block, **Vancouver, B. C.**

JOSEPH N. ROULEAU

Submarine Diver

Experience in Concrete Work. Coffer Dams Laying Inlet and Outlet Waterworks and Sewer Pipes. Submarine work of all descriptions. Inspection a specialty.

793½ Somerset St. 110 Empress Ave
OTTAWA, ONT.

The John Galt Engineering Co.

Consulting, Civil and Sanitary Engineers

General Municipal Engineering

Specialties: { **Waterworks, Sewerage and Electric Lighting.**

Winnipeg and Calgary

John Haddin E. L. Miles

Jas. A. McIlwraith

General Contractor

For Bridges, Sewers, Waterworks, Paving and Reinforced Concrete Structures of every description.

COLLINGWOOD, ONT.

Allan Keefer

Architect

Ottawa, Ontario

Arthur L. Weeks

Architect

Canada Life Building, Ottawa

Reinforced concrete and steel structures. factories and commercial buildings

TRADE MARK TAMCO

FOR SALE

"TAMCO" Crushed Stone in all sizes, for all purposes. "Roman" building stone. "Milton" pressed bricks. Sanitary flooring, stone crushers, fire engines, &c.
T. A. MORRISON & CO.
204 St. James Street,
Tel. Main 4532. Montreal.

Robert W. Hunt, President
Thos. C. Irving Jr., Vice-Pres.
Jas. W. Moffat, Secretary
Chas. Warnock, Treas. & Man.

Robert W. Hunt & Co.

Limited

Bureau of Inspection, Tests and Consultation

Head Office and Laboratories,
Canadian Express Bldg., Montreal, Que.
Branch Offices,
Traders Bank Building, Toronto Ont.
Norfolk House, Laurence Pountney Hill, London. E.C.

Rails for Contractors, Switches, Girders, etc. New and Second Hand.

Locomotives and Cars

JOHN J. GARTSHORE

58 Front Street W., TORONTO

Bonds of Suretyship

for Officers and Employees in positions of trust.

Bonds Bid and Supply

in lieu of Certified Cheques, when necessary in Tendering or Contracting for the Furnishing of Supplies.

The Guarrantee Company of North America

The Pioneer Company. *Established 1872*

Head Office - Montreal

Capital and Resources over - $2,000,000
Claims Paid over - - - $2 300,000

No Claims in Dispute

This Company is not a party to any premium tariff combination.

The Smith Marble and Construction Co., Ltd.

Montreal

Office & Factory:
145 Van Horn Ave.

Show Rooms:
458 Bleury Street

Importers,
Manufacturers,
Contractors

OF

Interior and Exterior Marble, Slate, Floor and Wall Tiles, Mosaics, Plumbers and Electrical Marble, Granites for Building and Monumental Work.

When you think of Metal Ceilings think of GALT

A Contractor needs our Metal Ceilings—Because they can be erected

By ANY Carpenter
At ANY Time of the Year
In ANY Kind of Weather

Plans, Instructions, Wood Bracket and Nails Furnished Free.

Get Catalogue A-3

THE GALT ART METAL CO., LIMITED
GALT, ONTARIO

The Canadian Boving Co.

164 Bay St. - TORONTO

(Vancouver, 427 Seymour St., H. W. KENT, Local Manager)

3 K.W. Hours on Switchboard for One Cent

No Smell No Noise No Smoke

Suitable for Public and Private Buildings

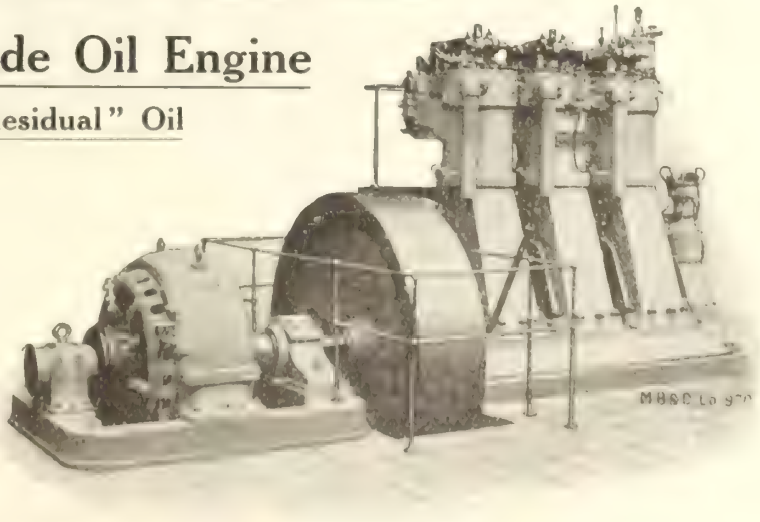
The Mirrlees-Diesel Crude Oil Engine

uses "Fuel," "Gas" or "Residual" Oil

No Ignition Gear
No Producer
No Chimney
No Vapourizer
No Boiler
Self Contained

Continuous Running
No Breakdowns
Cheaper Buildings
and Foundations
Unskilled Labour only
No Standby Losses

HIGH SPEED SLOW SPEED



35 to 1000 B. H. P.

PURE WATER

It is easy to obtain with our plants and apparatus

We design and contract for complete municipal filtration plants of any capacity.

We supply and install apparatus for sterilizing water supplies by the application of calcium hypochlorite.

Literature, Sketches, Estimates and Recommendations Supplied on Request

American Water Softener Co.
1001 Chestnut St., PHILADELPHIA, Pa.

We have no affiliations or working acquirements with any of our competitors.

The Consolidated Stone Company

Quarries and Mills at Bedford, Indiana, and Bloomington, Indiana

Producers of Dark Hollow Buff and Blue
Hunter Buff and Blue Oolitic Limestone

BEDFORD STONE

Celebrated
Bedford Stone

from our quarries has been used in many of the largest public buildings, churches, etc., in the United States and Canada.

Mill blocks, sawed, planed and turned stone of every description furnished on short notice. Write for information.

General Offices
324-327 Monadnock Block - Chicago, Ill.
Toronto Agent
A. P. STEWARD - Builders' Exchange

THE MILTON PRESSED BRICK CO. LIMITED

Why You Should Specify Milton Pressed Brick

For 20 years it has stood unchallenged, the finest brick produced. Hard, clean cut and perfectly free from sand and gravel. Made in red, red flash, buff, brown and a variety of other artistic tints. Milton Pressed Brick has a clean, hard, fresh appearance — it's different from other makes. Send for a sample brick, see if you can break it, and if you succeed, examine its fine quality.

We are Agents for the Fiske Tapestry Brick, suitable for high-class residential work At our Toronto Office we have set up panels of the different color schemes and would be pleased to have you call and examine them.

Head Office: Milton, Ont. Toronto Office: Janes Building
EADIE-DOUGLAS LIMITED, Ottawa Agents
Montreal Agents: T. A. MORRISON & CO., 204 St. James St.

SEE

SMYTH & RYAN

for quotations on

Lime, Stone, Cement, Sewer Pipe, Weeping Tile, Mortar Colors, Plaster, &c.

Toronto Agents for

OWEN SOUND CRUSHED STONE

Deliveries G. T. R. and C. P. R.

Head Office, 1327 Bloor Street West

Phones, June. 828,829.

Branch Yards, 53 Merton Street

Phone, North 4751 G.T.R. Belt Line

Night and Sunday calls, Phone, Parkdale, 2198.

We deliver to any point all grades

SCREENED SAND AND GRAVEL

York Sand and Gravel Co.

Tel. Beach 233 EAST TORONTO

JAS. DICKSON, Pres. GEO. T. DICKSON, Vice-Pres.

Dickson Bridge Works Co. Limited

Campbellford, Ont.

Bridge over Spanish River at Massey, Ont.

Steel Bridges, Steel Buildings Roof Trusses

and other Structural Steel

Foundry and Machine Shop in connection.

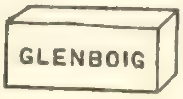
Estimates on application

The Test for Fire Brick

The only reliable test for a fire-brick is in the furnace, under severe conditions. The results **should** be as follows, and if the brand is **"Glenboig"** the results **will** be

- **No melting**
- **No cracking and splitting off**
- **High reflective power**
- **No expansion or contraction**
- **Immunity for hard knocks incidental to transit and furnace working**

"GLENBOIG" HAVE STOOD THE TEST.



Every Glenboig Brick bears the brand

Send for our literature.

MAKER'S SELLING AGENT

Alexander Gibb

13 St. John St. - MONTREAL, Que.

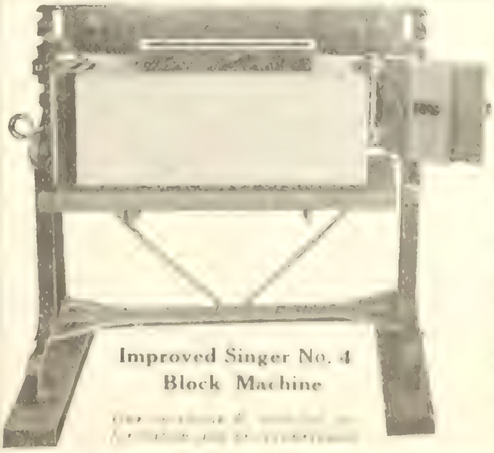
Leaded Art Glass

Have you a copy of our catalogue?
Write nearest office.

The Hobbs Mfg. Co. Limited

Factories and Warehouses:

London Toronto Montreal Winnipeg



Improved Singer No. 4 Block Machine

[illegible]

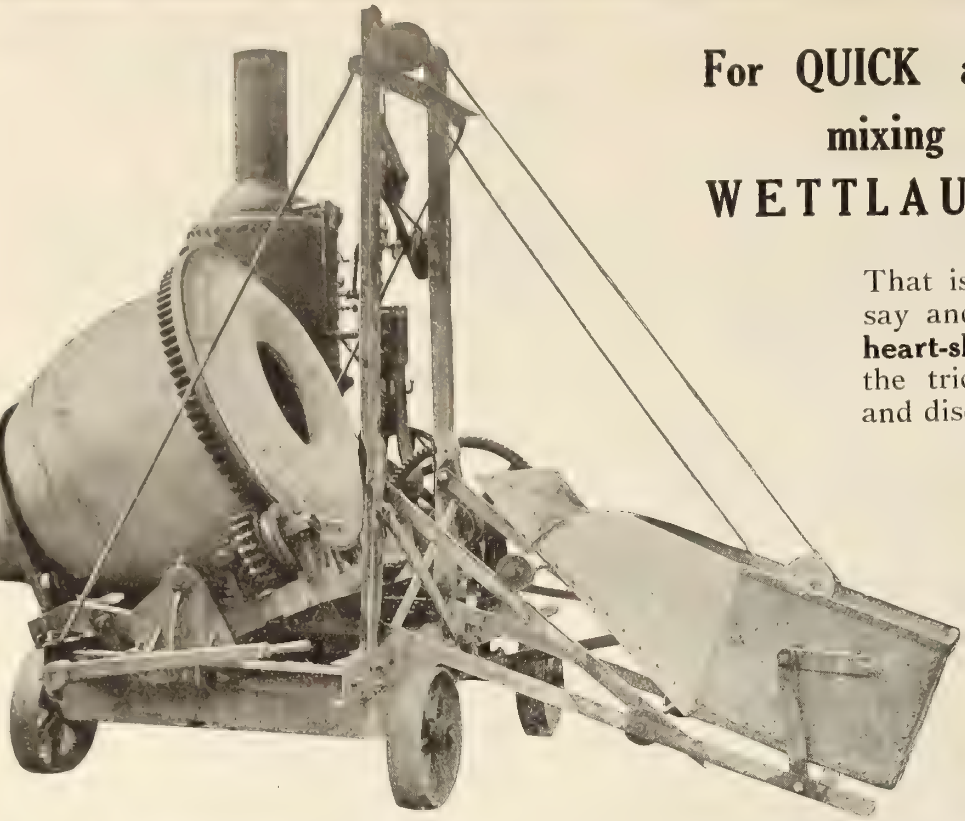
It Makes

Face Down Blocks

[illegible]

Vining Mfg. Co.

Niagara Falls, Ont.



For QUICK and THOROUGH mixing it takes a WETTLAUFER MIXER

That is what our customers say and they know. I't the **heart-shaped drum** that does the trick of speedy mixing and discharging.

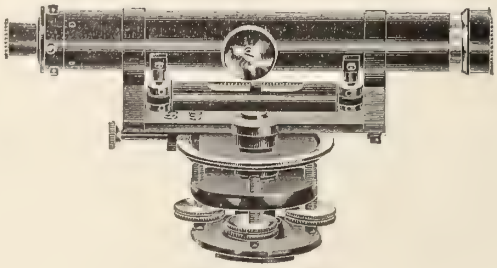
Our mixers are easily cleaned and cost nothing for repairs. Every mixer guaranteed for one year against breaks from defective material. Power costs are reduced to a minimum with the Wettlaufer mixers.

WETTLAUFER BROS., 178 Spadina Ave., TORONTO

A. R. Williams Machinery Co., 15 Dock St., St. John, N. B. W. E. Ransome, Moose Jaw, Sask

---

Surveyors' Instruments

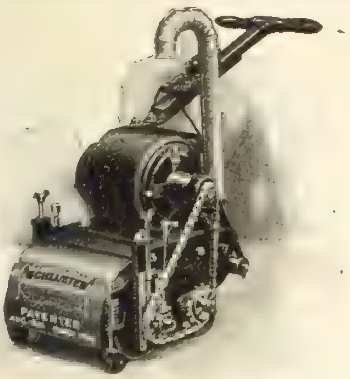


We are headquarters for instruments and all supplies and accessories necessary for the equipment of surveyors, architects and engineers. Our Repair Department is also equipped to do repair work for any make of instruments and assure you accuracy and promptness.

Toronto agents for E. R. Watts & Son, London, Eng.

Consolidated Optical Co. Ltd.

Manufacturers of Scientific Instruments



Made in three sizes:
8 x 18, 8 x 15 and 8 x 12 in. Roller

Perfect Results Are Easily Obtained By Using Schlueter Rapid Floor Surfacer

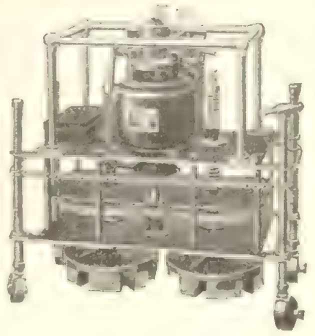
This machine is built on the only correct principle. It is guaranteed to be **The Best** machine with which to produce an even, smooth surface on any kind of large or small wood floor, old or new, hard or soft, and in all buildings: Residences, Stores, Factories, Bowling Alleys, Roller Skating Rinks, Reception and Dance Halls, Etc.

The **Schlueter** will remove all joints or warped edges, and oil, wax, lime stains, or the "muck" from skate wheels, in a most satisfactory manner.

(Earning capacity, $20.00 to $35.00 per day.)

Send for prices and **Free Trial Proposition.**

M. L. SCHLUETER, CHICAGO, ILL.
108 N. CANAL ST. N. Y. OFFICE, 1001 FLAT IRON BLDG.



Edge Roller easily adjusted to either side

Cumberland County Quarries

Red and Grey Freestone

Oakley Myers, Amherst, N.S.

Hardens with Age. Low Price. Samples and Quotations Free

JAMES BRODIE & CO.

Quarriers and Manufacturers of

Canadian Quinsy, Ebony and Stanstead Granite

Monumental Building, Curbing, Paving, etc. Rough Stock a Specialty

IBERVILLE, QUE.

ESTABLISHED 1849.

BRADSTREET'S

Offices Throughout the Civilized World.

Executive Office :
Nos. 346 and 348 Broadway, NEW YORK CITY U.S A·

THE BRADSTREET COMPANY gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying and promulgating information no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing and manufacturing concerns, and by responsible and worthy financial, judiciary and business corporations. Specific terms may be obtained by addressing the company or any of its offices. Correspondence invited.

THE BRADSTREET COMPANY.

OFFICES IN CANADA : Halifax, N.S. ; Hamilton, Ont., London, Ont. ; Montreal, Que. ; Ottawa, Ont. ; Quebec, Que. ; St. John, N.B. ; Toronto, Ont. ; Vancouver, B.C. ; Winnipeg, Man. ; Calgary, Alta. ; Edmonton, Alta.

THOS C. IRVING,
Gen. Man. Western Canada, Toronto

Geo. M. Miller & Co.

Architects

Toronto General Trust Building TORONTO

Power & Son,

Architects and Building Surveyors

Merchants Bank Chambers,
Kingston, Canada

Taylor, Hogle & Davis
(Taylor & Gordon,)

Architects

North British & Mercantile Chambers
80 St. Francois Xavier St., Montreal
Telephone Main 181

The Des Moines Hemispherical Bottom Steel Tanks and Towers

have been used and approved by nearly all leading Engineers. They are undoubtedly the most economical means of storing water at an elevation.

We have built many of these in Canada the United States and Mexico.

Estimates cheerfully furnished.

Send for Catalog No. 15

Des Moines Bridge & Iron Co.

Pittsburg, Pa., U.S.A., 945 Curry Bldg.
Des Moines, Iowa, U.S.A. 938 Tuttle St.

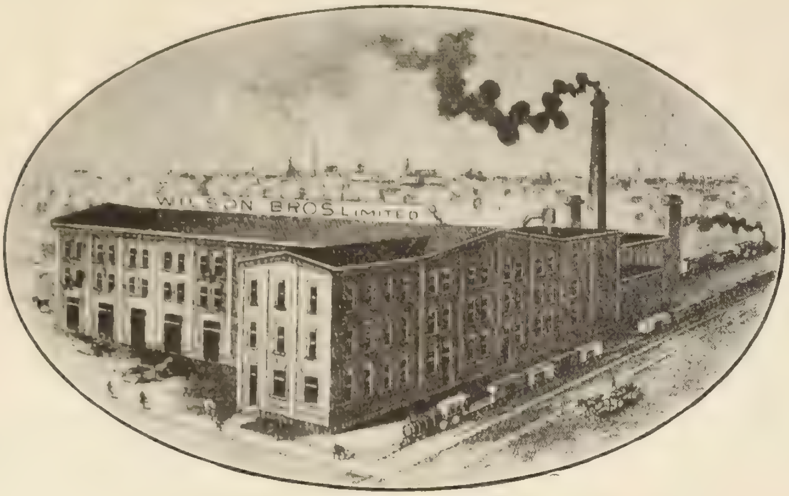
Back or Current Numbers

of any American, Canadian or Foreign Technical or Trade Journal furnished on short notice at moderate rates ; also newspapers and magazines. Government and State Reports of all kinds in stock. Clippings on special subjects furnished promptly. Information concerning any publication furnished free of charge. Magazines, books and papers of all kinds bought.

Special Subscription Price List on Request

A. W. Castellanos

263 Armstrong Ave., Jersey City, N. J., U. S. A



Hardwood Flooring and Interior Finish

"WILSON BROS. LIMITED" on flooring means a carefully kiln dried and well manufactured article. Our flooring is straightened, hollow-backed, bored, end-matched, steel polished and bundled. -:- -:- -:-

We specialize in Veneered Doors to detail.

Wilson Bros. Limited **COLLINGWOOD, ONT.**

The Mushroom System

Of Reinforced Concrete is strong, economical and durable. Based on scientific principles, every pound of steel does the work it is designed to do.

The system is fully covered by broad patents in Canada, the United States, and all civilized foreign countries.

For lists of buildings, descriptive literature and estimates, address

C. A. P. Turner, M. Am. Soc. C. E.
816 Phœnix Building, Minneapolis, Minn.

Canada Wire & Cable Co., Ltd.

Announce the Opening of their New

Wire, Cable, and Wire Rope Works

at Toronto

The Product of our Electrical Wire Department will include

Electrical Wires and Cables

in Aluminum and Copper

BARE AND INSULATED—FOR ALL PURPOSES.
GALVANIZED IRON TELEGRAPH AND TELEPHONE WIRE

The Product of our Wire Rope Department will include:

- Standard Hoisting Ropes
- Semi-Pliable, Pliable and Extra Pliable Ropes
- Improved Patented Crucible Cast Steel Hoisting Ropes
- Improved Mild Steel (Siemens-Martin) Elevator Ropes
- Transmission and Colliery Ropes
- Tiller Ropes
- Galvanized Steel Hausers
- Galvanized Strand—2, 3 and 7 wire for Guys
- Ropes to any Standard Specification

Literature ready for distribution at an early date. Write for it

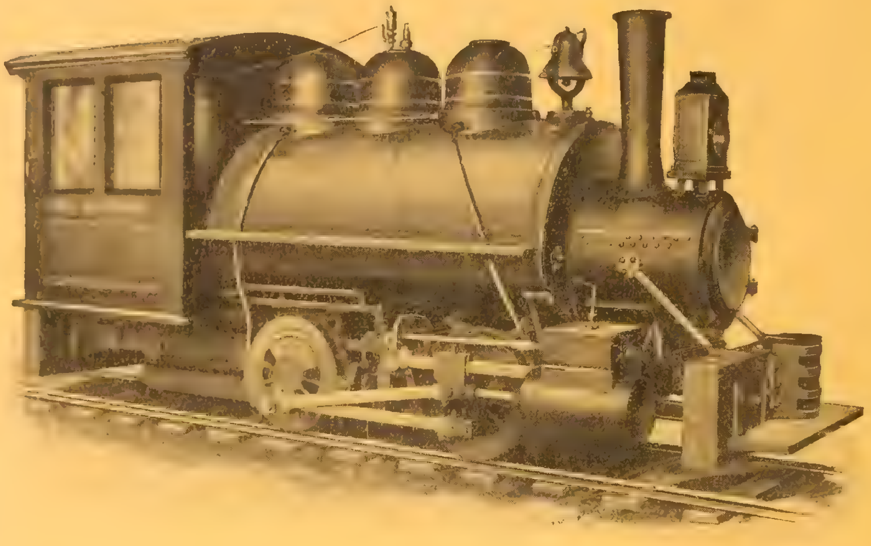
CANADA WIRE & CABLE CO.

LIMITED

Factory at
1160-70 Dundas Street
Toronto

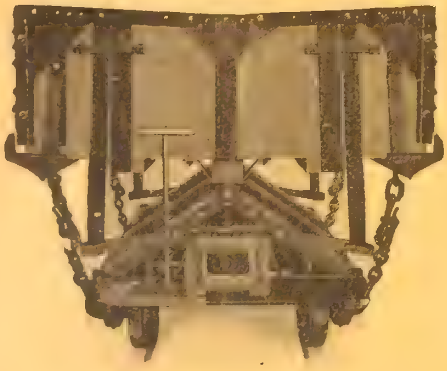
HEAD OFFICE
KENT BUILDING, 156 YONGE STREET,
TORONTO

"Davenport" LOCOMOTIVES



For Contractors' and Quarry Service

Supplied in any size and tpye for various gauges of track.



"Kilbourne & Jacobs" DUMP CARS

are stronger—longer running—safer cars—cars that will do work cheaper than any other make to be obtained. Let us tell you why—

Catalogue upon request.

F. H. Hopkins & Co.

MONTREAL

Branch Offices: Winnipeg, Man., Vancouver, B. C.
7th Floor, Bower Building, 543 Granville St.
GORMAN, CLANCEY & GRINDLEY, LTD., Calgary and Edmonton Agents